Request IR-1:

Report Tables

(a) Please provide in electronic spreadsheet format all tables and graphs with identification of the data source(s) that appear in the load forecast report and appendices, retaining all formulas and calculations.

Response IR-1:

(a) The following figures are provided in attachments and IRs as listed below:

Figure	Location
Figure 10, 13-14, 16, 51, 57-59, 60-61, 66-67, 70-73, 76, A2, C1-C6	Synapse IR 1 Attachment 1
Figures 1-3, 44, 45, 48, 52-55, 62-65	in 2023 Load Forecast Report Attachment 04 10 year Forecast Classes, tab Graphs
Figures 5-9, 11	Synapse IR-4 Attachment 1
Figures 15,17-19	Synapse IR-5 Attachment 1
Figures 20-21	Synapse IR-44 Attachment 1
Figure 22, 35	2023 LFR Attachment 03 General Intensities, tabs Shares and Intensities
Figure 23	Synapse IR-7 Attachment 1
Figure 24, 25, 33, 41	2022 LFR Attachment 01 Residential Intensities, tabs Intensities, Shares, HP and StructuralVars
Figure 26,30	Synapse IR-09 Attachment 1
Figure 27	Synapse IR-44 Attachment 2
Figure 28	Synapse IR-09 Attachment 3
Figure 31	Synapse IR-10 Attachment 1
Figure 32	Synapse IR-11 Attachment 1

Figure	Location
Figure 34	2022 LFR Attachment 02 Small General Intensities, tab Intensity
Figure 36	2022 LFR Attachment 04 10 year Forecast Classes, tab CommGrowth
Figure 37	Synapse IR-15 Attachment 1, tab Price
Figure 38	Synapse IR-16 Attachment 1
Figure 39, 42, 43	Synapse IR-18 Attachment 1
Figure 40	2023 LFR Attachment 04 10 year Forecast Classes, tab Residential
Figure 46	2023 LFR Attachment 04 10 year Forecast Classes, tab Small General
Figure 47	2023 LFR Attachment 04 10 year Forecast Classes, tab General Demand
Figure 49	2023 LFR Attachment 04 10 year Forecast Classes, tab Small Industrial
Figure 50	2023 LFR Attachment 04 10 year Forecast Classes, tab Medium Industrial
Figure 56	2023 LFR Attachment 04 10 year Forecast Classes, tab DR
Figure 68-69	Synapse IR-30 Attachment 2
Figure 74-75	Synapse IR-32 Attachment 1
Table A1	2023 LFR Attachment 04 10 year Forecast Classes, tab Sector Summary
Model data in Appendix B	2023 LFR Attachment 05-10
Regression breakdowns in Appendix B	Synapse IR-35 Attachment 1, Synapse IR-36 Attachment 1, and Synapse IR-37 Attachment 1
Appendix D	Synapse IR-43 Attachments 1, 2 and 3

1

M11108 2023 Load Forecast Synapse IR-01 Attachment 1 has been filed electronically.

Request IR-2:

Historical Sales and Energy Data (Figures 1, 3, 39-40, 44, 46-50, 52)

(a) Please provide in electronic spreadsheet format the customer sales data by rate class since 2007, on a monthly basis.

(b) Please provide in electronic spreadsheet format historical usage and customer data for electric space-heat customers since 2007 on a monthly basis.

(c) Please provide in electronic spreadsheet format system hourly load data from January 2007 through December 2022.

(d) Please provide the magnitude of unmetered historical sales by year and by category since 2007.

Response IR-2:

(a-c) Please refer to Attachment 1 filed electronically.

(d) Unmetered sales can be found in Attachment 1, tab "SalesBilled", column K. In 2022 the class made up around 0.7 percent of total sales.

M11108 2023 Load Forecast Synapse IR-02 Attachment 1 has been filed electronically.

Request IR-3:

Billed versus Accrued Sales and Regression Period (Section 4.0, p 16)

(a) The report notes that the load forecast uses "billed" sales rather than "accrued" sales. Please identify the quantitative differences between the two for the most recent available year.

(b) The report notes that it uses monthly billed sales data from January 2013 to December 2022 for the residential and commercial energy forecasts, and sales data from January 2013 to December 2022 for Small Industrial, and from January 2006 to December 2022 for Medium Industrial "to improve the fit." Please quantify the nature of the improved fit.

(c) Please identify the effect if the industrial forecast used the same period as the residential and commercial forecasts (that is, January 2013 to December 2022).

Response IR-3:

(a) Please refer to Attachment 1.

(b-c) Please refer to page 28 of the 2023 Load Forecast Report. If the shorter timeframe is used for the industrial forecast, either the economic variable loses statistical relevance as shown by a high P-values (Small Industrial) or the model loses statistical relevance as shown by a reduced adjusted R squared value (Medium Industrial).

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Accrued Sales	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Residential	4,394	4,370	4,484	4,318	4,374	4,581	4,664	4,652	4,661	4,822
Small General	249	255	272	272	280	291	298	278	291	324
General Demand	2,495	2,443	2,448	2,379	2,379	2,411	2,381	2,210	2,244	2,316
Small Industrial	248	250	257	249	246	253	262	254	257	264
Medium Industrial	494	464	477	462	467	470	460	469	476	482
Billed Sales										
Residential	4,362	4,404	4,504	4,264	4,364	4,543	4,688	4,675	4,619	4,851
Small General	248	257	272	269	277	291	298	277	290	322
General Demand	2,482	2,465	2,457	2,365	2,372	2,410	2,383	2,234	2,237	2,321
Small Industrial	249	253	257	247	245	254	261	253	257	264
Medium Industrial	492	471	476	463	463	472	461	468	476	483
Residential variance	-0.7%	0.8%	0.4%	-1.3%	-0.2%	-0.8%	0.5%	0.5%	-0.9%	0.6%
Small General variance	-0.1%	0.7%	0.1%	-1.1%	-1.0%	-0.2%	0.0%	-0.4%	-0.3%	-0.6%
General Demand variance	-0.5%	0.9%	0.3%	-0.6%	-0.3%	-0.1%	0.1%	1.1%	-0.3%	0.2%
Small Industrial variance	0.5%	1.0%	0.0%	-0.7%	-0.6%	0.4%	-0.3%	-0.3%	0.0%	0.0%
Medium Industrial variance	-0.5%	1.4%	-0.3%	0.3%	-0.8%	0.5%	0.2%	-0.2%	0.0%	0.2%

Request IR-4:

Weather Data (Section 4.2, pp 17-26)

(a) Please provide in electronic spreadsheet format the temperature data on a daily basis for January 2007 through December 2022, and the monthly HDD and CDD values used for this forecast identifying the weather station.

(b) Please provide in electronic spreadsheet format the monthly HDD and CDD data for other weather stations in Nova Scotia for the same period.

(c) Please provide the calculations used to construct the data values in Figure 7: HDD Trend from the Historic Annual HDD shown in Figure 6. Please identify the years represented on the x-axis for Figure 7.

(d) Please provide the data and calculations for Figure 8: CDD Trend. Please identify the years represented on the x-axis for Figure 8.

(e) Please provide the data and calculations behind the HDD and CDD forecast in Figure 9.

(f) Please provide the hourly peak loads and temperature data for ten years as referenced on page 23. Please explain why the period was reduced from twenty years used in the previous forecast.

(g) Please identify which years represent the 10-year averages for the bars in Figure 11. Also please provide the data used for these average calculations.

(h) Regarding the weighing of weather station data and the comparisons between the two approaches which is presented as the Mean Absolute Percentage Error (MAPE)?

Were other comparison approaches investigated? Why was the MAPE method selected?

Response IR-4:

(a) Please refer to Attachment 1, tab "DailyTemp_Shearwater", filed electronically.

(b) For the analysis of the impact of multiple weather stations on peak, 10 years of weather data were used starting 2011, please refer to Attachment 2. Other stations and time periods can be accessed directly through Environment Canada's website.[1]

(c-e) Please refer to Attachment 1, tab "HDDCDDTrend".

(f) Please refer to Attachment 1, tab "PeakTemp". A 10 year average was used in both the 2022 and 2023 load forecasts. The 2022 forecast report referenced the number of morning peaks in the past 20 years, but the forecast did not use a 20 year average in the model.

(g) Please refer to Attachment 1, tab "PeakTemp". The referenced years are indicated on the graph and represent the final year of the 10 year averages.

(h) MAPE values were produced based on regression models for each of the methods (single and multiple weather stations). If one method were to have better predictive properties it would result in a lower MAPE. No other approaches were investigated. MAPE is a common and appropriate measure of forecast accuracy.

[1] Historical Data - Climate - Environment and Climate Change Canada (weather.gc.ca)

M11108 2023 Load Forecast Synapse IR-04 Attachment 1 has been filed electronically.

M11108 2023 Load Forecast Synapse IR-04 Attachment 2 has been filed electronically.

Request IR-5:

Economic Information (Section 4.3, pp 26-31)

(a) **Please provide in electronic spreadsheet format all economic and provincial statistical data used both in developing the models and the forecasts for the historical analysis and forecast period. Cite the sources of the data. What sources other than Conference Board were considered or used?**

(b) **Please describe in detail the construction of the work-from-home variable.**

(c) **Please provide the sources and the assumptions behind the new housing completions variables. To what degree do housing completions represent replacement of existing stock?**

(d) **Regarding Figure 16 and the historical changes. Please explain the increases in population for 2022, 2023 and 2024 and how that relates to customer numbers and housing completions. What are the comparable changes on a percentage basis? What is the forecast for the population changes during the forecast period?**

(e) **Please discuss why non-manufacturing gross domestic product and non-manufacturing employment continue to be used for the commercial models. Were other drivers considered? Why were they not chosen?**

(f) **Please discuss why manufacturing GDP and manufacturing employment were chosen for the industrial models. Were other drivers considered? Why were they not chosen?**

(g) **What consideration if any was given to labour shortages or increased automation for the industrial sector?**

(h) What would be the effects on the industrial forecast if 10 years were used for the regression?

(i) Please provide the inflation adjustments used to convert to constant dollars.

(j) Regarding economic forecasts, identify the scenario/case used for this analysis and the reasons for choosing it.

(k) Please indicate any other economic forecasts that are available and indicate why they were not chosen. For example, the use of major bank forecasts for the near term.

Response IR-5:

a) Please refer to Attachment 1. Data from the Conference Board of Canada was used in the model; data from the major banks was used to compare the reasonability of the Conference Board data for years 2023 and 2024; and median income from Statistics Canada was used to compare with the household compensation indicator.

b) In the residential class, the COVID-19 pandemic work-from-home variable is a pseudo-binary variable of 1 starting in July 2020, 0.5 in October 2020, 0.43 in January 2022 and 0.36 in July 2022-2033. In the commercial class the variable is also a pseudo-binary of 1 starting in March 2020, 0.75 in September 2021, 0.38 in June 2022 and 0.19 in January 2023-2033. While the variable for the residential class adds load (the coefficient is positive), the variable in the commercial class reduces load (the coefficient is negative).

c) The new housing completion forecast is provided by Conference Board of Canada. Housing completions refers to new units, and excludes renovations, as defined at: https://www.cmhc-schl.gc.ca/en/professionals/housing-markets-data-and-

research/housing-research/surveys/methods/methodologies-starts-completions-market-absorption-survey.

d) Population increased in 2022 due mainly to immigration from other provinces and from outside the country (immigration represented a change of +13816 according to StatCan Table: 17-10-0140-01) and this trend is expected to continue into 2023 and 2024. The increase in population is the driver behind increased housing completions, as new residents will require new housing. Population and customer count (based on housing completions) are shown in the following table:

Year	Population (000s)	Change	Customer Count	Change
2021	989		482,771	
2022	1,015	2.6%	488,654	1.2%
2023	1,042	2.7%	494,831	1.3%
2024	1,057	1.4%	500,613	1.2%
2025	1,069	1.2%	506,194	1.1%
2026	1,080	1.0%	511,451	1.0%
2027	1,089	0.9%	516,330	1.0%
2028	1,098	0.8%	520,803	0.9%
2029	1,106	0.7%	524,901	0.8%
2030	1,114	0.7%	528,657	0.7%
2031	1,121	0.7%	532,100	0.7%
2032	1,128	0.6%	535,259	0.6%
2033	1,134	0.6%	538,157	0.5%

e) The non-manufacturing GDP and non-manufacturing employment variables have been used in previous forecasts and provided consistent models with good model fit statistics. Unless there is reason to believe they are no longer relevant (poor model statistics, unusual results) other variables are not considered.

f) GDP and manufacturing employment were chosen for the industrial models as they provide good overall model statistics. Other variables such as manufacturing GDP and exports were checked but provided worse model statistics or inconsistent coefficients.

g) Labour shortages and increased automation were not considered explicitly, but any significant factors that would impact the employment or GDP variables would be included in the underlying forecast provided by the Conference Board of Canada.

h) A 10 year period was used for the Small Industrial model. If a 10 year period is used for the Medium Industrial model the ManEmp variable loses some relevance, with the T-Stat dropping from 16.46 to 3.81, and the adjusted R squared dropping from 0.72 to 0.37. The impact to the forecast would be as follows:

Year	Medium Industrial (GWh, current)	Medium Industrial (GWh, 10yr)
2023	479	472
2024	479	472
2025	478	472
2026	477	471
2027	476	471
2028	477	471
2029	479	472
2030	481	473
2031	482	474
2032	484	474
2033	486	475

i) The annual CPI is used to adjust to constant dollars. Please refer to Attachment 1, column R on the CBoC tab.

j) The economic forecast used is not based on a certain scenario but rather on Conference Board of Canada's view of the most likely future.

k) Bank forecasts are checked for discrepancies in the near-term GDP and employment forecasts, and are provided in Attachment 1.

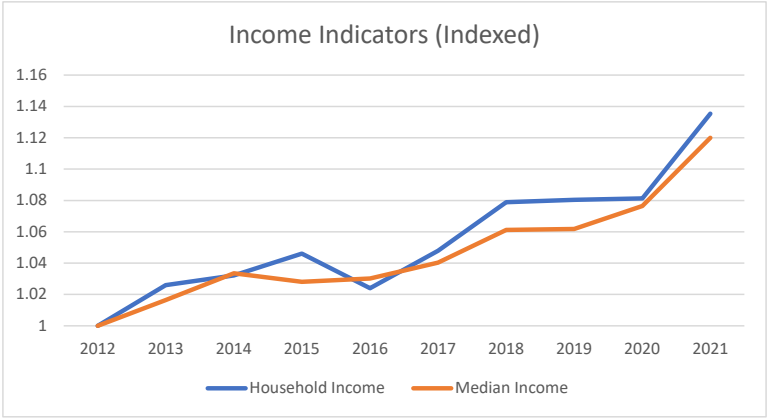
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	CBoC 20 Year Forecast (Dec 2022)								CBoC 5 Year Forecast (Feb 2023) + 20 year forecast								Calculated			
CBoC Description	(Average Aggregation) Housing Completions, Singles, Nova Scotia (Thousands ('000s))	(Average Aggregation) Housing Completions, Multiples, Nova Scotia (Thousands ('000s))	(Average Aggregation) Current accounts - Households, Compensation of employees; Nova Scotia (Millions $)	(Average Aggregation) Real Gross Domestic Product (GDP) at Basic Prices by Industry, All Industries, Nova Scotia (Millions, Chained $ 2012)	(Average Aggregation) Real Gross Domestic Product (GDP) at Basic Prices by Industry, Manufacturing, Nova Scotia (Millions, Chained $ 2012)	(Average Aggregation) Employment, Total, Nova Scotia (Thousands ('000s))	(Average Aggregation) Employment, Nova Scotia, Manufacturing (Thousands ('000s))	(Average Aggregation) Provincial Consumer Price Index, Nova Scotia (2002=1.0)	(Average Aggregation) Housing Completions, Singles, Nova Scotia (Thousands ('000s))	(Average Aggregation) Housing Completions, Multiples, Nova Scotia (Thousands ('000s))	(Average Aggregation) Current accounts - Households, Compensation of employees; Nova Scotia (Millions $)	(Average Aggregation) Real Gross Domestic Product (GDP) at Basic Prices by Industry, All Industries, Nova Scotia (Millions, Chained $ 2012)	(Average Aggregation) Real Gross Domestic Product (GDP) at Basic Prices by Industry, Manufacturing, Nova Scotia (Millions, Chained $ 2012)	(Average Aggregation) Employment, Total, Nova Scotia (Thousands ('000s))	(Average Aggregation) Employment, Nova Scotia, Manufacturing (Thousands ('000s))	(Average Aggregation) Provincial Consumer Price Index, Nova Scotia (2002=1.0)	New Construcion	Non-manufacturing GDP	Non-manufacturing Employment	Household Compensation - real ($2002)
Mnemonic	RIHSCS	RIHMCS	RYHCMPS	RQTOS	RQMANS	RLEMS	RLEMMANS	RPCPIS	RIHSCS	RIHMCS	RYHCMPS	RQTOS	RQMANS	RLEMS	RLEMMANS	RPCPIS				
2006							39.1								38.8					
2007							41.2								40.3					
2008							39.9								38.7					
2009							35.6								34.4					
2010							32.6								33.1					
2011							32.7								33.3					
2012							32.8								33.7					
2013	2.0	2.7	21706.0	34383.8	2503.8	448.9	31.0	1.3	2.0	2.7	21706.0	34383.8	2503.8	455.4	31.3	1.3	4660	31880	424	17150
2014	1.5	1.8	22219.0	34747.2	2397.2	442.3	30.0	1.3	1.5	1.8	22219.0	34747.2	2397.2	447.9	29.3	1.3	3260	32350	419	17254
2015	1.4	1.8	22616.0	35013.4	2442.5	439.3	28.6	1.3	1.4	1.8	22616.0	35013.4	2442.5	444.0	27.8	1.3	3163	32571	416	17488
2016	1.4	1.9	22405.0	35489.1	2461.7	439.3	29.4	1.3	1.4	1.9	22405.0	35489.1	2461.7	443.2	28.5	1.3	3318	33027	415	17118
2017	1.6	2.1	23189.0	36213.8	2490.4	442.7	30.5	1.3	1.6	2.1	23189.0	36213.8	2490.4	447.5	29.9	1.3	3689	33723	418	17517
2018	1.8	2.2	24407.0	36841.3	2577.3	450.9	31.7	1.4	1.8	2.2	24407.0	36841.3	2577.3	452.1	31.8	1.4	4036	34264	420	18036
2019	1.8	2.3	24830.0	37907.0	2736.6	461.3	31.9	1.4	1.8	2.3	24830.0	38087.2	2735.7	464.7	33.4	1.4	4183	35352	431	18061
2020	1.9	2.5	24895.0	36950.1	2649.5	439.8	31.8	1.4	1.9	2.5	24929.0	36734.3	2600.4	443.3	32.8	1.4	4365	34134	410	18077
2021	2.1	2.6	26647.1	39082.3	2848.2	463.5	32.6	1.4	2.1	2.6	27187.0	38999.5	2808.8	468.1	32.8	1.4	4614	36191	435	18945
2022	2.2	2.8	28639.6	40119.0	2831.8	478.2	32.8	1.5	2.2	2.4	29586.3	39588.1	2768.4	484.8	34.1	1.5	4560	36820	451	19174
2023	2.2	4.0	30104.6	40558.6	2833.9	480.4	32.9	1.6	2.2	4.0	30639.4	39738.5	2681.9	488.2	33.4	1.6	6177	37057	455	19133
2024	2.0	3.8	31293.4	41556.0	2939.0	484.4	32.9	1.6	2.0	3.8	31960.6	40554.2	2779.8	492.4	33.5	1.6	5782	37774	459	19500
2025	1.9	3.7	32342.4	42157.0	3034.3	486.3	33.0	1.7	1.9	3.7	33174.8	41406.3	2898.4	494.3	33.4	1.7	5581	38508	461	19839
2026	1.7	3.6	33251.6	42727.7	3126.5	487.4	33.2	1.7	1.7	3.6	34294.6	42086.4	2996.2	495.5	33.2	1.7	5257	39090	462	20101
2027	1.5	3.4	34129.0	43321.0	3217.3	488.4	33.3	1.7	1.5	3.4	35396.0	42728.3	3091.0	496.4	33.1	1.7	4878	39637	463	20337
2028	1.4	3.1	35062.4	43871.7	3303.4	490.5	33.5	1.8	1.4	3.1	36364.1	43271.5	3173.7	498.5	33.3	1.8	4473	40098	465	20481
2029	1.2	2.9	36076.4	44476.7	3394.9	493.1	33.7	1.8	1.2	2.9	37415.7	43868.2	3261.6	501.2	33.5	1.8	4098	40607	468	20657
2030	1.1	2.7	37120.1	45095.2	3487.4	495.7	33.9	1.8	1.1	2.7	38498.1	44478.3	3350.4	503.9	33.7	1.8	3756	41128	470	20834
2031	1.0	2.5	38194.8	45726.1	3582.5	498.4	34.1	1.9	1.0	2.5	39612.7	45100.5	3441.9	506.6	33.9	1.9	3444	41659	473	21014
2032	0.8	2.3	39302.3	46371.1	3679.7	501.1	34.4	1.9	0.8	2.3	40761.3	45736.7	3535.2	509.4	34.2	1.9	3158	42201	475	21196
2033	0.8	2.1	40444.5	47030.1	3779.1	504.7	34.7	2.0	0.8	2.1	41946.0	46386.7	3630.7	513.0	34.5	2.0	2898	42756	479	21381

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Bank	Source	GDP		Emp		Housing		CPI	
		2023	2024	2023	2024	2023	2024	2023	2024
BMO	Provincial Economic Outlook, Jan 2023	1.0%	1.1%	0.8%	0.5%	7000	6500	4.1%	2.5%
RBC	Provincial Outlook, Dec 2022	1.2%	1.5%	0.3%	1.1%	7300	8000	3.6%	2.4%
TD	Provincial Economic Forecast, Dec 2022	0.8%	0.7%	0.2%	-0.3%	5500	5300		
National Bank	Monthly Economic Monitor, Nov 2022	0.6%	1.1%	0.5%	0.8%	4500	4500	2.6%	2.2%
Scotiabank	Provincial Analysis, Dec 2022	0.7%	1.2%	0.9%	1.3%	4500	4400	4.7%	2.2%

	CPI (CBoC 2	Household	Household	Household	Median en	Median en	Median employment income (indexed 2012)
2012	1.250833	20910	16716.86	1	28100	22465.02	1
2013	1.265667	21706	17149.86	1.025902	28900	22833.82	1.016416
2014	1.28775	22218.99	17254.11	1.032139	29900	23218.79	1.033553
2015	1.29325	22615.99	17487.71	1.046113	29870	23096.85	1.028125
2016	1.308833	22405	17118.3	1.024014	30290	23142.75	1.030168
2017	1.323833	23189	17516.56	1.047838	30940	23371.52	1.040352
2018	1.35325	24407	18035.84	1.078901	32260	23838.91	1.061157
2019	1.37475	24830.01	18061.48	1.080435	32790	23851.61	1.061722
2020	1.379083	24929	18076.5	1.081334	33350	24182.73	1.076461
2021	1.432421	27187	18979.76	1.135366	36040	25160.2	1.119972



Request IR-6:

Residential End-Use Intensity Trends (Section 4.4, pp 32-51)

(a) Please provide in electronic spreadsheet format the end-use data in the form of saturations and efficiencies from NRCan and U.S. EIA used for the residential and commercial models.

(b) Please identify specifically which of that data was used in the SAE modeling and any adjustments, transformations, etc. that were made in that process.

(c) Please identify the adjustments that were made "so that the resulting intensities are consistent with NRCan-reported end-use sales and actual average use derived from NS Power billing data." [page 32, lines 13-15]

Response IR-6:

a) Please refer to Attachment 1 for the residential data from NRCan and Attachment 2 for the commercial data from NRCan. The EIA data can be found in 2023 Load Forecast Report Attachment 1 Residential Intensities, "EIAData" tab, 2023 Load Forecast Report Attachment 2 Small General Intensities, "EIAData" tab, and 2023 Load Forecast Report Attachment 3 General Intensities, "EIAData" tab.

b) Information from the following tables in Attachment 1 is used to populate the tab titled "NRCanDetail" in the 2023 Load Forecast Report Attachment 1 Residential Intensities, filed electronically:

End Use	Consumption Data	End-Use Stock Data
Lighting	Table 3	Assumed 100% of households have lighting
Room and central air-conditioning	Table 4	Table 27
Electric furnace and heat pumps	Table 9	Table 21
Electric hot water	Table 10	Table 28
Refrigerator, freezer, dishwasher, clothes washer, clothes dryer, range, other appliances	Table 13	Table 31

End uses not included in the NRCan data are estimated from EIA data or survey information where available.

Consumption information from the following tables in Attachment 2 is used to populate the tab titled "NRCanDetail" in 2023 LFR Attachment 2 Small General Intensities and 2023 LFR Attachment 3 General Intensities:

End Use	Consumption Data
Space Heat	Table 24
Electric Hot Water	Table 26
Auxiliary Equipment	Table 28
Auxiliary Motors	Table 30
Lighting	Table 31
Space Cooling	Table 32
Outdoor Lighting	Table 34
Total Consumption	Table 1

c) Please refer to 2023 LFR Attachment 1 Residential Intensities. On the tab labeled "Calibration," individual end-use consumption based on NRCan data is added together to give a household view of energy consumption and is compared to NS Power's billing records for residential customer energy usage. A scaling factor is calculated to align the two data sets. This scaling factor is then applied to the annual end-use intensity values found on the tab titled "Intensities".

Residential Sector
List of Tables

Nova Scotia[1]

Secondary Energy Use and GHG Emissions Summary Tables

Table 1: Secondary Energy Use and GHG Emissions by Energy Source

Table 2: Secondary Energy Use and GHG Emissions by End-Use

Detailed Tables

Seconday Energy Use and GHG Emissions by End-Use

Table 3: Lighting Secondary Energy Use and GHG Emissions

Table 4: Space Cooling Secondary Energy Use and GHG Emissions by Cooling System Type

Table 5: Space Heating Secondary Energy Use and GHG Emissions by Energy Source

Table 6: Space Heating Secondary Energy Use and GHG Emissions by Building Type

Table 7: Space Heating Secondary Energy Use and GHG Emissions by Vintage

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1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Residential Sector

Nova Scotia[1]

Table 1: Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use (PJ)	**41.8**	**44.1**	**45.3**	**42.3**	**40.2**	**38.4**	**39.1**	**44.9**	**45.2**	**46.2**	**46.3**	**49.5**	**44.1**	**43.0**	**40.9**	**42.1**	**38.1**	**38.9**	**41.1**	**41.2**
Energy Use by Energy Source (PJ)																				
Electricity	13.3	14.3	14.8	14.5	14.8	14.9	14.4	15.0	15.2	15.3	15.0	15.4	15.1	15.9	15.8	15.8	15.9	16.4	16.9	17.1
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.3
Heating Oil	22.5	24.2	25.2	23.0	20.0	17.7	18.6	22.5	22.7	22.7	23.9	26.4	21.6	18.8	17.0	17.1	13.9	14.5	16.1	16.2
Other[2]	0.5	0.7	0.8	0.8	0.7	0.9	1.0	0.9	1.1	1.1	1.1	0.8	0.6	0.5	0.5	0.6	0.5	0.5	0.1	0.1
Wood	5.5	4.9	4.6	4.0	4.8	5.0	5.1	6.5	6.3	6.8	6.2	6.7	6.6	7.6	7.4	8.3	7.5	7.3	7.7	7.5
Shares (%)																				
Electricity	31.8	32.4	32.6	34.2	36.8	38.6	36.9	33.4	33.5	33.0	32.4	31.2	34.3	36.9	38.6	37.6	41.7	42.2	41.2	41.4
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.8
Heating Oil	53.8	54.7	55.6	54.4	49.6	46.0	47.6	50.1	50.2	49.1	51.6	53.4	49.0	43.8	41.7	40.7	36.6	37.2	39.1	39.3
Other[2]	1.3	1.7	1.7	1.9	1.7	2.4	2.5	2.1	2.3	2.3	2.3	1.6	1.4	1.2	1.1	1.3	1.3	1.2	0.2	0.2
Wood	13.1	11.2	10.1	9.5	11.9	13.0	12.9	14.5	14.0	14.7	13.3	13.6	15.0	17.7	18.1	19.8	19.8	18.7	18.8	18.3
Activity																				
Total Floor Space (million m^2)	46.4	47.1	47.9	48.9	49.8	50.7	51.6	52.5	53.5	54.2	55.1	55.9	56.7	57.6	58.2	58.9	59.4	60.6	61.3	62.1
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/m^2)	**0.90**	**0.94**	**0.95**	**0.87**	**0.81**	**0.76**	**0.76**	**0.85**	**0.85**	**0.85**	**0.84**	**0.89**	**0.78**	**0.75**	**0.70**	**0.72**	**0.64**	**0.64**	**0.67**	**0.66**
Energy Intensity (GJ/household)	**116.4**	**121.7**	**123.6**	**114.1**	**107.6**	**102.0**	**103.1**	**117.2**	**116.6**	**117.8**	**118.9**	**126.6**	**112.0**	**109.3**	**102.9**	**105.2**	**94.7**	**95.7**	**100.0**	**99.2**
Total GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.8**	**1.9**	**1.9**	**1.8**	**1.6**	**1.4**	**1.5**	**1.8**	**1.8**	**1.9**	**1.9**	**2.1**	**1.7**	**1.6**	**1.4**	**1.5**	**1.2**	**1.2**	**1.3**	**1.3**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	1.6	1.7	1.8	1.6	1.4	1.3	1.3	1.6	1.6	1.6	1.7	1.9	1.5	1.3	1.2	1.2	1.0	1.0	1.1	1.1
Other[2]	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Shares (%)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.6	0.3	0.4	0.6	0.7	0.8	1.0	1.0	1.1	1.2
Heating Oil	90.8	91.4	92.1	91.9	90.2	87.8	88.1	88.4	88.3	86.9	88.5	89.8	88.5	85.9	85.0	83.4	81.9	82.9	85.0	85.3
Other[1]	1.9	2.4	2.4	2.7	2.7	4.0	4.0	3.2	3.5	3.5	3.4	2.3	2.2	2.1	2.0	2.4	2.5	2.3	0.4	0.3
Wood	7.4	6.2	5.5	5.3	7.1	8.2	7.9	8.5	8.2	8.6	7.6	7.6	9.0	11.5	12.2	13.4	14.7	13.8	13.5	13.2
GHG Intensity (tonne/TJ)	**41.9**	**42.4**	**42.8**	**41.9**	**39.0**	**37.1**	**38.4**	**40.2**	**40.3**	**40.1**	**41.3**	**42.2**	**39.3**	**36.2**	**34.8**	**34.6**	**31.7**	**31.8**	**32.6**	**32.6**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]

Table 2: Secondary Energy Use and GHG Emissions by End-Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use (PJ)	**41.8**	**44.1**	**45.3**	**42.3**	**40.2**	**38.4**	**39.1**	**44.9**	**45.2**	**46.2**	**46.3**	**49.5**	**44.1**	**43.0**	**40.9**	**42.1**	**38.1**	**38.9**	**41.1**	**41.2**
Energy Use by End-Use (PJ)																				
Space Heating	27.4	28.7	29.5	27.4	26.1	24.3	24.3	28.5	30.3	31.5	30.7	33.6	28.5	28.0	27.2	28.7	24.8	25.7	26.6	26.9
Water Heating	7.8	8.4	8.5	7.8	7.1	7.0	7.6	8.8	7.8	7.6	8.4	8.6	8.0	7.2	6.2	5.9	5.5	5.4	6.1	6.0
Appliances	5.0	5.4	5.5	5.3	5.3	5.5	5.6	5.9	5.5	5.5	5.6	5.7	5.9	6.1	5.9	5.8	6.1	6.1	6.6	6.6
Lighting	1.6	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.4	1.5	1.5	1.6	1.5
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2
Shares (%)																				
Space Heating	65.4	65.0	65.2	64.8	64.9	63.2	62.0	63.5	67.0	68.1	66.2	67.9	64.7	65.1	66.5	68.2	65.1	66.1	64.7	65.2
Water Heating	18.7	19.0	18.8	18.5	17.7	18.1	19.5	19.7	17.3	16.5	18.1	17.3	18.1	16.6	15.1	14.1	14.6	13.8	14.8	14.5
Appliances	12.0	12.1	12.1	12.5	13.2	14.3	14.2	13.0	12.2	11.9	12.1	11.6	13.3	14.2	14.5	13.9	16.0	15.8	16.0	16.0
Lighting	3.8	3.8	3.8	4.0	4.2	4.3	4.1	3.6	3.4	3.2	3.3	3.0	3.5	3.6	3.6	3.4	3.9	3.8	3.8	3.7
Space Cooling	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.4	0.4	0.3	0.4	0.5	0.5	0.7	0.5
Activity																				
Total Floor Space (million m^2)	46.4	47.1	47.9	48.9	49.8	50.7	51.6	52.5	53.5	54.2	55.1	55.9	56.7	57.6	58.2	58.9	59.4	60.6	61.3	62.1
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/m^2)	**0.90**	**0.94**	**0.95**	**0.87**	**0.81**	**0.76**	**0.76**	**0.85**	**0.85**	**0.85**	**0.84**	**0.89**	**0.78**	**0.75**	**0.70**	**0.72**	**0.64**	**0.64**	**0.67**	**0.66**
Energy Intensity (GJ/household)	**116.4**	**121.7**	**123.6**	**114.1**	**107.6**	**102.0**	**103.1**	**117.2**	**116.6**	**117.8**	**118.9**	**126.6**	**112.0**	**109.3**	**102.9**	**105.2**	**94.7**	**95.7**	**100.0**	**99.2**
Total GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.8**	**1.9**	**1.9**	**1.8**	**1.6**	**1.4**	**1.5**	**1.8**	**1.8**	**1.9**	**1.9**	**2.1**	**1.7**	**1.6**	**1.4**	**1.5**	**1.2**	**1.2**	**1.3**	**1.3**
GHG Emissions by End-Use (Mt of CO_2e)																				
Space Heating	1.4	1.5	1.5	1.4	1.3	1.1	1.2	1.4	1.5	1.5	1.5	1.7	1.3	1.2	1.2	1.2	1.0	1.0	1.1	1.1
Water Heating	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	79.0	78.7	79.0	79.0	79.9	79.0	77.0	76.6	79.8	80.5	78.4	79.4	77.7	79.1	81.3	82.6	81.7	82.7	81.1	81.6
Water Heating	21.0	21.3	21.0	21.0	20.1	21.0	23.0	23.4	20.2	19.4	21.5	20.5	22.2	20.8	18.6	17.3	18.2	17.1	18.7	18.2
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**41.9**	**42.4**	**42.8**	**41.9**	**39.0**	**37.1**	**38.4**	**40.2**	**40.3**	**40.1**	**41.3**	**42.2**	**39.3**	**36.2**	**34.8**	**34.6**	**31.7**	**31.8**	**32.6**	**32.6**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

Residential Sector

Nova Scotia[1]

Table 3: Lighting Secondary Energy Use and GHG Emissions

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Lighting Energy Use[2] **(PJ)**	**1.6**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.6**	**1.6**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**1.6**	**1.5**	**1.4**	**1.5**	**1.5**	**1.6**	**1.5**
Activity																				
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/household)	**4.4**	**4.7**	**4.7**	**4.6**	**4.5**	**4.4**	**4.3**	**4.3**	**3.9**	**3.8**	**3.9**	**3.8**	**3.9**	**4.0**	**3.7**	**3.6**	**3.6**	**3.6**	**3.8**	**3.7**
Total Lighting GHG Emissions Excluding Electricity[2]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Heat Loss (PJ)	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.6**	**0.6**	**0.6**	**0.7**	**0.6**	**0.6**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.6**	**0.7**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) Lighting consumes only electricity.

Residential Sector

Nova Scotia[1]

Table 4: Space Cooling Secondary Energy Use and GHG Emissions by Cooling System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Cooling Energy Use[2] (PJ)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.2**
Energy Use by Cooling System Type (PJ)																				
Room	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Room	60.3	56.0	55.3	59.7	68.2	64.9	65.2	62.0	64.6	61.9	61.4	55.8	54.7	54.7	54.3	54.7	53.9	53.8	53.7	53.7
Central	39.7	44.0	44.7	40.3	31.8	35.1	34.8	38.0	35.4	38.1	38.6	44.2	45.3	45.3	45.7	45.3	46.1	46.2	46.3	46.3
Activity																				
Cooled Floor Space (million m^2)	3.8	2.8	3.3	3.9	4.1	4.4	5.0	6.7	6.6	7.4	8.4	9.1	10.1	10.8	11.5	7.5	13.0	13.7	14.5	15.2
Energy Intensity (MJ/m^2)	**7.3**	**11.7**	**9.2**	**9.8**	**7.2**	**14.2**	**9.9**	**5.4**	**12.2**	**12.2**	**16.6**	**9.7**	**16.7**	**15.0**	**12.0**	**22.7**	**14.5**	**13.6**	**20.1**	**13.2**
Total Space Cooling GHG Emissions Excluding Electricity[2] (Mt of CO_2e)	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) Space cooling consumes only electricity.

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Table 5: Space Heating Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating Energy Use (PJ)	**27.4**	**28.7**	**29.5**	**27.4**	**26.1**	**24.3**	**24.3**	**28.5**	**30.3**	**31.5**	**30.7**	**33.6**	**28.5**	**28.0**	**27.2**	**28.7**	**24.8**	**25.7**	**26.6**	**26.9**
Energy Use by Energy Source (PJ)																				
Electricity	4.4	4.7	5.0	5.0	5.3	5.2	4.7	4.9	5.7	5.9	5.5	5.9	5.3	5.8	6.1	6.3	6.0	6.5	6.3	6.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Heating Oil	17.5	18.7	19.6	17.9	15.6	13.6	14.0	16.7	17.7	17.8	18.3	20.6	16.3	14.5	13.5	13.7	11.0	11.6	12.7	12.9
Other[2]	0.5	0.7	0.7	0.7	0.6	0.9	0.9	0.9	1.0	1.0	1.0	0.8	0.6	0.5	0.4	0.5	0.5	0.4	0.1	0.1
Wood	5.0	4.5	4.2	3.7	4.5	4.6	4.7	6.0	5.9	6.4	5.8	6.3	6.2	7.1	7.0	7.9	7.1	6.9	7.3	7.1
Shares (%)																				
Electricity	15.9	16.6	17.0	18.3	20.5	21.3	19.4	17.2	18.7	18.8	17.8	17.5	18.6	20.6	22.5	22.1	24.2	25.4	23.7	24.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.7	0.4	0.4	0.6	0.7	0.7	0.8	0.9	1.0	1.0
Heating Oil	63.9	65.2	66.3	65.3	59.9	56.0	57.5	58.7	58.3	56.5	59.6	61.1	57.3	51.6	49.5	47.8	44.4	45.3	47.6	47.9
Other[2]	1.8	2.4	2.4	2.7	2.5	3.6	3.8	3.1	3.3	3.2	3.2	2.2	2.1	1.8	1.6	1.9	1.9	1.7	0.3	0.3
Wood	18.4	15.8	14.3	13.7	17.1	19.1	19.3	21.0	19.6	20.4	18.8	18.8	21.7	25.4	25.7	27.5	28.7	26.8	27.4	26.6
Activity																				
Total Floor Space (million m^2)	46.4	47.1	47.9	48.9	49.8	50.7	51.6	52.5	53.5	54.2	55.1	55.9	56.7	57.6	58.2	58.9	59.4	60.6	61.3	62.1
Energy Intensity (GJ/m^2)	**0.59**	**0.61**	**0.62**	**0.56**	**0.52**	**0.48**	**0.47**	**0.54**	**0.57**	**0.58**	**0.56**	**0.60**	**0.50**	**0.49**	**0.47**	**0.49**	**0.42**	**0.42**	**0.43**	**0.43**
Total Space Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.4**	**1.5**	**1.5**	**1.4**	**1.3**	**1.1**	**1.2**	**1.4**	**1.5**	**1.5**	**1.5**	**1.7**	**1.3**	**1.2**	**1.2**	**1.2**	**1.0**	**1.0**	**1.1**	**1.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	1.2	1.3	1.4	1.3	1.1	1.0	1.0	1.2	1.3	1.3	1.3	1.5	1.2	1.0	1.0	1.0	0.8	0.8	0.9	0.9
Other[2]	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
GHG Intensity (tonne/TJ)	**50.6**	**51.4**	**51.8**	**51.2**	**48.0**	**46.4**	**47.6**	**48.5**	**48.0**	**47.4**	**49.0**	**49.3**	**47.2**	**44.0**	**42.5**	**41.9**	**39.8**	**39.8**	**40.9**	**40.8**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Heat Gains (PJ)	**2.5**	**2.7**	**2.9**	**2.8**	**2.9**	**2.7**	**2.4**	**2.5**	**2.8**	**2.9**	**2.6**	**2.8**	**2.5**	**2.7**	**2.9**	**3.0**	**2.9**	**3.2**	**3.1**	**3.3**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

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Table 6: Space Heating Secondary Energy Use and GHG Emissions by Building Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating Energy Use (PJ)	**27.4**	**28.7**	**29.5**	**27.4**	**26.1**	**24.3**	**24.3**	**28.5**	**30.3**	**31.5**	**30.7**	**33.6**	**28.5**	**28.0**	**27.2**	**28.7**	**24.8**	**25.7**	**26.6**	**26.9**
Energy Use by Building Type (PJ)																				
Single Detached	22.0	23.0	23.7	22.0	20.9	19.4	19.4	22.7	24.2	25.1	24.4	26.8	22.7	22.2	21.6	22.7	19.6	20.2	20.9	21.1
Single Attached	1.7	1.7	1.8	1.7	1.6	1.5	1.5	1.8	1.9	2.0	2.0	2.2	1.9	1.9	1.8	2.0	1.7	1.8	1.9	1.9
Apartments	2.5	2.6	2.7	2.5	2.4	2.2	2.3	2.7	2.8	3.0	2.9	3.2	2.7	2.7	2.6	2.8	2.4	2.6	2.7	2.7
Mobile Homes	1.3	1.3	1.4	1.3	1.2	1.1	1.1	1.3	1.4	1.4	1.4	1.5	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.2
Shares (%)																				
Single Detached	80.3	80.3	80.3	80.3	80.1	80.0	79.9	79.7	79.7	79.7	79.7	79.7	79.6	79.4	79.3	79.2	79.0	78.8	78.7	78.6
Single Attached	6.1	6.1	6.1	6.1	6.2	6.3	6.3	6.3	6.4	6.4	6.4	6.4	6.5	6.7	6.7	6.8	6.9	7.0	7.0	7.1
Apartments	9.0	9.0	9.0	9.0	9.2	9.2	9.3	9.4	9.4	9.4	9.4	9.4	9.4	9.6	9.6	9.7	9.8	9.9	10.0	10.0
Mobile Homes	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.3
Activity																				
Total Floor Space (million m^2)	46.4	47.1	47.9	48.9	49.8	50.7	51.6	52.5	53.5	54.2	55.1	55.9	56.7	57.6	58.2	58.9	59.4	60.6	61.3	62.1
Energy Intensity (GJ/m^2)	**0.59**	**0.61**	**0.62**	**0.56**	**0.52**	**0.48**	**0.47**	**0.54**	**0.57**	**0.58**	**0.56**	**0.60**	**0.50**	**0.49**	**0.47**	**0.49**	**0.42**	**0.42**	**0.43**	**0.43**
Total Space Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.4**	**1.5**	**1.5**	**1.4**	**1.3**	**1.1**	**1.2**	**1.4**	**1.5**	**1.5**	**1.5**	**1.7**	**1.3**	**1.2**	**1.2**	**1.2**	**1.0**	**1.0**	**1.1**	**1.1**
GHG Emissions by Building Type (Mt of CO_2e)																				
Single Detached	1.1	1.2	1.2	1.1	1.0	0.9	0.9	1.1	1.2	1.2	1.2	1.3	1.1	1.0	0.9	1.0	0.8	0.8	0.9	0.9
Single Attached	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Apartments	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mobile Homes	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**50.6**	**51.4**	**51.8**	**51.2**	**48.0**	**46.4**	**47.6**	**48.5**	**48.0**	**47.4**	**49.0**	**49.3**	**47.2**	**44.0**	**42.5**	**41.9**	**39.8**	**39.8**	**40.9**	**40.8**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

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Table 7: Space Heating Secondary Energy Use and GHG Emissions by Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating Energy Use (PJ)	**27.4**	**28.7**	**29.5**	**27.4**	**26.1**	**24.3**	**24.3**	**28.5**	**30.3**	**31.5**	**30.7**	**33.6**	**28.5**	**28.0**	**27.2**	**28.7**	**24.8**	**25.7**	**26.6**	**26.9**
Energy Use by Vintage (PJ)																				
Before 1946	9.1	9.4	9.6	8.8	8.2	7.5	7.4	8.6	9.1	9.3	9.0	9.8	8.2	7.9	7.6	7.9	6.7	6.8	7.0	6.9
1946–1960	2.9	3.0	3.0	2.8	2.6	2.4	2.4	2.7	2.9	2.9	2.8	3.1	2.6	2.5	2.4	2.5	2.1	2.2	2.2	2.2
1961–1977	4.3	4.4	4.5	4.1	3.8	3.5	3.5	4.0	4.2	4.3	4.1	4.4	3.7	3.6	3.5	3.6	3.1	3.1	3.2	3.2
1978–1983	3.2	3.3	3.4	3.0	2.9	2.6	2.6	3.0	3.1	3.2	3.1	3.4	2.8	2.8	2.6	2.8	2.4	2.4	2.5	2.5
1984–1995	6.2	6.4	6.5	6.0	5.6	5.1	5.1	5.9	6.1	6.3	6.1	6.6	5.5	5.4	5.1	5.4	4.6	4.7	4.9	4.9
1996–2000	1.7	1.8	1.8	1.7	1.6	1.5	1.4	1.7	1.8	1.8	1.8	1.9	1.6	1.6	1.5	1.6	1.4	1.4	1.5	1.5
2001–2005	0.0	0.4	0.7	1.1	1.4	1.6	1.6	1.9	2.0	2.1	2.0	2.2	1.9	1.8	1.8	1.9	1.6	1.7	1.7	1.7
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.1	1.5	1.8	1.9	1.6	1.6	1.5	1.6	1.4	1.5	1.5	1.5
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.9	1.1	1.4	1.2	1.3	1.3	1.3
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.8	1.1
Shares (%)																				
Before 1946	33.1	32.8	32.4	31.9	31.5	31.0	30.6	30.2	29.9	29.6	29.3	29.0	28.6	28.2	27.9	27.5	27.1	26.6	26.2	25.8
1946–1960	10.6	10.4	10.3	10.2	10.0	9.8	9.7	9.6	9.4	9.3	9.2	9.1	9.0	8.9	8.8	8.8	8.7	8.5	8.4	8.3
1961–1977	15.6	15.4	15.1	14.9	14.6	14.4	14.2	14.1	13.8	13.6	13.4	13.2	13.0	12.9	12.7	12.6	12.4	12.2	12.0	11.8
1978–1983	11.8	11.6	11.3	11.1	10.9	10.8	10.7	10.5	10.4	10.3	10.1	10.0	9.9	9.8	9.7	9.7	9.6	9.4	9.3	9.2
1984–1995	22.7	22.4	22.1	21.7	21.4	21.1	20.9	20.6	20.3	20.0	19.8	19.6	19.3	19.1	18.9	18.8	18.7	18.5	18.3	18.2
1996–2000	6.3	6.2	6.2	6.1	6.1	6.0	6.0	5.9	5.8	5.8	5.8	5.7	5.7	5.6	5.6	5.6	5.6	5.5	5.5	5.5
2001–2005	0.0	1.2	2.5	4.1	5.4	6.8	6.7	6.7	6.7	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	3.6	4.7	5.8	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.1	3.2	4.1	4.9	4.9	4.9	4.9	4.9
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.2	3.2	4.2
Activity																				
Total Floor Space (million m^2)	46.4	47.1	47.9	48.9	49.8	50.7	51.6	52.5	53.5	54.2	55.1	55.9	56.7	57.6	58.2	58.9	59.4	60.6	61.3	62.1
Energy Intensity (GJ/m^2)	**0.59**	**0.61**	**0.62**	**0.56**	**0.52**	**0.48**	**0.47**	**0.54**	**0.57**	**0.58**	**0.56**	**0.60**	**0.50**	**0.49**	**0.47**	**0.49**	**0.42**	**0.42**	**0.43**	**0.43**
Total Space Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.4**	**1.5**	**1.5**	**1.4**	**1.3**	**1.1**	**1.2**	**1.4**	**1.5**	**1.5**	**1.5**	**1.7**	**1.3**	**1.2**	**1.2**	**1.2**	**1.0**	**1.0**	**1.1**	**1.1**
GHG Emissions by Vintage (Mt of CO_2e)																				
Before 1946	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1946–1960	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1961–1977	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1
1978–1983	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1984–1995	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1996–2000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2001–2005	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**50.6**	**51.4**	**51.8**	**51.2**	**48.0**	**46.4**	**47.6**	**48.5**	**48.0**	**47.4**	**49.0**	**49.3**	**47.2**	**44.0**	**42.5**	**41.9**	**39.8**	**39.8**	**40.9**	**40.8**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

Residential Sector

Nova Scotia
Table 8: Space Heating Secondary Energy Use by System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating Energy Use (PJ)	**27.4**	**28.7**	**29.5**	**27.4**	**26.1**	**24.3**	**24.3**	**28.5**	**30.3**	**31.5**	**30.7**	**33.6**	**28.5**	**28.0**	**27.2**	**28.7**	**24.8**	**25.7**	**26.6**	**26.9**
Energy Use by System Type (PJ)																				
Heating Oil – Normal Efficiency	8.1	7.8	7.1	5.7	4.4	3.1	2.5	2.2	1.8	1.1	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0
Heating Oil – Medium Efficiency	7.6	9.0	10.5	10.4	9.7	9.2	9.9	12.6	13.8	14.6	15.4	17.5	14.0	12.6	12.0	12.2	10.0	10.6	11.5	11.8
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Natural Gas – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Electric	3.5	3.8	4.0	4.0	4.3	4.1	3.8	3.9	4.5	4.7	4.3	4.7	4.2	4.6	4.8	5.0	4.7	5.0	4.9	5.0
Heat Pump	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7
Other[1]	0.5	0.7	0.7	0.7	0.6	0.9	0.9	0.9	1.0	1.0	1.0	0.8	0.6	0.5	0.4	0.5	0.5	0.4	0.1	0.1
Wood	1.2	0.9	0.8	0.7	0.9	0.9	0.9	1.2	1.2	1.2	1.1	1.2	1.2	1.4	1.4	1.5	1.4	1.4	1.5	1.4
Dual Systems																				
Wood/Electric	3.2	3.0	2.8	2.5	3.0	3.1	3.1	3.9	3.9	4.2	3.8	4.2	4.1	4.7	4.6	5.2	4.7	4.5	4.8	4.7
Wood/Heating Oil	2.9	3.1	3.2	2.9	2.8	2.6	2.6	3.3	3.4	3.6	3.6	3.9	3.3	3.2	3.0	3.2	2.7	2.7	2.9	2.9
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Heating Oil – Normal Efficiency	29.7	27.1	23.9	20.6	16.7	12.7	10.4	7.9	6.1	3.6	2.2	1.9	1.5	1.1	0.6	0.5	0.2	0.1	0.1	0.0
Heating Oil – Medium Efficiency	27.8	31.4	35.5	37.9	37.2	37.7	41.0	44.2	45.7	46.4	50.2	51.9	49.1	45.0	44.1	42.7	40.3	41.4	43.3	43.8
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Natural Gas – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8
Electric	12.9	13.4	13.6	14.7	16.4	17.0	15.5	13.7	14.9	15.0	14.1	13.9	14.8	16.2	17.6	17.2	18.8	19.6	18.3	18.6
Heat Pump	1.0	1.1	1.2	1.4	1.6	1.7	1.6	1.4	1.6	1.6	1.6	1.6	1.7	1.9	2.2	2.2	2.4	2.6	2.5	2.6
Other[1]	1.8	2.4	2.4	2.7	2.5	3.6	3.8	3.1	3.3	3.2	3.2	2.2	2.1	1.8	1.6	1.9	1.9	1.7	0.3	0.3
Wood	4.2	3.1	2.8	2.7	3.3	3.8	3.8	4.1	3.8	3.9	3.6	3.6	4.1	4.9	5.0	5.4	5.7	5.4	5.5	5.4
Dual Systems																				
Wood/Electric	11.6	10.5	9.6	9.2	11.4	12.6	12.7	13.8	12.9	13.4	12.4	12.4	14.3	16.7	16.9	18.0	18.8	17.6	17.9	17.3
Wood/Heating Oil	10.7	10.7	10.7	10.5	10.6	10.5	10.9	11.5	11.3	11.4	11.6	11.7	11.6	11.4	11.0	11.1	10.7	10.4	10.8	10.7
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4
Activity																				
Total Floor Space (million m^2)	46.4	47.1	47.9	48.9	49.8	50.7	51.6	52.5	53.5	54.2	55.1	55.9	56.7	57.6	58.2	58.9	59.4	60.6	61.3	62.1
Energy Intensity (GJ/m^2)	**0.59**	**0.61**	**0.62**	**0.56**	**0.52**	**0.48**	**0.47**	**0.54**	**0.57**	**0.58**	**0.56**	**0.60**	**0.50**	**0.49**	**0.47**	**0.49**	**0.42**	**0.42**	**0.43**	**0.43**
Heat Gains (PJ)	**2.5**	**2.7**	**2.9**	**2.8**	**2.9**	**2.7**	**2.4**	**2.5**	**2.8**	**2.9**	**2.6**	**2.8**	**2.5**	**2.7**	**2.9**	**3.0**	**2.9**	**3.2**	**3.1**	**3.3**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**

1) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]

Table 9: Space Heating GHG Emissions by System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.4**	**1.5**	**1.5**	**1.4**	**1.3**	**1.1**	**1.2**	**1.4**	**1.5**	**1.5**	**1.5**	**1.7**	**1.3**	**1.2**	**1.2**	**1.2**	**1.0**	**1.0**	**1.1**	**1.1**
GHG Emissions by System Type (Mt of CO_2e)																				
Heating Oil – Normal Efficiency	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil – Medium Efficiency	0.5	0.6	0.7	0.7	0.7	0.6	0.7	0.9	0.9	1.0	1.1	1.2	1.0	0.9	0.8	0.8	0.7	0.7	0.8	0.8
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heat Pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dual Systems																				
Wood/Electric	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Wood/Heating Oil	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Heating Oil – Normal Efficiency	40.5	36.5	31.9	27.8	24.0	18.8	15.0	11.3	8.7	5.2	3.1	2.6	2.2	1.7	1.0	0.8	0.4	0.2	0.2	0.0
Heating Oil – Medium Efficiency	37.7	42.0	47.1	50.9	52.8	55.3	58.8	62.7	65.2	67.1	70.6	72.5	71.5	69.7	70.2	68.9	67.8	69.4	71.2	71.9
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Natural Gas – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9
Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heat Pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	2.2	2.9	2.8	3.2	3.1	4.7	4.9	3.9	4.2	4.1	4.1	2.8	2.7	2.5	2.4	2.7	2.9	2.6	0.5	0.4
Wood	2.0	1.4	1.2	1.2	1.6	1.9	1.9	2.0	1.9	2.0	1.7	1.7	2.0	2.6	2.8	3.0	3.3	3.2	3.2	3.1
Dual Systems																				
Wood/Electric	5.2	4.6	4.1	4.0	5.3	6.1	6.0	6.5	6.1	6.4	5.7	5.7	6.9	8.7	9.0	9.8	10.8	10.0	9.9	9.6
Wood/Heating Oil	12.2	12.3	12.4	12.4	12.7	12.8	12.9	13.3	13.4	13.5	13.7	13.8	13.7	13.7	13.4	13.4	13.3	13.1	13.4	13.3
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GHG Intensity (tonne/TJ)	**50.6**	**51.4**	**51.8**	**51.2**	**48.0**	**46.4**	**47.6**	**48.5**	**48.0**	**47.4**	**49.0**	**49.3**	**47.2**	**44.0**	**42.5**	**41.9**	**39.8**	**39.8**	**40.9**	**40.8**
Heat Gains (PJ)	**2.5**	**2.7**	**2.9**	**2.8**	**2.9**	**2.7**	**2.4**	**2.5**	**2.8**	**2.9**	**2.6**	**2.8**	**2.5**	**2.7**	**2.9**	**3.0**	**2.9**	**3.2**	**3.1**	**3.3**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]

Table 10: Water Heating Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Water Heating Energy Use (PJ)	**7.8**	**8.4**	**8.5**	**7.8**	**7.1**	**7.0**	**7.6**	**8.8**	**7.8**	**7.6**	**8.4**	**8.6**	**8.0**	**7.2**	**6.2**	**5.9**	**5.5**	**5.4**	**6.1**	**6.0**
Energy Use by Energy Source (PJ)																				
Electricity	2.3	2.5	2.5	2.4	2.4	2.5	2.5	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.2	2.1	2.3	2.3
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	5.0	5.5	5.6	5.1	4.3	4.1	4.7	5.7	5.0	4.9	5.6	5.9	5.3	4.4	3.6	3.4	2.9	2.8	3.4	3.3
Other[2]	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Shares (%)																				
Electricity	29.7	29.5	29.5	30.6	34.2	35.8	32.7	29.0	30.1	30.0	27.4	26.2	28.3	31.9	35.1	35.3	39.0	39.8	37.1	37.7
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	63.9	65.0	65.9	65.3	60.8	58.4	61.5	64.7	64.2	64.2	67.1	68.5	65.7	61.2	57.9	57.1	53.0	52.9	55.7	55.4
Other[2]	0.5	0.7	0.6	0.6	0.6	0.8	0.9	0.7	0.7	0.7	0.7	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.1	0.0
Wood	5.9	4.9	4.0	3.6	4.4	5.0	5.0	5.6	5.0	5.2	4.8	4.8	5.5	6.5	6.6	7.2	7.6	7.0	7.1	6.8
Activity																				
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/household)	**21.8**	**23.1**	**23.2**	**21.1**	**19.0**	**18.4**	**20.1**	**23.1**	**20.1**	**19.5**	**21.5**	**21.9**	**20.3**	**18.2**	**15.5**	**14.9**	**13.8**	**13.2**	**14.8**	**14.4**
Total Water Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.2**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**46.9**	**47.6**	**48.0**	**47.5**	**44.5**	**43.1**	**45.3**	**47.6**	**47.1**	**47.2**	**49.2**	**50.0**	**48.2**	**45.2**	**42.9**	**42.4**	**39.6**	**39.4**	**41.2**	**40.9**
Heat Loss (PJ)	**0.2**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]

Table 11: Water Heating Secondary Energy Use and GHG Emissions by Building Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Water Heating Energy Use (PJ)	**7.8**	**8.4**	**8.5**	**7.8**	**7.1**	**7.0**	**7.6**	**8.8**	**7.8**	**7.6**	**8.4**	**8.6**	**8.0**	**7.2**	**6.2**	**5.9**	**5.5**	**5.4**	**6.1**	**6.0**
Energy Use by Building Type (PJ)																				
Single Detached	5.6	6.0	6.1	5.6	5.1	5.0	5.5	6.4	5.6	5.5	5.9	6.0	5.6	5.0	4.3	4.2	3.9	3.8	4.3	4.2
Single Attached	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Apartments	1.3	1.4	1.5	1.3	1.2	1.2	1.3	1.5	1.3	1.3	1.5	1.6	1.5	1.3	1.1	1.1	1.0	1.0	1.1	1.1
Mobile Homes	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Shares (%)																				
Single Detached	72.1	72.0	72.0	71.9	72.1	72.3	72.4	72.5	72.0	71.4	70.8	70.2	70.1	70.1	70.0	70.1	70.1	70.0	70.0	69.9
Single Attached	7.1	7.2	7.2	7.3	7.2	7.1	6.9	6.8	7.1	7.4	7.7	8.0	8.0	8.1	8.2	8.5	8.6	8.7	8.7	8.8
Apartments	17.1	17.1	17.1	17.1	17.0	16.9	16.9	16.8	17.2	17.6	18.0	18.4	18.4	18.4	18.4	18.2	18.2	18.2	18.3	18.3
Mobile Homes	3.7	3.7	3.7	3.6	3.7	3.7	3.8	3.9	3.8	3.7	3.6	3.5	3.5	3.4	3.4	3.1	3.1	3.1	3.1	3.0
Activity																				
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/household)	**21.8**	**23.1**	**23.2**	**21.1**	**19.0**	**18.4**	**20.1**	**23.1**	**20.1**	**19.5**	**21.5**	**21.9**	**20.3**	**18.2**	**15.5**	**14.9**	**13.8**	**13.2**	**14.8**	**14.4**
Total Water Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.2**
GHG Emissions by Building Type (Mt of CO_2e)																				
Single Detached	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Single Attached	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Apartments	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Mobile Homes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**46.9**	**47.6**	**48.0**	**47.5**	**44.5**	**43.1**	**45.3**	**47.6**	**47.1**	**47.2**	**49.2**	**50.0**	**48.2**	**45.2**	**42.9**	**42.4**	**39.6**	**39.4**	**41.2**	**40.9**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

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Table 12: Appliance Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Appliance Energy Use (PJ)	**5.0**	**5.4**	**5.5**	**5.3**	**5.3**	**5.5**	**5.6**	**5.9**	**5.5**	**5.5**	**5.6**	**5.7**	**5.9**	**6.1**	**5.9**	**5.8**	**6.1**	**6.1**	**6.6**	**6.6**
Energy Use by Energy Source (PJ)																				
Electricity	5.0	5.4	5.5	5.3	5.3	5.5	5.6	5.9	5.5	5.5	5.6	5.7	5.9	6.1	5.9	5.8	6.1	6.1	6.5	6.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	99.4	99.6	99.6	99.5	99.5	99.4	99.4	99.4	99.2	99.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.8	0.8
Activity																				
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/household)	**14.0**	**14.8**	**15.0**	**14.3**	**14.2**	**14.5**	**14.7**	**15.3**	**14.3**	**14.0**	**14.4**	**14.6**	**14.9**	**15.6**	**14.9**	**14.6**	**15.1**	**15.1**	**16.0**	**15.9**
Total Appliance GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

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Table 13: Appliance Secondary Energy Use and GHG Emissions by Appliance Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Appliance Energy Use (PJ)	**5.0**	**5.4**	**5.5**	**5.3**	**5.3**	**5.5**	**5.6**	**5.9**	**5.5**	**5.5**	**5.6**	**5.7**	**5.9**	**6.1**	**5.9**	**5.8**	**6.1**	**6.1**	**6.6**	**6.6**
Energy Use by Appliance Type (PJ)																				
Refrigerator	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8
Freezer	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4
Dishwasher[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Clothes Washer[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Clothes Dryer	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1
Range	0.8	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9
Other Appliances[3]	1.3	1.5	1.6	1.6	1.7	1.8	1.9	2.1	2.0	2.1	2.2	2.4	2.5	2.7	2.7	2.7	2.8	2.9	3.2	3.2
Shares (%)																				
Refrigerator	23.9	23.0	22.1	20.7	19.8	19.0	18.4	17.7	17.1	16.4	15.7	15.0	14.5	14.0	13.6	13.2	12.9	12.7	12.6	12.5
Freezer	10.5	9.9	9.2	8.8	8.3	7.9	7.6	7.3	7.0	6.7	6.3	6.1	6.0	5.9	5.8	5.8	5.8	5.7	5.7	5.6
Dishwasher[2]	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.0	1.0	1.0
Clothes Washer[2]	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.3	2.1	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.9
Clothes Dryer	18.5	18.5	18.4	18.7	18.7	18.8	18.8	18.9	18.8	18.8	18.7	18.6	18.5	18.4	18.3	18.3	18.4	18.0	17.6	17.2
Range	16.1	16.4	16.5	16.8	17.1	17.1	16.9	16.7	16.3	16.6	16.2	15.6	15.2	14.9	14.6	14.4	14.2	14.0	14.0	13.9
Other Appliances[3]	26.3	27.5	29.0	30.3	31.5	32.7	34.0	35.4	37.0	37.9	39.8	41.6	43.0	44.0	45.1	46.0	46.7	47.5	48.3	49.0
Activity																				
Total Households (thousands)	359.5	362.6	366.6	370.6	374.0	377.0	379.6	382.9	387.9	392.5	389.8	391.2	393.4	393.3	397.0	400.0	402.0	406.0	410.8	415.6
Energy Intensity (GJ/household)	**14.0**	**14.8**	**15.0**	**14.3**	**14.2**	**14.5**	**14.7**	**15.3**	**14.3**	**14.0**	**14.4**	**14.6**	**14.9**	**15.6**	**14.9**	**14.6**	**15.1**	**15.1**	**16.0**	**15.9**
Total Appliance GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Appliance Type (Mt of CO_2e)																				
Refrigerator	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freezer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dishwasher[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clothes Washer[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clothes Dryer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Range	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Appliances[3]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**
Heat Loss by Appliance Type (PJ)																				
Refrigerator	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4
Freezer	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2
Dishwasher[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clothes Washer[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Clothes Dryer	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Range	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Other[3]	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.9	0.9	1.0	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.4

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) Excludes hot water requirements.
3) "Other Appliances" includes small appliances such as microwaves, televisions, cable boxes, video cassette recorders, stereo systems and computers.

Residential Sector

Nova Scotia
Table 14: Total Households by Building Type and Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Households (thousands)	**359.5**	**362.6**	**366.6**	**370.6**	**374.0**	**377.0**	**379.6**	**382.9**	**387.9**	**392.5**	**389.8**	**391.2**	**393.4**	**393.3**	**397.0**	**400.0**	**402.0**	**406.0**	**410.8**	**415.6**
Households by Building Type (thousands)																				
Single Detached	242.9	244.9	247.4	249.9	252.1	253.9	255.5	257.6	260.8	263.7	261.8	262.7	264.0	263.8	266.1	268.0	269.2	271.7	274.8	277.9
Single Attached	23.5	24.0	24.5	25.0	25.5	25.9	26.3	26.8	27.4	27.9	27.9	28.3	28.6	28.8	29.3	29.7	30.1	30.6	31.1	31.7
Apartments	78.6	79.3	80.2	81.0	81.8	82.5	83.1	83.8	84.9	85.9	85.3	85.7	86.2	86.2	87.0	87.7	88.1	89.0	90.1	91.1
Mobile Homes	14.5	14.5	14.5	14.6	14.6	14.7	14.7	14.7	14.8	14.9	14.7	14.7	14.6	14.6	14.6	14.6	14.6	14.7	14.8	14.9
Shares (%)																				
Single Detached	67.6	67.5	67.5	67.4	67.4	67.4	67.3	67.3	67.2	67.2	67.2	67.1	67.1	67.1	67.0	67.0	67.0	66.9	66.9	66.9
Single Attached	6.5	6.6	6.7	6.7	6.8	6.9	6.9	7.0	7.1	7.1	7.2	7.2	7.3	7.3	7.4	7.4	7.5	7.5	7.6	7.6
Apartments	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9
Mobile Homes	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6
Households by Energy Source (thousands)																				
Electricity	91.3	93.1	92.1	92.8	94.6	94.8	96.1	96.8	98.5	101.8	101.9	102.8	105.1	105.1	106.1	106.9	107.4	108.5	109.7	111.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	214.1	216.5	220.8	223.5	224.7	226.5	227.7	229.8	232.2	233.3	231.5	232.2	233.4	233.4	235.6	237.4	238.5	240.9	243.8	246.6
Other[1]	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.4	7.3	7.3	7.4	7.4	7.4	7.5	7.5	7.6	7.7	7.8
Wood	46.9	45.8	46.4	47.0	47.4	48.4	48.5	49.0	49.8	49.9	49.1	48.9	47.5	47.5	47.9	48.3	48.5	49.0	49.6	50.2
Shares (%)																				
Electricity	25.4	25.7	25.1	25.0	25.3	25.2	25.3	25.3	25.4	25.9	26.1	26.3	26.7	26.7	26.7	26.7	26.7	26.7	26.7	26.7
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	59.5	59.7	60.2	60.3	60.1	60.1	60.0	60.0	59.9	59.5	59.4	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3
Other[1]	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Wood	13.0	12.6	12.6	12.7	12.7	12.8	12.8	12.8	12.8	12.7	12.6	12.5	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 15: Housing Stock by Building Type and Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Housing Stock (thousands)	**377.9**	**381.4**	**385.3**	**390.5**	**395.2**	**399.5**	**403.8**	**408.0**	**412.3**	**415.8**	**419.4**	**422.8**	**426.3**	**430.8**	**433.7**	**436.3**	**439.2**	**446.0**	**450.0**	**454.2**
(thousands)																				
Single Detached	255.8	257.9	260.4	263.8	266.4	269.2	271.7	274.0	276.4	278.2	280.3	282.0	283.6	285.2	286.3	287.3	288.2	290.8	292.5	294.0
Single Attached	24.8	25.0	25.3	25.9	26.3	26.8	27.4	27.9	28.4	28.9	29.5	30.1	30.7	31.3	31.8	32.2	32.6	33.5	34.1	34.7
Apartments	82.0	83.1	84.1	85.2	86.6	87.4	88.6	89.8	91.1	92.1	93.0	94.0	95.2	97.3	98.6	99.8	101.3	104.5	106.2	108.1
Mobile Homes	15.2	15.4	15.5	15.7	15.8	16.0	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	17.0	17.0	17.1	17.2	17.3	17.4
Shares (%)																				
Single Detached	67.7	67.6	67.6	67.5	67.4	67.4	67.3	67.2	67.0	66.9	66.8	66.7	66.5	66.2	66.0	65.8	65.6	65.2	65.0	64.7
Single Attached	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	6.9	7.0	7.0	7.1	7.2	7.3	7.3	7.4	7.4	7.5	7.6	7.6
Apartments	21.7	21.8	21.8	21.8	21.9	21.9	21.9	22.0	22.1	22.2	22.2	22.2	22.3	22.6	22.7	22.9	23.1	23.4	23.6	23.8
Mobile Homes	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.8
(thousands)																				
Before 1946	84.7	83.5	82.2	80.9	79.7	78.5	77.3	76.1	74.9	73.7	72.6	71.5	70.3	69.2	68.2	67.1	66.0	65.1	64.1	63.1
1946–1960	34.4	34.0	33.6	33.2	32.8	32.4	32.0	31.6	31.3	30.9	30.5	30.2	29.8	29.5	29.1	28.8	28.4	28.1	27.8	27.4
1961–1977	62.2	61.3	60.4	59.6	58.7	57.8	57.0	56.1	55.3	54.5	53.7	52.9	52.1	51.3	50.5	49.8	49.0	48.4	47.7	46.9
1978–1983	49.7	49.1	48.5	48.0	47.4	46.8	46.3	45.7	45.2	44.7	44.1	43.6	43.1	42.6	42.1	41.5	41.0	40.6	40.1	39.6
1984–1995	111.1	110.3	109.5	108.7	107.9	107.1	106.4	105.6	104.8	104.0	103.2	102.5	101.7	100.9	100.2	99.4	98.7	98.0	97.3	96.6
1996–2000	35.8	35.7	35.6	35.4	35.3	35.2	35.1	35.0	34.9	34.8	34.7	34.6	34.5	34.4	34.3	34.2	34.1	34.0	33.9	33.8
2001–2005	0.0	7.5	15.5	24.7	33.4	41.6	41.6	41.5	41.5	41.5	41.4	41.4	41.4	41.3	41.3	41.3	41.2	41.2	41.2	41.2
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	8.2	16.2	24.4	31.7	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.0	39.0	39.0
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	14.4	22.5	29.0	35.2	35.2	35.2	35.2	35.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	16.3	23.7	31.3
Shares (%)																				
Before 1946	22.4	21.9	21.3	20.7	20.2	19.6	19.1	18.6	18.2	17.7	17.3	16.9	16.5	16.1	15.7	15.4	15.0	14.6	14.2	13.9
1946–1960	9.1	8.9	8.7	8.5	8.3	8.1	7.9	7.8	7.6	7.4	7.3	7.1	7.0	6.8	6.7	6.6	6.5	6.3	6.2	6.0
1961–1977	16.5	16.1	15.7	15.3	14.8	14.5	14.1	13.8	13.4	13.1	12.8	12.5	12.2	11.9	11.7	11.4	11.2	10.8	10.6	10.3
1978–1983	13.1	12.9	12.6	12.3	12.0	11.7	11.5	11.2	11.0	10.7	10.5	10.3	10.1	9.9	9.7	9.5	9.3	9.1	8.9	8.7
1984–1995	29.4	28.9	28.4	27.8	27.3	26.8	26.3	25.9	25.4	25.0	24.6	24.2	23.9	23.4	23.1	22.8	22.5	22.0	21.6	21.3
1996–2000	9.5	9.3	9.2	9.1	8.9	8.8	8.7	8.6	8.5	8.4	8.3	8.2	8.1	8.0	7.9	7.8	7.8	7.6	7.5	7.4
2001–2005	0.0	2.0	4.0	6.3	8.4	10.4	10.3	10.2	10.1	10.0	9.9	9.8	9.7	9.6	9.5	9.5	9.4	9.2	9.2	9.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.0	4.0	5.9	7.6	9.3	9.2	9.2	9.1	9.0	9.0	8.9	8.8	8.7	8.6
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.4	5.2	6.7	8.1	8.0	7.9	7.8	7.8
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.7	5.3	6.9

Office of Energy Efficiency, Demand Policy and Analysis Division, Market Analysis Group.

Residential Sector

Nova Scotia
Table 16: Single Detached and Single Attached Housing Stock by Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Detached Housing Stock (thousands)	**255.8**	**257.9**	**260.4**	**263.8**	**266.4**	**269.2**	**271.7**	**274.0**	**276.4**	**278.2**	**280.3**	**282.0**	**283.6**	**285.2**	**286.3**	**287.3**	**288.2**	**290.8**	**292.5**	**294.0**
Stock by Vintage (thousands)																				
Before 1946	58.5	57.6	56.7	55.9	55.0	54.2	53.3	52.5	51.7	50.9	50.1	49.3	48.5	47.8	47.0	46.3	45.5	44.9	44.2	43.5
1946–1960	23.5	23.2	23.0	22.7	22.4	22.2	21.9	21.7	21.4	21.1	20.9	20.6	20.4	20.2	19.9	19.7	19.4	19.2	19.0	18.8
1961–1977	42.9	42.3	41.7	41.0	40.4	39.8	39.3	38.7	38.1	37.5	37.0	36.4	35.9	35.3	34.8	34.3	33.8	33.3	32.8	32.3
1978–1983	33.8	33.4	33.0	32.6	32.3	31.9	31.5	31.1	30.8	30.4	30.0	29.7	29.3	29.0	28.6	28.3	27.9	27.6	27.3	27.0
1984–1995	71.0	70.5	70.0	69.5	69.0	68.5	68.0	67.4	66.9	66.4	65.9	65.5	65.0	64.5	64.0	63.5	63.0	62.6	62.1	61.6
1996–2000	26.1	26.0	26.0	25.9	25.8	25.7	25.7	25.6	25.5	25.4	25.4	25.3	25.2	25.1	25.1	25.0	24.9	24.8	24.8	24.7
2001–2005	0.0	4.8	10.0	16.2	21.5	27.0	27.0	26.9	26.9	26.9	26.9	26.9	26.8	26.8	26.8	26.8	26.8	26.7	26.7	26.7
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	5.1	10.1	15.0	19.5	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.0	24.0
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	8.4	12.5	16.0	19.5	19.5	19.5	19.5	19.5
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	8.1	12.1	15.9
Shares (%)																				
Before 1946	22.9	22.3	21.8	21.2	20.6	20.1	19.6	19.2	18.7	18.3	17.9	17.5	17.1	16.7	16.4	16.1	15.8	15.4	15.1	14.8
1946–1960	9.2	9.0	8.8	8.6	8.4	8.2	8.1	7.9	7.7	7.6	7.5	7.3	7.2	7.1	7.0	6.8	6.7	6.6	6.5	6.4
1961–1977	16.8	16.4	16.0	15.6	15.2	14.8	14.5	14.1	13.8	13.5	13.2	12.9	12.6	12.4	12.2	11.9	11.7	11.4	11.2	11.0
1978–1983	13.2	13.0	12.7	12.4	12.1	11.8	11.6	11.4	11.1	10.9	10.7	10.5	10.3	10.2	10.0	9.8	9.7	9.5	9.3	9.2
1984–1995	27.8	27.3	26.9	26.3	25.9	25.4	25.0	24.6	24.2	23.9	23.5	23.2	22.9	22.6	22.3	22.1	21.9	21.5	21.2	21.0
1996–2000	10.2	10.1	10.0	9.8	9.7	9.6	9.4	9.3	9.2	9.1	9.0	9.0	8.9	8.8	8.8	8.7	8.6	8.5	8.5	8.4
2001–2005	0.0	1.9	3.8	6.1	8.1	10.0	9.9	9.8	9.7	9.7	9.6	9.5	9.5	9.4	9.4	9.3	9.3	9.2	9.1	9.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	5.4	7.0	8.6	8.5	8.5	8.4	8.4	8.4	8.3	8.3	8.2	8.2
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.0	4.4	5.6	6.8	6.8	6.7	6.7	6.6
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.8	4.1	5.4
Total Single Attached Housing Stock (thousands)	**24.8**	**25.0**	**25.3**	**25.9**	**26.3**	**26.8**	**27.4**	**27.9**	**28.4**	**28.9**	**29.5**	**30.1**	**30.7**	**31.3**	**31.8**	**32.2**	**32.6**	**33.5**	**34.1**	**34.7**
Stock by Vintage (thousands)																				
Before 1946	3.3	3.2	3.2	3.1	3.1	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.4
1946–1960	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1961–1977	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.8
1978–1983	4.4	4.3	4.3	4.2	4.2	4.1	4.1	4.0	4.0	3.9	3.9	3.9	3.8	3.8	3.7	3.7	3.6	3.6	3.6	3.5
1984–1995	9.7	9.6	9.6	9.5	9.4	9.4	9.3	9.2	9.2	9.1	9.0	9.0	8.9	8.8	8.8	8.7	8.6	8.6	8.5	8.4
1996–2000	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
2001–2005	0.0	0.5	1.0	1.8	2.5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.1	3.1	3.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.5	2.3	3.0	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.7	2.5	3.2	3.8	3.8	3.8	3.8	3.8
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.7	2.5	3.3
Shares (%)																				
Before 1946	13.1	12.8	12.5	12.0	11.6	11.2	10.8	10.5	10.1	9.8	9.4	9.1	8.8	8.5	8.2	8.0	7.8	7.5	7.2	7.0
1946–1960	5.8	5.7	5.6	5.4	5.2	5.1	4.9	4.8	4.6	4.5	4.4	4.2	4.1	3.9	3.8	3.8	3.7	3.5	3.4	3.3
1961–1977	9.8	9.6	9.3	9.0	8.7	8.4	8.1	7.9	7.6	7.3	7.1	6.9	6.6	6.4	6.2	6.0	5.9	5.6	5.5	5.3
1978–1983	17.7	17.3	16.9	16.4	15.9	15.4	15.0	14.5	14.1	13.6	13.2	12.8	12.4	12.0	11.7	11.4	11.1	10.7	10.4	10.1
1984–1995	39.2	38.6	37.8	36.8	35.8	34.9	34.0	33.1	32.2	31.4	30.6	29.8	28.9	28.2	27.5	27.0	26.4	25.6	24.9	24.3
1996–2000	14.4	14.2	14.0	13.7	13.4	13.1	12.8	12.5	12.3	12.0	11.7	11.5	11.2	10.9	10.8	10.6	10.4	10.1	9.9	9.7
2001–2005	0.0	1.8	3.9	6.8	9.4	11.8	11.6	11.4	11.1	10.9	10.7	10.5	10.3	10.1	9.9	9.8	9.6	9.4	9.2	9.0
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.8	5.4	8.0	10.4	12.8	12.5	12.3	12.0	11.9	11.7	11.5	11.2	11.0	10.9
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	5.6	8.0	10.0	11.8	11.7	11.3	11.1	11.0
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	5.0	7.2	9.4

Residential Sector

Nova Scotia
Table 17: Apartments and Mobile Homes Housing Stock by Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Apartments Housing Stock (thousands)	**82.0**	**83.1**	**84.1**	**85.2**	**86.6**	**87.4**	**88.6**	**89.8**	**91.1**	**92.1**	**93.0**	**94.0**	**95.2**	**97.3**	**98.6**	**99.8**	**101.3**	**104.5**	**106.2**	**108.1**
Stock by Vintage (thousands)																				
Before 1946	19.4	19.1	18.8	18.5	18.2	18.0	17.7	17.4	17.1	16.9	16.6	16.4	16.1	15.9	15.6	15.4	15.1	15.0	14.7	14.5
1946–1960	7.9	7.8	7.7	7.7	7.6	7.5	7.4	7.3	7.2	7.1	7.1	7.0	6.9	6.8	6.7	6.6	6.6	6.5	6.4	6.4
1961–1977	14.3	14.1	13.8	13.6	13.4	13.3	13.1	12.9	12.7	12.5	12.3	12.1	11.9	11.8	11.6	11.4	11.3	11.1	11.0	10.8
1978–1983	8.8	8.7	8.6	8.5	8.4	8.3	8.3	8.2	8.1	8.0	7.9	7.8	7.7	7.6	7.5	7.4	7.3	7.3	7.2	7.1
1984–1995	26.8	26.6	26.4	26.2	26.0	25.8	25.6	25.4	25.2	25.1	24.9	24.7	24.5	24.3	24.1	24.0	23.8	23.7	23.5	23.3
1996–2000	4.9	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.6	4.6	4.6	4.6	4.6
2001–2005	0.0	2.0	3.8	5.8	8.1	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.7	9.7	9.7	9.7	9.7	9.7
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.0	4.0	6.2	8.1	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.8	6.8	8.8	10.8	10.8	10.8	10.8	10.8
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	6.1	8.5	11.2
Shares (%)																				
Before 1946	23.6	23.0	22.4	21.7	21.1	20.5	20.0	19.4	18.8	18.3	17.9	17.4	16.9	16.3	15.8	15.4	14.9	14.3	13.9	13.4
1946–1960	9.7	9.4	9.2	9.0	8.7	8.6	8.3	8.1	7.9	7.7	7.6	7.4	7.2	7.0	6.8	6.7	6.5	6.2	6.1	5.9
1961–1977	17.4	16.9	16.5	16.0	15.5	15.2	14.7	14.3	13.9	13.6	13.2	12.9	12.6	12.1	11.8	11.4	11.1	10.6	10.3	10.0
1978–1983	10.8	10.5	10.3	10.0	9.8	9.5	9.3	9.1	8.8	8.6	8.5	8.3	8.1	7.8	7.6	7.4	7.2	6.9	6.8	6.6
1984–1995	32.6	32.0	31.4	30.7	30.0	29.5	28.9	28.3	27.7	27.2	26.7	26.3	25.7	25.0	24.5	24.0	23.5	22.6	22.1	21.5
1996–2000	5.9	5.8	5.7	5.6	5.5	5.5	5.4	5.3	5.2	5.1	5.1	5.0	4.9	4.8	4.7	4.7	4.6	4.4	4.3	4.2
2001–2005	0.0	2.4	4.6	6.8	9.3	11.2	11.1	10.9	10.7	10.6	10.5	10.4	10.3	10.0	9.9	9.8	9.6	9.3	9.2	9.0
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.3	4.5	6.8	8.8	10.5	10.4	10.3	10.1	9.9	9.8	9.7	9.4	9.2	9.1
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	4.0	6.9	9.0	10.8	10.7	10.3	10.2	10.0
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	5.8	8.0	10.4
Total Mobile Homes Housing Stock (thousands)	**15.2**	**15.4**	**15.5**	**15.7**	**15.8**	**16.0**	**16.2**	**16.3**	**16.4**	**16.5**	**16.6**	**16.7**	**16.8**	**16.9**	**17.0**	**17.0**	**17.1**	**17.2**	**17.3**	**17.4**
Stock by Vintage (thousands)																				
Before 1946	3.6	3.6	3.5	3.5	3.4	3.3	3.3	3.2	3.2	3.1	3.1	3.1	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7
1946–1960	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
1961–1977	2.7	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0
1978–1983	2.6	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1
1984–1995	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.3	3.2	3.2	3.2	3.2
1996–2000	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
2001–2005	0.0	0.3	0.6	1.0	1.3	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.9	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.7	0.9	1.2	1.2	1.2	1.2	1.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.9
Shares (%)																				
Before 1946	23.7	23.2	22.6	22.0	21.5	20.9	20.4	19.9	19.5	19.0	18.6	18.2	17.8	17.5	17.1	16.8	16.5	16.1	15.8	15.5
1946–1960	9.6	9.4	9.2	9.0	8.8	8.6	8.5	8.3	8.1	8.0	7.8	7.7	7.6	7.4	7.3	7.2	7.1	7.0	6.9	6.7
1961–1977	17.4	17.0	16.6	16.2	15.8	15.4	15.1	14.7	14.4	14.1	13.8	13.5	13.2	12.9	12.7	12.5	12.3	12.0	11.7	11.5
1978–1983	17.2	16.9	16.6	16.2	15.8	15.5	15.2	14.8	14.6	14.3	14.0	13.8	13.5	13.3	13.1	12.9	12.7	12.5	12.3	12.1
1984–1995	23.9	23.6	23.2	22.7	22.3	21.9	21.6	21.3	20.9	20.6	20.3	20.1	19.8	19.6	19.4	19.1	18.9	18.7	18.4	18.2
1996–2000	8.0	7.9	7.8	7.7	7.6	7.5	7.4	7.4	7.3	7.2	7.1	7.1	7.0	7.0	6.9	6.9	6.8	6.8	6.7	6.6
2001–2005	0.0	1.9	3.9	6.2	8.2	10.1	10.0	9.9	9.8	9.8	9.7	9.6	9.6	9.5	9.5	9.4	9.4	9.3	9.3	9.2
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	5.4	7.0	8.6	8.5	8.5	8.4	8.4	8.4	8.4	8.3	8.2	8.2
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.9	4.4	5.6	6.8	6.7	6.7	6.7	6.6
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.7	4.1	5.3

Residential Sector

Nova Scotia
Table 18: Floor Space by Building Type and Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Floor Space (million m^2)	**46.4**	**47.1**	**47.9**	**48.9**	**49.8**	**50.7**	**51.6**	**52.5**	**53.5**	**54.2**	**55.1**	**55.9**	**56.7**	**57.6**	**58.2**	**58.9**	**59.4**	**60.6**	**61.3**	**62.1**
(million m^2)																				
Single Detached	35.2	35.7	36.3	37.0	37.7	38.3	39.0	39.6	40.2	40.8	41.3	41.9	42.3	42.8	43.2	43.5	43.8	44.4	44.8	45.1
Single Attached	3.2	3.3	3.4	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.4	4.5	4.6	4.7	4.8	4.9	5.1	5.2
Apartments	6.6	6.7	6.8	7.0	7.1	7.3	7.4	7.6	7.8	7.9	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.6	9.8	10.1
Mobile Homes	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7
Shares (%)																				
Single Detached	75.9	75.8	75.8	75.7	75.6	75.6	75.5	75.4	75.2	75.1	75.0	74.9	74.7	74.3	74.1	73.9	73.7	73.2	73.0	72.7
Single Attached	7.0	7.0	7.0	7.1	7.1	7.1	7.2	7.3	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.0	8.2	8.3	8.3
Apartments	14.1	14.2	14.3	14.3	14.3	14.3	14.4	14.4	14.5	14.6	14.6	14.6	14.8	15.0	15.2	15.3	15.5	15.8	16.0	16.2
Mobile Homes	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7
m^2)																				
Before 1946	10.4	10.4	10.4	10.3	10.3	10.2	10.2	10.2	10.1	10.1	10.0	10.0	9.9	9.8	9.7	9.6	9.5	9.3	9.2	9.0
1946–1960	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.5	3.5	3.5	3.5	3.4	3.4	3.4	3.3
1961–1977	6.8	6.7	6.7	6.6	6.6	6.5	6.5	6.4	6.4	6.3	6.3	6.2	6.2	6.1	6.0	6.0	5.9	5.8	5.7	5.6
1978–1983	6.0	6.0	5.9	5.8	5.8	5.8	5.7	5.7	5.7	5.6	5.6	5.6	5.5	5.5	5.5	5.4	5.4	5.3	5.2	5.2
1984–1995	14.6	14.5	14.4	14.3	14.2	14.0	13.9	13.8	13.7	13.6	13.5	13.4	13.3	13.2	13.1	13.0	12.9	12.8	12.8	12.7
1996–2000	4.8	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5
2001–2005	0.0	1.0	2.1	3.4	4.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.6
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	3.6	4.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.2	3.4	4.4	5.4	5.4	5.4	5.4	5.4
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.6	3.8	5.0
Shares (%)																				
Before 1946	22.5	22.1	21.6	21.1	20.7	20.2	19.8	19.3	18.9	18.6	18.2	17.9	17.5	17.0	16.7	16.3	15.9	15.4	15.0	14.6
1946–1960	8.2	8.0	7.8	7.6	7.5	7.3	7.1	6.9	6.8	6.6	6.5	6.4	6.2	6.1	6.0	5.9	5.8	5.6	5.5	5.3
1961–1977	14.6	14.2	13.9	13.5	13.2	12.9	12.6	12.3	12.0	11.7	11.4	11.1	10.9	10.6	10.4	10.2	9.9	9.6	9.4	9.1
1978–1983	13.0	12.7	12.3	11.9	11.6	11.4	11.1	10.8	10.6	10.4	10.1	9.9	9.7	9.5	9.4	9.2	9.0	8.7	8.5	8.3
1984–1995	31.4	30.7	30.0	29.2	28.4	27.7	27.0	26.3	25.7	25.1	24.6	24.0	23.5	23.0	22.6	22.1	21.8	21.2	20.8	20.4
1996–2000	10.3	10.1	9.9	9.7	9.5	9.3	9.1	8.9	8.7	8.6	8.4	8.3	8.1	8.0	7.9	7.8	7.7	7.5	7.4	7.3
2001–2005	0.0	2.2	4.4	6.9	9.2	11.3	11.0	10.8	10.6	10.5	10.3	10.2	10.0	9.8	9.7	9.6	9.5	9.3	9.2	9.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.3	4.5	6.7	8.5	10.4	10.2	10.1	9.9	9.8	9.7	9.6	9.4	9.3	9.2
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	4.0	6.0	7.6	9.1	9.1	8.9	8.8	8.7
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	4.3	6.2	8.1

Office of Energy Efficiency, Demand Policy and Analysis Division, Market Analysis Group.

Residential Sector

Nova Scotia
Table 19: Single Detached and Single Attached Floor Space by Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
(million m^2)	**35.2**	**35.7**	**36.3**	**37.0**	**37.7**	**38.3**	**39.0**	**39.6**	**40.2**	**40.8**	**41.3**	**41.9**	**42.3**	**42.8**	**43.2**	**43.5**	**43.8**	**44.4**	**44.8**	**45.1**
Vintage (million m^2)																				
Before 1946	8.2	8.2	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.0	8.0	8.0	7.9	7.9	7.8	7.7	7.6	7.5	7.4	7.2
1946–1960	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
1961–1977	5.2	5.1	5.1	5.0	5.0	5.0	5.0	4.9	4.9	4.8	4.8	4.8	4.7	4.7	4.6	4.6	4.5	4.5	4.4	4.3
1978–1983	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.2	4.2	4.2	4.2	4.1	4.1	4.1	4.0	4.0	3.9	3.9
1984–1995	10.6	10.5	10.4	10.4	10.3	10.2	10.1	10.1	10.0	9.9	9.8	9.8	9.7	9.6	9.5	9.5	9.4	9.3	9.3	9.2
1996–2000	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5
2001–2005	0.0	0.7	1.5	2.5	3.3	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.7	2.5	3.2	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.5	2.2	2.8	3.4	3.4	3.4	3.4	3.4
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.5	2.3	3.0
Shares (%)																				
Before 1946	23.4	23.0	22.6	22.1	21.7	21.2	20.8	20.4	20.1	19.7	19.4	19.1	18.7	18.3	18.0	17.7	17.3	16.8	16.4	16.0
1946–1960	8.3	8.1	8.0	7.8	7.6	7.4	7.3	7.1	6.9	6.8	6.7	6.5	6.4	6.3	6.2	6.1	6.0	5.9	5.8	5.7
1961–1977	14.7	14.3	14.0	13.6	13.3	13.0	12.7	12.5	12.2	11.9	11.6	11.4	11.1	10.9	10.7	10.5	10.3	10.0	9.8	9.6
1978–1983	12.9	12.6	12.2	11.9	11.6	11.3	11.1	10.8	10.6	10.4	10.2	10.0	9.8	9.7	9.5	9.4	9.2	9.0	8.8	8.6
1984–1995	30.1	29.4	28.8	28.0	27.3	26.6	26.0	25.4	24.8	24.3	23.8	23.3	22.9	22.5	22.1	21.8	21.5	21.0	20.7	20.4
1996–2000	10.6	10.4	10.2	10.0	9.8	9.6	9.4	9.2	9.1	8.9	8.8	8.6	8.5	8.4	8.3	8.2	8.1	8.0	7.9	7.8
2001–2005	0.0	2.1	4.2	6.7	8.7	10.8	10.6	10.4	10.2	10.1	10.0	9.8	9.7	9.6	9.5	9.4	9.4	9.2	9.1	9.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.2	6.1	7.8	9.5	9.4	9.3	9.2	9.1	9.0	9.0	8.9	8.8	8.7
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.5	5.1	6.5	7.8	7.8	7.7	7.6	7.6
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	3.4	5.1	6.6
(million m^2)	**3.2**	**3.3**	**3.4**	**3.4**	**3.5**	**3.6**	**3.7**	**3.8**	**3.9**	**4.0**	**4.1**	**4.2**	**4.4**	**4.5**	**4.6**	**4.7**	**4.8**	**4.9**	**5.1**	**5.2**
Vintage (million m^2)																				
Before 1946	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1946–1960	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1961–1977	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
1978–1983	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1984–1995	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1996–2000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2001–2005	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.7	0.7	0.7	0.7	0.7
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.6
Shares (%)																				
Before 1946	14.5	14.3	14.0	13.5	13.1	12.7	12.2	11.8	11.4	11.0	10.7	10.3	9.9	9.5	9.2	9.0	8.7	8.3	7.9	7.6
1946–1960	6.1	5.9	5.8	5.6	5.5	5.3	5.1	5.0	4.8	4.6	4.5	4.4	4.2	4.1	3.9	3.9	3.7	3.6	3.4	3.3
1961–1977	9.0	8.8	8.6	8.3	8.0	7.8	7.5	7.2	7.0	6.7	6.5	6.3	6.0	5.8	5.6	5.5	5.3	5.0	4.9	4.7
1978–1983	17.1	16.6	16.2	15.5	15.1	14.6	14.1	13.7	13.2	12.8	12.4	12.0	11.6	11.2	10.9	10.6	10.3	9.9	9.5	9.2
1984–1995	37.7	36.9	36.0	34.7	33.6	32.6	31.5	30.4	29.4	28.4	27.5	26.6	25.5	24.7	24.0	23.4	22.7	21.8	21.2	20.5
1996–2000	15.6	15.3	15.0	14.5	14.1	13.8	13.4	13.0	12.6	12.2	11.9	11.5	11.1	10.8	10.6	10.3	10.1	9.7	9.5	9.2
2001–2005	0.0	2.1	4.5	7.7	10.6	13.3	12.9	12.6	12.2	11.9	11.6	11.3	10.9	10.6	10.4	10.2	10.0	9.7	9.4	9.2
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	3.4	6.4	9.4	12.2	14.8	14.4	14.0	13.6	13.3	13.1	12.8	12.4	12.1	11.8
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	6.8	9.7	12.0	14.1	13.8	13.4	13.1	12.8
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	6.3	9.1	11.7

Residential Sector

Nova Scotia
Table 20: Apartments and Mobile Homes Floor Space by Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Apartments Floor Space (million m^2)	**6.6**	**6.7**	**6.8**	**7.0**	**7.1**	**7.3**	**7.4**	**7.6**	**7.8**	**7.9**	**8.0**	**8.2**	**8.4**	**8.6**	**8.8**	**9.0**	**9.2**	**9.6**	**9.8**	**10.1**
Apartment Floor Space by Vintage (million m^2)																				
Before 1946	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1946–1960	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1961–1977	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
1978–1983	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1984–1995	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1
1996–2000	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2001–2005	0.0	0.2	0.4	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.0	1.2	1.2	1.2	1.2	1.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.0	1.3
Shares (%)																				
Before 1946	21.5	20.9	20.3	19.7	19.0	18.6	18.0	17.4	16.9	16.4	16.0	15.5	15.1	14.4	14.0	13.6	13.1	12.4	11.9	11.4
1946–1960	9.0	8.8	8.6	8.3	8.1	7.9	7.7	7.5	7.3	7.1	6.9	6.8	6.6	6.3	6.2	6.0	5.8	5.5	5.3	5.1
1961–1977	16.5	16.1	15.6	15.2	14.7	14.3	13.9	13.5	13.1	12.7	12.4	12.1	11.7	11.2	10.9	10.6	10.2	9.7	9.3	8.9
1978–1983	10.2	9.9	9.6	9.3	9.0	8.8	8.6	8.3	8.1	7.9	7.7	7.5	7.3	7.0	6.9	6.7	6.5	6.1	5.9	5.7
1984–1995	36.1	35.1	34.2	33.3	32.2	31.5	30.6	29.7	28.8	28.1	27.4	26.7	26.0	24.9	24.2	23.6	22.9	21.8	21.2	20.5
1996–2000	6.7	6.5	6.4	6.2	6.0	5.9	5.8	5.6	5.5	5.4	5.3	5.2	5.0	4.9	4.7	4.6	4.5	4.3	4.2	4.1
2001–2005	0.0	2.8	5.4	8.0	10.9	13.0	12.7	12.4	12.1	11.9	11.7	11.5	11.2	10.9	10.6	10.4	10.2	9.8	9.5	9.3
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.8	5.5	8.3	10.5	12.6	12.3	12.1	11.7	11.4	11.2	11.0	10.5	10.3	10.0
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	5.0	8.6	11.0	13.2	13.0	12.4	12.1	11.8
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	7.5	10.2	13.1
Total Mobile Homes Floor Space (million m^2)	**1.4**	**1.4**	**1.4**	**1.4**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**
m^2)																				
Before 1946	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1946–1960	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1961–1977	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1978–1983	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1984–1995	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
1996–2000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2001–2005	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Shares (%)																				
Before 1946	22.9	22.4	22.0	21.4	20.9	20.4	20.0	19.5	19.1	18.7	18.3	18.0	17.6	17.3	17.0	16.7	16.3	15.9	15.6	15.2
1946–1960	6.3	6.2	6.1	6.0	5.8	5.7	5.6	5.5	5.4	5.3	5.2	5.2	5.1	5.0	4.9	4.9	4.8	4.7	4.6	4.5
1961–1977	16.2	15.9	15.6	15.2	14.9	14.5	14.2	13.9	13.6	13.4	13.1	12.8	12.6	12.4	12.1	11.9	11.7	11.4	11.2	10.9
1978–1983	18.9	18.5	18.1	17.6	17.2	16.9	16.6	16.3	16.0	15.7	15.4	15.2	14.9	14.7	14.5	14.3	14.1	13.8	13.5	13.2
1984–1995	28.1	27.5	27.0	26.4	25.8	25.3	24.8	24.3	23.8	23.4	23.0	22.5	22.2	21.8	21.4	21.1	20.9	20.5	20.2	19.9
1996–2000	7.6	7.5	7.4	7.2	7.1	7.0	6.9	6.8	6.7	6.6	6.5	6.4	6.3	6.3	6.2	6.1	6.1	6.0	5.9	5.9
2001–2005	0.0	1.9	3.9	6.2	8.2	10.1	9.9	9.8	9.7	9.6	9.5	9.3	9.2	9.2	9.1	9.0	8.9	8.8	8.8	8.7
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.9	5.7	7.3	9.0	8.9	8.8	8.7	8.6	8.6	8.5	8.4	8.4	8.3
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.3	4.8	6.1	7.4	7.4	7.3	7.2	7.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	3.2	4.7	6.2

Residential Sector

Nova Scotia
Table 21: Heating System Stock by Building Type and Heating System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Heating System Stock (thousands)	**377.9**	**381.4**	**385.3**	**390.5**	**395.2**	**399.5**	**403.8**	**408.0**	**412.3**	**415.8**	**419.4**	**422.8**	**426.3**	**430.8**	**433.7**	**436.3**	**439.2**	**446.0**	**450.0**	**454.2**
(thousands)																				
Single Detached	255.8	257.9	260.4	263.8	266.4	269.2	271.7	274.0	276.4	278.2	280.3	282.0	283.6	285.2	286.3	287.3	288.2	290.8	292.5	294.0
Single Attached	24.8	25.0	25.3	25.9	26.3	26.8	27.4	27.9	28.4	28.9	29.5	30.1	30.7	31.3	31.8	32.2	32.6	33.5	34.1	34.7
Apartments	82.0	83.1	84.1	85.2	86.6	87.4	88.6	89.8	91.1	92.1	93.0	94.0	95.2	97.3	98.6	99.8	101.3	104.5	106.2	108.1
Mobile Homes	15.2	15.4	15.5	15.7	15.8	16.0	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	17.0	17.0	17.1	17.2	17.3	17.4
Shares (%)																				
Single Detached	67.7	67.6	67.6	67.5	67.4	67.4	67.3	67.2	67.0	66.9	66.8	66.7	66.5	66.2	66.0	65.8	65.6	65.2	65.0	64.7
Single Attached	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	6.9	7.0	7.0	7.1	7.2	7.3	7.3	7.4	7.4	7.5	7.6	7.6
Apartments	21.7	21.8	21.8	21.8	21.9	21.9	21.9	22.0	22.1	22.2	22.2	22.2	22.3	22.6	22.7	22.9	23.1	23.4	23.6	23.8
Mobile Homes	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.8
(thousands)																				
Heating Oil – Normal Efficiency	91.4	82.2	72.4	64.2	57.1	47.5	39.1	30.8	25.2	17.7	12.7	10.9	9.5	7.6	4.9	4.2	2.3	1.0	1.4	0.1
Heating Oil – Medium Efficiency	104.7	115.7	129.0	139.7	147.9	159.1	168.6	178.3	184.9	191.6	198.0	202.2	205.6	210.8	218.0	219.8	225.2	231.0	232.8	237.0
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0
Natural Gas – Medium Efficiency	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.0	1.9	1.7
Natural Gas – High Efficiency	2.2	2.3	2.4	2.6	2.6	2.9	3.4	4.1	4.3	4.5	4.7	5.0	5.2	5.3	5.3	5.6	5.6	5.7	5.7	5.9
Electric	86.6	88.3	87.0	87.7	89.6	89.8	91.2	91.7	93.0	95.7	96.8	97.1	98.6	98.8	97.7	97.8	97.2	98.2	98.7	98.9
Heat Pump	11.6	12.1	12.8	13.5	14.1	14.8	15.5	16.1	16.8	17.4	18.0	18.5	19.0	19.4	19.7	20.2	20.5	21.1	21.8	22.3
Other[1]	7.5	7.5	7.5	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.7	7.6	7.7	7.6	7.6	7.6	7.6	7.7	7.7
Wood	15.3	13.7	13.8	14.1	14.3	14.9	14.8	15.0	15.2	15.3	15.3	15.3	14.9	15.2	15.4	15.6	15.7	16.2	16.4	16.7
Dual Systems																				
Wood/Electric	23.2	23.6	23.9	24.2	24.6	24.9	25.2	25.5	25.8	26.1	26.3	26.3	26.2	26.3	26.0	26.1	26.0	26.1	26.3	26.4
Wood/Heating Oil	31.6	32.0	32.5	32.9	33.4	33.8	34.2	34.6	35.1	35.4	35.7	35.6	35.6	35.6	35.2	35.4	35.2	35.4	35.6	35.8
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8
Shares (%)																				
Heating Oil – Normal Efficiency	24.2	21.6	18.8	16.4	14.5	11.9	9.7	7.5	6.1	4.3	3.0	2.6	2.2	1.8	1.1	1.0	0.5	0.2	0.3	0.0
Heating Oil – Medium Efficiency	27.7	30.3	33.5	35.8	37.4	39.8	41.8	43.7	44.8	46.1	47.2	47.8	48.2	48.9	50.3	50.4	51.3	51.8	51.7	52.2
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Natural Gas – High Efficiency	0.6	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3
Electric	22.9	23.2	22.6	22.4	22.7	22.5	22.6	22.5	22.6	23.0	23.1	23.0	23.1	22.9	22.5	22.4	22.1	22.0	21.9	21.8
Heat Pump	3.1	3.2	3.3	3.4	3.6	3.7	3.8	3.9	4.1	4.2	4.3	4.4	4.4	4.5	4.5	4.6	4.7	4.7	4.8	4.9
Other[1]	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
Wood	4.0	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.5	3.5	3.6	3.6	3.6	3.6	3.7	3.7
Dual Systems																				
Wood/Electric	6.1	6.2	6.2	6.2	6.2	6.2	6.2	6.3	6.3	6.3	6.3	6.2	6.2	6.1	6.0	6.0	5.9	5.9	5.9	5.8
Wood/Heating Oil	8.4	8.4	8.4	8.4	8.4	8.5	8.5	8.5	8.5	8.5	8.5	8.4	8.3	8.3	8.1	8.1	8.0	7.9	7.9	7.9
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 22: Single Detached Heating System Stock by Heating System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Detached Heating System Stock (thousands)	**255.8**	**257.9**	**260.4**	**263.8**	**266.4**	**269.2**	**271.7**	**274.0**	**276.4**	**278.2**	**280.3**	**282.0**	**283.6**	**285.2**	**286.3**	**287.3**	**288.2**	**290.8**	**292.5**	**294.0**
(thousands)																				
Heating Oil – Normal Efficiency	55.2	48.8	41.7	35.9	30.8	23.9	18.1	12.1	8.3	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil – Medium Efficiency	71.1	78.5	87.6	94.9	100.2	108.1	114.2	120.6	124.6	128.8	132.5	134.2	135.2	137.0	140.4	140.7	142.9	144.8	145.7	147.1
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.1	1.1	0.9
Natural Gas – High Efficiency	1.6	1.6	1.7	1.8	1.9	2.0	2.4	2.9	3.1	3.2	3.3	3.5	3.6	3.6	3.6	3.8	3.8	3.8	3.8	3.9
Electric	56.6	57.6	56.6	57.0	58.1	58.2	59.0	59.2	59.9	61.4	61.9	61.6	62.1	61.6	60.1	59.9	58.9	58.8	58.8	58.4
Heat Pump	9.8	10.3	10.9	11.4	12.0	12.6	13.1	13.6	14.2	14.7	15.2	15.5	15.8	16.1	16.2	16.6	16.8	17.3	17.7	18.1
Other[1]	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.0	5.0	4.9	4.9	4.8	4.8	4.8	4.8
Wood	1.3	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dual Systems																				
Wood/Electric	21.9	22.2	22.5	22.8	23.1	23.5	23.7	24.0	24.3	24.6	24.7	24.7	24.6	24.7	24.3	24.5	24.4	24.5	24.6	24.7
Wood/Heating Oil	30.4	30.8	31.3	31.7	32.1	32.6	33.0	33.3	33.7	34.1	34.3	34.3	34.2	34.2	33.8	34.0	33.8	33.9	34.2	34.3
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.7
Shares (%)																				
Heating Oil – Normal Efficiency	21.6	18.9	16.0	13.6	11.6	8.9	6.6	4.4	3.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil – Medium Efficiency	27.8	30.4	33.6	36.0	37.6	40.1	42.0	44.0	45.1	46.3	47.3	47.6	47.7	48.0	49.0	49.0	49.6	49.8	49.8	50.0
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3
Natural Gas – High Efficiency	0.6	0.6	0.6	0.7	0.7	0.7	0.9	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Electric	22.1	22.3	21.8	21.6	21.8	21.6	21.7	21.6	21.7	22.1	22.1	21.9	21.9	21.6	21.0	20.8	20.4	20.2	20.1	19.9
Heat Pump	3.8	4.0	4.2	4.3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.5	5.6	5.7	5.7	5.8	5.8	5.9	6.1	6.2
Other[1]	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.6
Wood	0.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dual Systems																				
Wood/Electric	8.5	8.6	8.6	8.7	8.7	8.7	8.7	8.8	8.8	8.8	8.8	8.8	8.7	8.6	8.5	8.5	8.5	8.4	8.4	8.4
Wood/Heating Oil	11.9	12.0	12.0	12.0	12.1	12.1	12.1	12.2	12.2	12.3	12.3	12.1	12.1	12.0	11.8	11.8	11.7	11.7	11.7	11.7
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 23: Single Attached Heating System Stock by Heating System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
(thousands)	**24.8**	**25.0**	**25.3**	**25.9**	**26.3**	**26.8**	**27.4**	**27.9**	**28.4**	**28.9**	**29.5**	**30.1**	**30.7**	**31.3**	**31.8**	**32.2**	**32.6**	**33.5**	**34.1**	**34.7**
Type (thousands)																				
Heating Oil – Normal Efficiency	6.6	6.1	5.4	4.9	4.5	3.8	3.2	2.7	2.3	1.8	1.4	1.0	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil – Medium Efficiency	7.2	7.8	8.7	9.5	10.1	11.0	11.8	12.6	13.1	13.8	14.4	15.1	15.6	16.2	17.0	17.2	17.6	18.2	18.5	18.9
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Natural Gas – High Efficiency	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Electric	5.9	6.0	5.9	6.0	6.2	6.3	6.4	6.5	6.7	6.9	7.1	7.3	7.6	7.7	7.7	7.8	7.8	7.9	8.0	8.1
Heat Pump	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.4
Other[1]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Wood	2.6	2.5	2.5	2.6	2.6	2.7	2.8	2.8	2.9	2.9	2.9	3.0	2.9	3.0	3.0	3.0	3.0	3.1	3.1	3.2
Dual Systems																				
Wood/Electric	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Wood/Heating Oil	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Heating Oil – Normal Efficiency	26.5	24.3	21.5	18.9	16.9	14.2	11.8	9.7	8.1	6.2	4.7	3.4	2.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil – Medium Efficiency	28.9	31.1	34.3	36.8	38.5	41.0	43.1	45.1	46.3	47.7	49.0	50.1	50.9	51.6	53.4	53.3	53.9	54.2	54.1	54.4
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Natural Gas – High Efficiency	0.6	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.2	1.3
Electric	23.8	24.1	23.5	23.4	23.6	23.4	23.5	23.4	23.5	24.0	24.1	24.2	24.6	24.6	24.3	24.3	23.9	23.6	23.6	23.3
Heat Pump	3.8	4.0	4.2	4.3	4.5	4.7	4.8	5.0	5.2	5.4	5.5	5.7	5.9	6.1	6.2	6.3	6.4	6.5	6.7	6.8
Other[1]	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Wood	10.3	9.9	9.9	10.0	10.0	10.1	10.1	10.1	10.1	10.0	9.9	9.9	9.5	9.5	9.4	9.4	9.2	9.2	9.2	9.1
Dual Systems																				
Wood/Electric	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3
Wood/Heating Oil	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 24: Apartments Heating System Stock by Heating System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Apartments Heating System Stock (thousands)	**82.0**	**83.1**	**84.1**	**85.2**	**86.6**	**87.4**	**88.6**	**89.8**	**91.1**	**92.1**	**93.0**	**94.0**	**95.2**	**97.3**	**98.6**	**99.8**	**101.3**	**104.5**	**106.2**	**108.1**
(thousands)																				
Heating Oil – Normal Efficiency	25.2	23.4	21.6	20.1	18.8	17.2	15.5	13.9	12.8	11.3	10.0	8.8	7.8	6.3	4.5	3.8	2.1	1.0	1.4	0.1
Heating Oil – Medium Efficiency	22.2	24.8	27.6	29.7	31.6	33.6	35.9	38.0	39.7	41.4	43.2	44.8	46.5	49.2	51.7	52.9	55.4	58.4	59.0	61.4
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3
Natural Gas – High Efficiency	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.5
Electric	20.3	20.8	20.6	20.8	21.3	21.4	21.8	22.0	22.4	23.2	23.6	23.9	24.6	25.2	25.5	25.8	26.1	27.0	27.4	27.9
Heat Pump	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8
Other[1]	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0
Wood	10.1	9.9	10.0	10.2	10.3	10.6	10.6	10.8	11.0	11.0	11.0	11.0	10.7	11.0	11.1	11.3	11.4	11.8	12.0	12.2
Dual Systems																				
Wood/Electric	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Wood/Heating Oil	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Heating Oil – Normal Efficiency	30.8	28.1	25.6	23.6	21.7	19.7	17.5	15.5	14.1	12.3	10.7	9.3	8.2	6.5	4.5	3.8	2.1	0.9	1.3	0.0
Heating Oil – Medium Efficiency	27.1	29.9	32.8	34.9	36.5	38.5	40.5	42.4	43.6	45.0	46.4	47.7	48.8	50.5	52.4	53.0	54.7	55.9	55.5	56.8
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3
Natural Gas – High Efficiency	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.4
Electric	24.8	25.0	24.5	24.4	24.6	24.5	24.6	24.5	24.6	25.1	25.3	25.4	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8
Heat Pump	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.6	1.6	1.7
Other[1]	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Wood	12.3	11.9	11.9	11.9	11.9	12.1	12.0	12.0	12.0	11.9	11.8	11.7	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Dual Systems																				
Wood/Electric	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Wood/Heating Oil	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 25: Mobile Homes Heating System Stock by Heating System Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
(thousands)	**15.2**	**15.4**	**15.5**	**15.7**	**15.8**	**16.0**	**16.2**	**16.3**	**16.4**	**16.5**	**16.6**	**16.7**	**16.8**	**16.9**	**17.0**	**17.0**	**17.1**	**17.2**	**17.3**	**17.4**
(thousands)																				
Heating Oil – Normal Efficiency	4.4	4.0	3.6	3.3	3.0	2.6	2.3	2.0	1.8	1.5	1.3	1.1	1.0	0.8	0.4	0.4	0.1	0.0	0.0	0.0
Heating Oil – Medium Efficiency	4.1	4.6	5.2	5.6	5.9	6.4	6.8	7.1	7.4	7.7	7.9	8.1	8.3	8.5	9.0	9.0	9.3	9.5	9.6	9.7
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Natural Gas – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electric	3.8	3.8	3.8	3.8	3.9	3.9	4.0	4.0	4.0	4.1	4.2	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.5	4.4
Heat Pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Dual Systems																				
Wood/Electric	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Wood/Heating Oil	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Heating Oil – Normal Efficiency	28.9	26.1	23.4	21.0	19.1	16.5	14.4	12.3	11.0	9.3	7.9	6.8	6.0	5.0	2.6	2.3	0.7	0.0	0.0	0.0
Heating Oil – Medium Efficiency	27.1	30.0	33.3	35.7	37.4	39.9	41.9	43.9	45.0	46.3	47.6	48.6	49.4	50.3	52.7	53.0	54.6	55.3	55.4	55.7
Heating Oil – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas – Normal Efficiency	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Natural Gas – Medium Efficiency	1.1	1.1	1.1	1.2	1.2	1.2	1.4	1.5	1.6	1.6	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9
Natural Gas – High Efficiency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electric	24.7	25.0	24.4	24.3	24.6	24.4	24.5	24.5	24.6	25.1	25.3	25.4	25.8	25.8	25.8	25.8	25.8	25.8	25.7	25.6
Heat Pump	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other[1]	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Wood	8.8	8.4	8.4	8.4	8.4	8.5	8.4	8.4	8.4	8.3	8.1	8.0	7.6	7.5	7.5	7.5	7.4	7.4	7.4	7.3
Dual Systems																				
Wood/Electric	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Wood/Heating Oil	5.1	5.1	5.1	5.1	5.2	5.2	5.2	5.2	5.2	5.3	5.3	5.3	5.4	5.4	5.5	5.5	5.5	5.6	5.6	5.6
Natural Gas/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil/Electric	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 26: Heating System Stock Efficiencies

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Type (%)																				
Heating Oil – Normal Efficiency	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Heating Oil – Medium Efficiency	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
Heating Oil – High Efficiency	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Natural Gas – Normal Efficiency	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Natural Gas – Medium Efficiency	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Natural Gas – High Efficiency	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Electric	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Heat Pump	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190
Other[1]	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Wood	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Dual Heating Systems Electric/Wood																				
Electricity	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Wood	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Dual Heating Systems Heating Oil/Wood																				
Heating Oil	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
Wood	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
Dual Heating Systems Electric/Natural Gas																				
Electricity	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Natural Gas	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Dual Heating Systems Electric/Heating Oil																				
Electricity	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Heating Oil	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia

Table 27: Cooling System Stock by Type, New Unit Efficiencies, Stock Efficiencies and Unit Capacity Ratio

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Cooling System Stock (thousands)	**33.0**	**25.0**	**29.0**	**34.0**	**38.0**	**43.0**	**49.7**	**65.5**	**64.0**	**70.2**	**77.4**	**79.8**	**86.5**	**91.2**	**95.8**	**101.5**	**106.1**	**111.3**	**116.5**	**121.4**
System Stock by Type (thousands)																				
Room	26.0	19.0	22.0	27.0	32.0	35.0	40.2	50.9	51.0	54.6	59.9	61.7	66.2	69.8	72.9	77.0	80.3	83.9	87.6	91.1
Central	7.0	6.0	7.0	7.0	6.0	8.0	9.5	14.6	13.0	15.7	17.5	18.0	20.3	21.4	22.8	24.5	25.8	27.3	28.8	30.2
Shares (%)																				
Room	78.8	76.0	75.9	79.4	84.2	81.4	80.9	77.8	79.7	77.7	77.4	77.4	76.6	76.5	76.2	75.8	75.7	75.4	75.2	75.1
Central	21.2	24.0	24.1	20.6	15.8	18.6	19.1	22.2	20.3	22.3	22.6	22.6	23.4	23.5	23.8	24.2	24.3	24.6	24.8	24.9
New Unit Efficiencies																				
Room (EER)[1]	9.4	9.4	9.4	9.4	9.4	9.4	10.9	10.9	10.9	10.9	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Central (SEER)[2]	10.3	10.3	10.3	10.3	10.3	10.3	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Stock Efficiencies																				
Room (EER)[1]	8.3	8.4	8.6	8.8	8.9	9.1	9.5	9.8	10.0	10.1	10.4	10.6	10.8	11.0	11.2	11.3	11.4	11.5	11.6	11.7
Central (SEER)[2]	9.6	9.7	9.7	9.8	9.9	10.0	10.3	10.5	10.7	10.9	11.1	11.2	11.4	11.6	11.7	11.9	12.1	12.3	12.5	12.7
Unit Capacity Ratio (Btu/hour)																				
Room	9,898	9,829	9,797	9,717	9,531	9,345	9,181	9,015	9,048	9,064	9,086	9,080	9,090	9,101	9,111	9,121	9,132	9,142	9,152	9,162
Central	33,466	33,624	33,768	33,919	33,389	32,873	32,372	31,873	31,872	31,884	31,886	33,236	33,225	33,225	33,220	33,215	33,213	33,208	33,205	33,202

1) Energy Efficiency Ratio.
2) Seasonal Energy Efficiency Ratio.

Residential Sector

Nova Scotia
Table 28: Water Heater Stock by Building Type and Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Water Heater Stock (thousands)	**377.9**	**381.4**	**385.3**	**390.5**	**395.2**	**399.5**	**403.8**	**408.0**	**412.3**	**415.8**	**419.4**	**422.8**	**426.3**	**430.8**	**433.7**	**436.3**	**439.2**	**446.0**	**450.0**	**454.2**
(thousands)																				
Single Detached	255.8	257.9	260.4	263.8	266.4	269.2	271.7	274.0	276.4	278.2	280.3	282.0	283.6	285.2	286.3	287.3	288.2	290.8	292.5	294.0
Single Attached	24.8	25.0	25.3	25.9	26.3	26.8	27.4	27.9	28.4	28.9	29.5	30.1	30.7	31.3	31.8	32.2	32.6	33.5	34.1	34.7
Apartments	82.0	83.1	84.1	85.2	86.6	87.4	88.6	89.8	91.1	92.1	93.0	94.0	95.2	97.3	98.6	99.8	101.3	104.5	106.2	108.1
Mobile Homes	15.2	15.4	15.5	15.7	15.8	16.0	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	17.0	17.0	17.1	17.2	17.3	17.4
Shares (%)																				
Single Detached	67.7	67.6	67.6	67.5	67.4	67.4	67.3	67.2	67.0	66.9	66.8	66.7	66.5	66.2	66.0	65.8	65.6	65.2	65.0	64.7
Single Attached	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	6.9	7.0	7.0	7.1	7.2	7.3	7.3	7.4	7.4	7.5	7.6	7.6
Apartments	21.7	21.8	21.8	21.8	21.9	21.9	21.9	22.0	22.1	22.2	22.2	22.2	22.3	22.6	22.7	22.9	23.1	23.4	23.6	23.8
Mobile Homes	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.8
(thousands)																				
Electricity	203.6	203.9	202.7	202.4	205.8	206.3	208.6	210.0	210.6	213.0	214.0	214.0	215.3	215.7	216.5	217.5	218.2	221.3	223.0	224.7
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	159.7	163.5	169.3	175.4	176.8	180.3	182.4	185.0	188.9	190.3	192.6	195.9	198.6	203.1	205.1	206.8	208.9	212.6	214.8	217.1
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	1.7	1.6	1.6	1.4	1.4	1.5	1.4	1.5	1.4	1.4	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.4
Wood	13.0	12.4	11.8	11.3	11.2	11.5	11.3	11.5	11.4	11.1	11.4	11.4	11.0	10.7	10.7	10.7	10.7	10.8	10.9	11.0
Shares (%)																				
Electricity	53.9	53.5	52.6	51.8	52.1	51.6	51.7	51.5	51.1	51.2	51.0	50.6	50.5	50.1	49.9	49.8	49.7	49.6	49.6	49.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	42.3	42.9	43.9	44.9	44.7	45.1	45.2	45.4	45.8	45.8	45.9	46.3	46.6	47.1	47.3	47.4	47.6	47.7	47.7	47.8
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	3.4	3.3	3.1	2.9	2.8	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia
Table 29: Single Detached and Single Attached Water Heater Stock by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Detached Water Heater Stock (thousands)	**255.8**	**257.9**	**260.4**	**263.8**	**266.4**	**269.2**	**271.7**	**274.0**	**276.4**	**278.2**	**280.3**	**282.0**	**283.6**	**285.2**	**286.3**	**287.3**	**288.2**	**290.8**	**292.5**	**294.0**
Water Heater Stock by Energy Source (thousands)																				
Electricity	137.8	137.9	137.0	136.7	138.7	139.0	140.4	141.1	141.2	142.5	143.0	142.8	143.2	142.8	143.0	143.2	143.2	144.3	144.9	145.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	108.1	110.5	114.4	118.5	119.2	121.5	122.7	124.3	126.6	127.3	128.7	130.7	132.1	134.4	135.4	136.2	137.1	138.6	139.6	140.5
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Wood	8.8	8.4	8.0	7.6	7.6	7.7	7.6	7.7	7.6	7.4	7.6	7.6	7.3	7.1	7.1	7.0	7.0	7.0	7.1	7.1
Shares (%)																				
Electricity	53.9	53.5	52.6	51.8	52.1	51.6	51.7	51.5	51.1	51.2	51.0	50.6	50.5	50.1	49.9	49.8	49.7	49.6	49.6	49.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	42.3	42.9	43.9	44.9	44.7	45.1	45.2	45.4	45.8	45.8	45.9	46.3	46.6	47.1	47.3	47.4	47.6	47.7	47.7	47.8
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	3.4	3.3	3.1	2.9	2.8	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4
Total Single Attached Water Heater Stock (thousands)	**24.8**	**25.0**	**25.3**	**25.9**	**26.3**	**26.8**	**27.4**	**27.9**	**28.4**	**28.9**	**29.5**	**30.1**	**30.7**	**31.3**	**31.8**	**32.2**	**32.6**	**33.5**	**34.1**	**34.7**
Water Heater Stock by Energy Source (thousands)																				
Electricity	13.4	13.4	13.3	13.4	13.7	13.8	14.1	14.3	14.5	14.8	15.0	15.2	15.5	15.7	15.9	16.0	16.2	16.6	16.9	17.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	10.5	10.7	11.1	11.6	11.8	12.1	12.4	12.6	13.0	13.2	13.5	13.9	14.3	14.8	15.0	15.3	15.5	16.0	16.3	16.6
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Wood	0.9	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Shares (%)																				
Electricity	53.9	53.5	52.6	51.8	52.1	51.6	51.7	51.5	51.1	51.2	51.0	50.6	50.5	50.1	49.9	49.8	49.7	49.6	49.6	49.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	42.3	42.9	43.9	44.9	44.7	45.1	45.2	45.4	45.8	45.8	45.9	46.3	46.6	47.1	47.3	47.4	47.6	47.7	47.7	47.8
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	3.4	3.3	3.1	2.9	2.8	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4

1) "Other" includes coal and propane.

Residential Sector

Nova Scotia
Table 30: Apartments and Mobile Homes Water Heater Stock by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Apartments Water Heater Stock (thousands)	**82.0**	**83.1**	**84.1**	**85.2**	**86.6**	**87.4**	**88.6**	**89.8**	**91.1**	**92.1**	**93.0**	**94.0**	**95.2**	**97.3**	**98.6**	**99.8**	**101.3**	**104.5**	**106.2**	**108.1**
(thousands)																				
Electricity	44.2	44.4	44.2	44.1	45.1	45.2	45.8	46.2	46.5	47.2	47.5	47.6	48.1	48.7	49.2	49.7	50.3	51.9	52.6	53.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	34.7	35.6	36.9	38.3	38.7	39.5	40.0	40.7	41.7	42.1	42.7	43.5	44.3	45.9	46.6	47.3	48.2	49.8	50.7	51.7
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	2.8	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.6	2.6
Shares (%)																				
Electricity	53.9	53.5	52.6	51.8	52.1	51.6	51.7	51.5	51.1	51.2	51.0	50.6	50.5	50.1	49.9	49.8	49.7	49.6	49.6	49.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	42.3	42.9	43.9	44.9	44.7	45.1	45.2	45.4	45.8	45.8	45.9	46.3	46.6	47.1	47.3	47.4	47.6	47.7	47.7	47.8
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	3.4	3.3	3.1	2.9	2.8	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4
(thousands)	**15.2**	**15.4**	**15.5**	**15.7**	**15.8**	**16.0**	**16.2**	**16.3**	**16.4**	**16.5**	**16.6**	**16.7**	**16.8**	**16.9**	**17.0**	**17.0**	**17.1**	**17.2**	**17.3**	**17.4**
(thousands)																				
Electricity	8.2	8.2	8.2	8.1	8.3	8.3	8.3	8.4	8.4	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.6	8.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	6.4	6.6	6.8	7.1	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.8	7.8	8.0	8.0	8.1	8.1	8.2	8.3	8.3
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Wood	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Shares (%)																				
Electricity	53.9	53.5	52.6	51.8	52.1	51.6	51.7	51.5	51.1	51.2	51.0	50.6	50.5	50.1	49.9	49.8	49.7	49.6	49.6	49.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	42.3	42.9	43.9	44.9	44.7	45.1	45.2	45.4	45.8	45.8	45.9	46.3	46.6	47.1	47.3	47.4	47.6	47.7	47.7	47.8
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Wood	3.4	3.3	3.1	2.9	2.8	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4

1) “Other” includes coal and propane.

Residential Sector

Nova Scotia

Table 31: Appliance Stock by Appliance Type and Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Appliance Stock by Appliance Type (thousands)																				
Refrigerator	408	415	421	428	434	439	444	448	452	457	453	452	455	455	459	462	465	469	475	480
Freezer	235	236	238	241	241	243	244	246	248	252	249	250	252	252	254	256	257	260	263	266
Dishwasher	147	153	158	167	172	179	182	188	193	198	199	202	203	203	205	206	207	209	212	214
Clothes Washer	297	300	303	308	308	312	314	317	320	326	324	324	326	326	329	332	333	337	341	345
Clothes Dryer	282	286	289	295	298	302	306	311	317	322	320	323	325	325	328	330	332	335	339	343
Range	337	343	347	353	360	364	367	373	381	386	386	391	393	393	397	400	402	406	411	416
Other Appliances[1]	4,633	4,894	5,093	5,365	5,527	5,810	5,984	6,133	6,311	6,375	6,401	6,575	6,762	6,897	7,136	7,306	7,512	7,732	8,006	8,279
Appliances per Household by Appliance Type																				
Refrigerator	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Freezer	0.65	0.65	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Dishwasher	0.41	0.42	0.43	0.45	0.46	0.47	0.48	0.49	0.50	0.51	0.51	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Clothes Washer	0.83	0.83	0.83	0.83	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Clothes Dryer	0.78	0.79	0.79	0.80	0.80	0.80	0.81	0.81	0.82	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Range	0.94	0.94	0.95	0.95	0.96	0.97	0.97	0.97	0.98	0.98	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Other Appliances[1]	12.89	13.50	13.89	14.48	14.78	15.41	15.76	16.02	16.27	16.24	16.42	16.80	17.19	17.53	17.98	18.26	18.69	19.05	19.49	19.92
Stock of Electric Appliances (thousands)																				
Refrigerator	408	415	421	428	434	439	444	448	452	457	453	452	455	455	459	462	465	469	475	480
Freezer	235	236	238	241	241	243	244	246	248	252	249	250	252	252	254	256	257	260	263	266
Dishwasher	147	153	158	167	172	179	182	188	193	198	199	202	203	203	205	206	207	209	212	214
Clothes Washer	297	300	303	308	308	312	314	317	320	326	324	324	326	326	329	332	333	337	341	345
Clothes Dryer	282	286	289	295	298	302	306	311	317	322	320	323	325	325	328	330	332	335	339	343
Range	337	343	347	353	360	364	367	370	374	375	372	373	375	375	379	382	384	387	392	396
Other Appliances[1]	4,633	4,894	5,093	5,365	5,527	5,810	5,984	6,133	6,311	6,375	6,401	6,575	6,762	6,897	7,136	7,306	7,512	7,732	8,006	8,279
Electric Appliances per Household by Appliance Type																				
Refrigerator	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Freezer	0.65	0.65	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Dishwasher	0.41	0.42	0.43	0.45	0.46	0.47	0.48	0.49	0.50	0.51	0.51	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Clothes Washer	0.83	0.83	0.83	0.83	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Clothes Dryer	0.78	0.79	0.79	0.80	0.80	0.80	0.81	0.81	0.82	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Range	0.94	0.94	0.95	0.95	0.96	0.97	0.97	0.97	0.97	0.96	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Other Appliances[1]	12.89	13.50	13.89	14.48	14.78	15.41	15.76	16.02	16.27	16.24	16.42	16.80	17.19	17.53	17.98	18.26	18.69	19.05	19.49	19.92
Stock of Natural Gas Appliances (thousands)																				
Clothes Dryer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Range	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	7.1	10.8	14.3	18.0	18.1	18.1	18.3	18.4	18.5	18.7	18.9	19.1
Natural Gas Appliances per Household by Appliance Type																				
Clothes Dryer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Range	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

1) “Other Appliances” includes small appliances such as microwaves, televisions, cable boxes, video cassette recorders, stereo systems and computers.

Residential Sector

Nova Scotia
Table 32: Gross Output Thermal Requirements per Household by Building Type and Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Detached (GJ/household)																				
Before 1946	100.2	101.5	102.8	104.1	105.5	106.8	108.1	109.5	111.0	112.5	114.0	115.5	116.2	116.9	117.6	118.3	118.3	118.3	118.3	118.3
1946–1960	79.5	80.0	80.5	81.1	81.6	82.1	82.5	83.0	83.5	84.0	84.5	85.0	85.5	86.0	86.5	87.0	87.0	87.0	87.0	87.0
1961–1977	64.9	65.4	65.8	66.3	66.9	67.6	68.3	68.9	69.3	69.7	70.1	70.5	70.9	71.4	71.8	72.2	72.2	72.2	72.2	72.2
1978–1983	61.7	61.7	61.7	61.7	62.1	62.5	62.9	63.2	63.6	64.0	64.3	64.7	65.1	65.5	65.9	66.3	66.3	66.3	66.3	66.3
1984–1995	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
1996–2000	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
2001–2005	0.0	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2	49.2
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.0	49.0	49.0	49.0
Single Attached (GJ/household)																				
Before 1946	93.0	94.1	95.2	96.3	96.9	97.5	98.0	98.6	99.5	100.4	101.3	102.2	102.8	103.5	104.1	104.7	104.7	104.7	104.7	104.7
1946–1960	78.6	79.1	79.6	80.2	80.7	81.1	81.6	82.1	82.6	83.1	83.5	84.0	84.5	85.0	85.6	86.1	86.1	86.1	86.1	86.1
1961–1977	58.6	59.0	59.4	59.8	60.2	60.5	60.9	61.3	61.6	62.0	62.3	62.7	63.1	63.5	63.8	64.2	64.2	64.2	64.2	64.2
1978–1983	52.2	52.2	52.2	52.2	52.5	52.8	53.1	53.4	53.8	54.1	54.4	54.7	55.0	55.4	55.7	56.0	56.0	56.0	56.0	56.0
1984–1995	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2
1996–2000	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
2001–2005	0.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.8	43.8	43.8	43.8
Apartments (GJ/household)																				
Before 1946	36.2	36.4	36.7	36.9	37.2	37.4	37.6	37.8	38.0	38.3	38.5	38.7	38.9	39.2	39.4	39.6	39.6	39.6	39.6	39.6
1946–1960	33.3	33.6	33.8	34.0	34.2	34.4	34.6	34.8	35.0	35.2	35.4	35.7	35.9	36.1	36.3	36.5	36.5	36.5	36.5	36.5
1961–1977	28.7	28.9	29.1	29.3	29.5	29.7	29.9	30.0	30.2	30.4	30.6	30.7	30.9	31.1	31.3	31.5	31.5	31.5	31.5	31.5
1978–1983	24.3	24.3	24.3	24.3	24.4	24.6	24.7	24.9	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.1	26.1	26.1	26.1
1984–1995	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2
1996–2000	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
2001–2005	0.0	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2	21.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.6	21.6	21.6	21.6
Mobile Homes (GJ/household)																				
Before 1946	87.6	88.2	88.8	89.4	90.0	90.5	91.0	91.6	92.1	92.6	93.2	93.7	94.3	94.9	95.4	96.0	96.0	96.0	96.0	96.0
1946–1960	53.5	53.9	54.3	54.6	54.9	55.3	55.6	55.9	56.3	56.6	56.9	57.2	57.6	57.9	58.3	58.6	58.6	58.6	58.6	58.6
1961–1977	64.2	64.6	65.0	65.5	65.9	66.2	66.6	67.0	67.4	67.8	68.2	68.6	69.0	69.4	69.9	70.3	70.3	70.3	70.3	70.3
1978–1983	64.5	64.5	64.5	64.5	64.9	65.3	65.6	66.0	66.4	66.8	67.2	67.6	68.0	68.4	68.8	69.2	69.2	69.2	69.2	69.2
1984–1995	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5
1996–2000	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2
2001–2005	0.0	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.5	41.5	41.5	41.5

Residential Sector

Nova Scotia
Table 33: Gross Output Thermal Requirements per Square Metre by Building Type and Vintage

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Detached (GJ/m^2)																				
Before 1946	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
1946–1960	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1961–1977	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1978–1983	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1984–1995	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1996–2000	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2001–2005	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Single Attached (GJ/m^2)																				
Before 1946	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1946–1960	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1961–1977	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1978–1983	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1984–1995	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1996–2000	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2001–2005	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2
Apartments (GJ/m^2)																				
Before 1946	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1946–1960	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1961–1977	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
1978–1983	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1984–1995	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1996–2000	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2001–2005	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2
Mobile Homes (GJ/m^2)																				
Before 1946	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1946–1960	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
1961–1977	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1978–1983	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
1984–1995	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1996–2000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2001–2005	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2006–2010	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2011–2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2016–2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4

Residential Sector

Nova Scotia[1]
Table 34: Single Detached Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Detached Energy Use (PJ)	**32.6**	**34.3**	**35.2**	**32.9**	**31.2**	**29.8**	**30.3**	**34.7**	**35.0**	**35.8**	**35.7**	**38.2**	**33.9**	**33.0**	**31.4**	**32.4**	**29.1**	**29.7**	**31.3**	**31.4**
Energy Use by Energy Source (PJ)																				
Electricity	10.2	10.9	11.3	11.0	11.3	11.3	11.0	11.4	11.5	11.6	11.4	11.7	11.4	11.9	11.8	11.9	11.9	12.3	12.6	12.7
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
Heating Oil	17.7	19.0	19.8	18.1	15.7	13.9	14.6	17.6	17.8	17.7	18.6	20.6	16.8	14.6	13.3	13.4	10.9	11.3	12.5	12.6
Other[2]	0.4	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.8	0.8	0.8	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.1	0.1
Wood	4.3	3.8	3.5	3.1	3.7	3.8	3.9	5.0	4.9	5.3	4.8	5.2	5.1	5.9	5.7	6.4	5.8	5.6	5.9	5.8
Shares (%)																				
Electricity	31.2	31.8	32.0	33.6	36.2	38.0	36.3	32.8	32.9	32.5	31.8	30.6	33.6	36.1	37.7	36.8	40.8	41.3	40.3	40.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.8
Heating Oil	54.4	55.4	56.2	55.1	50.3	46.6	48.2	50.6	50.7	49.6	52.0	53.9	49.5	44.4	42.4	41.5	37.4	38.1	40.0	40.2
Other[2]	1.3	1.7	1.7	1.9	1.8	2.5	2.6	2.2	2.4	2.4	2.4	1.6	1.4	1.3	1.2	1.4	1.3	1.2	0.2	0.2
Wood	13.1	11.1	10.0	9.5	11.8	12.9	12.9	14.4	14.0	14.7	13.3	13.6	15.1	17.8	18.1	19.8	19.9	18.7	18.8	18.3
Activity																				
Total Floor Space (million m^2)	35.2	35.7	36.3	37.0	37.7	38.3	39.0	39.6	40.2	40.8	41.3	41.9	42.3	42.8	43.2	43.5	43.8	44.4	44.8	45.1
Total Households (thousands)	242.9	244.9	247.4	249.9	252.1	253.9	255.5	257.6	260.8	263.7	261.8	262.7	264.0	263.8	266.1	268.0	269.2	271.7	274.8	277.9
Energy Intensity (GJ/m^2)	**0.93**	**0.96**	**0.97**	**0.89**	**0.83**	**0.78**	**0.78**	**0.88**	**0.87**	**0.88**	**0.87**	**0.91**	**0.80**	**0.77**	**0.73**	**0.74**	**0.67**	**0.67**	**0.70**	**0.70**
Energy Intensity (GJ/household)	**134.2**	**140.3**	**142.5**	**131.6**	**124.0**	**117.3**	**118.4**	**134.6**	**134.3**	**135.6**	**136.5**	**145.5**	**128.3**	**125.1**	**117.9**	**120.7**	**108.2**	**109.3**	**114.0**	**113.0**
Total Single Detached GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.4**	**1.5**	**1.5**	**1.4**	**1.2**	**1.1**	**1.2**	**1.4**	**1.4**	**1.4**	**1.5**	**1.6**	**1.3**	**1.2**	**1.1**	**1.1**	**0.9**	**1.0**	**1.0**	**1.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	1.3	1.3	1.4	1.3	1.1	1.0	1.0	1.2	1.3	1.3	1.3	1.5	1.2	1.0	0.9	1.0	0.8	0.8	0.9	0.9
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.6	0.3	0.4	0.6	0.7	0.8	1.0	1.0	1.1	1.2
Heating Oil	90.9	91.4	92.1	92.0	90.2	87.8	88.1	88.4	88.3	86.9	88.4	89.8	88.4	85.9	85.2	83.6	82.1	83.2	85.2	85.6
Other[2]	1.9	2.5	2.5	2.8	2.7	4.1	4.1	3.2	3.6	3.6	3.4	2.4	2.2	2.1	2.0	2.4	2.5	2.3	0.4	0.3
Wood	7.2	6.1	5.4	5.2	7.0	8.1	7.8	8.3	8.0	8.5	7.5	7.5	8.9	11.4	12.1	13.2	14.4	13.5	13.3	12.9
GHG Intensity (tonne/TJ)	**42.4**	**42.9**	**43.3**	**42.4**	**39.5**	**37.6**	**38.8**	**40.6**	**40.7**	**40.5**	**41.7**	**42.6**	**39.7**	**36.7**	**35.3**	**35.2**	**32.3**	**32.5**	**33.3**	**33.3**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]

Table 35: Single Detached Secondary Energy Use and GHG Emissions by End-Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Detached Energy Use (PJ)	**32.6**	**34.3**	**35.2**	**32.9**	**31.2**	**29.8**	**30.3**	**34.7**	**35.0**	**35.8**	**35.7**	**38.2**	**33.9**	**33.0**	**31.4**	**32.4**	**29.1**	**29.7**	**31.3**	**31.4**
Energy Use by End-Use (PJ)																				
Space Heating	22.0	23.0	23.7	22.0	20.9	19.4	19.4	22.7	24.2	25.1	24.4	26.8	22.7	22.2	21.6	22.7	19.6	20.2	20.9	21.1
Water Heating	5.6	6.0	6.1	5.6	5.1	5.0	5.5	6.4	5.6	5.5	5.9	6.0	5.6	5.0	4.3	4.2	3.9	3.8	4.3	4.2
Appliances	3.6	3.9	4.0	3.8	3.8	3.9	4.0	4.2	3.9	3.9	4.0	4.1	4.2	4.3	4.2	4.1	4.3	4.3	4.6	4.6
Lighting	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.3	1.3
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Shares (%)																				
Space Heating	67.5	67.0	67.3	66.9	66.9	65.2	64.1	65.5	68.9	70.1	68.4	70.1	67.0	67.3	68.7	70.3	67.2	68.1	66.8	67.3
Water Heating	17.3	17.6	17.3	17.1	16.4	16.9	18.3	18.5	16.0	15.3	16.6	15.7	16.5	15.2	13.7	12.9	13.3	12.7	13.6	13.3
Appliances	11.2	11.3	11.2	11.6	12.3	13.2	13.2	12.1	11.3	11.0	11.2	10.6	12.3	13.1	13.3	12.7	14.7	14.6	14.7	14.8
Lighting	3.9	4.0	4.0	4.3	4.4	4.6	4.4	3.9	3.6	3.5	3.5	3.3	3.8	4.0	3.9	3.7	4.2	4.1	4.1	4.1
Space Cooling	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.8	0.5
Activity																				
Total Floor Space (million m^2)	35.2	35.7	36.3	37.0	37.7	38.3	39.0	39.6	40.2	40.8	41.3	41.9	42.3	42.8	43.2	43.5	43.8	44.4	44.8	45.1
Total Households (thousands)	242.9	244.9	247.4	249.9	252.1	253.9	255.5	257.6	260.8	263.7	261.8	262.7	264.0	263.8	266.1	268.0	269.2	271.7	274.8	277.9
Energy Intensity (GJ/m^2)	**0.93**	**0.96**	**0.97**	**0.89**	**0.83**	**0.78**	**0.78**	**0.88**	**0.87**	**0.88**	**0.87**	**0.91**	**0.80**	**0.77**	**0.73**	**0.74**	**0.67**	**0.67**	**0.70**	**0.70**
Energy Intensity (GJ/household)	**134.2**	**140.3**	**142.5**	**131.6**	**124.0**	**117.3**	**118.4**	**134.6**	**134.3**	**135.6**	**136.5**	**145.5**	**128.3**	**125.1**	**117.9**	**120.7**	**108.2**	**109.3**	**114.0**	**113.0**
Total Single Detached GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.4**	**1.5**	**1.5**	**1.4**	**1.2**	**1.1**	**1.2**	**1.4**	**1.4**	**1.4**	**1.5**	**1.6**	**1.3**	**1.2**	**1.1**	**1.1**	**0.9**	**1.0**	**1.0**	**1.0**
GHG Emissions by End-Use (Mt of CO_2e)																				
Space Heating	1.1	1.2	1.2	1.1	1.0	0.9	0.9	1.1	1.2	1.2	1.2	1.3	1.1	1.0	0.9	1.0	0.8	0.8	0.9	0.9
Water Heating	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	80.9	80.6	80.9	80.9	81.7	80.8	78.8	78.5	81.5	82.3	80.5	81.5	80.0	81.3	83.3	84.5	83.6	84.6	83.1	83.6
Water Heating	19.1	19.4	19.1	19.1	18.3	19.2	21.2	21.5	18.5	17.7	19.5	18.4	20.0	18.6	16.6	15.4	16.2	15.3	16.8	16.3
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**42.4**	**42.9**	**43.3**	**42.4**	**39.5**	**37.6**	**38.8**	**40.6**	**40.7**	**40.5**	**41.7**	**42.6**	**39.7**	**36.7**	**35.3**	**35.2**	**32.3**	**32.5**	**33.3**	**33.3**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

Residential Sector

Nova Scotia[1]

Table 36: Single Attached Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Attached Energy Use (PJ)	**2.7**	**2.8**	**2.9**	**2.7**	**2.6**	**2.5**	**2.5**	**2.9**	**3.0**	**3.1**	**3.1**	**3.4**	**3.1**	**3.0**	**2.9**	**3.0**	**2.8**	**2.8**	**3.0**	**3.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.3
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	1.4	1.5	1.5	1.4	1.2	1.1	1.1	1.4	1.4	1.4	1.5	1.7	1.4	1.2	1.1	1.1	0.9	1.0	1.1	1.1
Other[2]	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Shares (%)																				
Electricity	32.6	33.3	33.7	35.4	37.9	39.7	38.0	34.4	34.6	34.3	33.8	32.7	35.9	38.5	40.5	39.5	43.4	44.0	42.9	43.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7
Heating Oil	51.4	52.4	53.3	52.1	47.1	43.4	45.1	47.3	47.4	46.5	49.0	50.5	46.2	40.8	38.3	37.3	33.6	34.3	36.2	36.4
Other[2]	1.2	1.6	1.6	1.8	1.6	2.3	2.4	2.0	2.2	2.2	2.2	1.5	1.4	1.2	1.1	1.3	1.3	1.2	0.2	0.2
Wood	14.8	12.6	11.4	10.7	13.3	14.5	14.5	16.3	15.8	16.3	14.6	15.0	16.2	19.0	19.7	21.4	21.1	20.0	20.1	19.5
Activity																				
Total Floor Space (million m^2)	3.2	3.3	3.4	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.4	4.5	4.6	4.7	4.8	4.9	5.1	5.2
Total Households (thousands)	23.5	24.0	24.5	25.0	25.5	25.9	26.3	26.8	27.4	27.9	27.9	28.3	28.6	28.8	29.3	29.7	30.1	30.6	31.1	31.7
Energy Intensity (GJ/m^2)	**0.82**	**0.85**	**0.86**	**0.79**	**0.74**	**0.69**	**0.69**	**0.77**	**0.76**	**0.77**	**0.76**	**0.80**	**0.70**	**0.67**	**0.63**	**0.64**	**0.58**	**0.57**	**0.60**	**0.59**
Energy Intensity (GJ/household)	**112.7**	**117.0**	**117.9**	**108.7**	**102.1**	**96.5**	**96.8**	**109.1**	**108.8**	**110.4**	**112.1**	**119.5**	**106.7**	**104.5**	**98.3**	**101.0**	**91.6**	**92.7**	**97.1**	**96.3**
Total Single Attached GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.0	1.1
Heating Oil	89.6	90.4	91.2	91.1	89.0	86.5	86.8	86.9	86.9	85.7	87.5	88.7	87.3	84.3	83.0	81.3	79.9	81.1	83.2	83.7
Other[2]	1.8	2.4	2.4	2.7	2.6	3.9	4.0	3.1	3.5	3.4	3.3	2.3	2.2	2.2	2.1	2.5	2.6	2.4	0.4	0.3
Wood	8.5	7.2	6.5	6.2	8.3	9.6	9.3	9.9	9.6	10.0	8.6	8.7	10.1	13.0	14.2	15.4	16.6	15.6	15.3	14.9
GHG Intensity (tonne/TJ)	**40.6**	**41.1**	**41.4**	**40.5**	**37.5**	**35.6**	**36.8**	**38.6**	**38.7**	**38.5**	**39.7**	**40.4**	**37.6**	**34.4**	**32.7**	**32.6**	**29.9**	**30.0**	**30.8**	**30.9**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]
Table 37: Single Attached Secondary Energy Use and GHG Emissions by End-Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Single Attached Energy Use (PJ)	**2.7**	**2.8**	**2.9**	**2.7**	**2.6**	**2.5**	**2.5**	**2.9**	**3.0**	**3.1**	**3.1**	**3.4**	**3.1**	**3.0**	**2.9**	**3.0**	**2.8**	**2.8**	**3.0**	**3.1**
Energy Use by End-Use (PJ)																				
Space Heating	1.7	1.7	1.8	1.7	1.6	1.5	1.5	1.8	1.9	2.0	2.0	2.2	1.9	1.9	1.8	2.0	1.7	1.8	1.9	1.9
Water Heating	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Appliances	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5
Lighting	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	62.9	62.1	62.1	61.6	62.1	60.7	59.8	61.8	64.7	65.5	62.9	64.2	61.0	61.9	63.4	65.0	62.0	63.2	61.8	62.3
Water Heating	21.0	21.4	21.3	21.1	19.7	19.7	20.8	20.5	18.5	18.3	20.5	20.3	21.1	19.3	17.5	16.9	17.3	16.4	17.6	17.2
Appliances	12.6	12.9	12.9	13.4	14.2	15.4	15.5	14.3	13.4	13.0	13.2	12.5	14.3	15.2	15.5	14.8	16.9	16.7	16.8	16.8
Lighting	3.4	3.5	3.6	3.8	3.8	4.0	3.8	3.3	3.1	3.0	3.1	2.9	3.3	3.4	3.3	3.1	3.4	3.4	3.3	3.3
Space Cooling	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.4	0.1	0.3	0.3	0.2	0.3	0.4	0.3	0.5	0.3
Activity																				
Total Floor Space (million m^2)	3.2	3.3	3.4	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.4	4.5	4.6	4.7	4.8	4.9	5.1	5.2
Total Households (thousands)	23.5	24.0	24.5	25.0	25.5	25.9	26.3	26.8	27.4	27.9	27.9	28.3	28.6	28.8	29.3	29.7	30.1	30.6	31.1	31.7
Energy Intensity (GJ/m^2)	**0.82**	**0.85**	**0.86**	**0.79**	**0.74**	**0.69**	**0.69**	**0.77**	**0.76**	**0.77**	**0.76**	**0.80**	**0.70**	**0.67**	**0.63**	**0.64**	**0.58**	**0.57**	**0.60**	**0.59**
Energy Intensity (GJ/household)	**112.7**	**117.0**	**117.9**	**108.7**	**102.1**	**96.5**	**96.8**	**109.1**	**108.8**	**110.4**	**112.1**	**119.5**	**106.7**	**104.5**	**98.3**	**101.0**	**91.6**	**92.7**	**97.1**	**96.3**
Total Single Attached GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
GHG Emissions by End-Use (Mt of CO_2e)																				
Space Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	75.9	75.3	75.4	75.4	76.8	76.3	74.5	74.7	77.4	77.6	74.6	75.0	73.1	74.8	77.1	78.1	77.2	78.5	76.6	77.3
Water Heating	24.1	24.7	24.6	24.6	23.2	23.7	25.5	25.3	22.6	22.3	25.3	24.9	26.8	25.1	22.7	21.8	22.7	21.3	23.2	22.5
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**40.6**	**41.1**	**41.4**	**40.5**	**37.5**	**35.6**	**36.8**	**38.6**	**38.7**	**38.5**	**39.7**	**40.4**	**37.6**	**34.4**	**32.7**	**32.6**	**29.9**	**30.0**	**30.8**	**30.9**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

Residential Sector

Nova Scotia[1]

Table 38: Apartments Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Apartments Energy Use (PJ)	**4.8**	**5.1**	**5.2**	**4.9**	**4.7**	**4.5**	**4.7**	**5.4**	**5.3**	**5.4**	**5.5**	**5.9**	**5.4**	**5.2**	**4.9**	**5.1**	**4.7**	**4.8**	**5.1**	**5.2**
Energy Use by Energy Source (PJ)																				
Electricity	1.8	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.4	2.4
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	2.4	2.6	2.7	2.5	2.2	1.9	2.1	2.5	2.5	2.5	2.7	3.0	2.5	2.2	1.9	1.9	1.5	1.6	1.8	1.8
Other[2]	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0
Wood	0.6	0.5	0.5	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.8	0.9	0.9
Shares (%)																				
Electricity	36.5	37.0	37.3	38.8	41.5	43.4	41.6	37.9	37.8	37.2	36.4	35.2	38.8	41.6	43.7	42.8	47.2	47.7	46.6	47.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.8
Heating Oil	50.1	51.0	51.9	50.8	46.1	42.6	44.5	47.1	47.2	46.6	49.2	50.8	46.4	41.1	38.2	37.2	32.9	33.2	35.0	34.9
Other[2]	1.0	1.3	1.3	1.5	1.3	1.9	2.0	1.6	1.8	1.8	1.8	1.3	1.1	1.0	0.9	1.1	1.1	1.0	0.2	0.1
Wood	12.4	10.6	9.5	8.9	11.1	12.0	11.9	13.4	13.1	13.7	12.2	12.6	13.4	15.9	16.6	18.3	18.2	17.4	17.5	17.1
Activity																				
Total Floor Space (million m^2)	6.6	6.7	6.8	7.0	7.1	7.3	7.4	7.6	7.8	7.9	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.6	9.8	10.1
Total Households (thousands)	78.6	79.3	80.2	81.0	81.8	82.5	83.1	83.8	84.9	85.9	85.3	85.7	86.2	86.2	87.0	87.7	88.1	89.0	90.1	91.1
Energy Intensity (GJ/m^2)	**0.73**	**0.76**	**0.76**	**0.70**	**0.66**	**0.63**	**0.63**	**0.71**	**0.69**	**0.69**	**0.69**	**0.72**	**0.64**	**0.61**	**0.56**	**0.56**	**0.51**	**0.50**	**0.52**	**0.51**
Energy Intensity (GJ/household)	**61.0**	**64.1**	**65.1**	**60.4**	**57.3**	**55.0**	**56.3**	**63.9**	**62.6**	**63.2**	**65.0**	**68.8**	**62.2**	**60.8**	**56.9**	**57.7**	**53.2**	**53.9**	**56.9**	**56.6**
Total Apartments GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.2**	**0.2**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.3	0.4	0.6	0.7	0.9	1.0	1.1	1.1	1.3
Heating Oil	90.9	91.6	92.3	92.3	90.5	88.3	88.7	89.0	88.8	87.6	89.3	90.3	89.2	86.5	85.2	83.4	81.7	82.4	84.5	84.7
Other[2]	1.6	2.1	2.1	2.3	2.3	3.4	3.4	2.7	3.0	2.9	2.8	2.0	1.9	1.8	1.8	2.2	2.3	2.2	0.4	0.3
Wood	7.5	6.3	5.6	5.4	7.2	8.3	7.9	8.4	8.2	8.5	7.3	7.4	8.5	11.1	12.3	13.6	15.0	14.3	13.9	13.8
GHG Intensity (tonne/TJ)	**39.0**	**39.5**	**39.8**	**39.0**	**36.1**	**34.2**	**35.6**	**37.5**	**37.7**	**37.7**	**39.1**	**39.9**	**36.9**	**33.7**	**31.8**	**31.7**	**28.6**	**28.6**	**29.4**	**29.2**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]
Table 39: Apartments Secondary Energy Use and GHG Emissions by End-Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Apartments Energy Use (PJ)	**4.8**	**5.1**	**5.2**	**4.9**	**4.7**	**4.5**	**4.7**	**5.4**	**5.3**	**5.4**	**5.5**	**5.9**	**5.4**	**5.2**	**4.9**	**5.1**	**4.7**	**4.8**	**5.1**	**5.2**
Energy Use by End-Use (PJ)																				
Space Heating	2.5	2.6	2.7	2.5	2.4	2.2	2.3	2.7	2.8	3.0	2.9	3.2	2.7	2.7	2.6	2.8	2.4	2.6	2.7	2.7
Water Heating	1.3	1.4	1.5	1.3	1.2	1.2	1.3	1.5	1.3	1.3	1.5	1.6	1.5	1.3	1.1	1.1	1.0	1.0	1.1	1.1
Appliances	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2
Lighting	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	51.2	50.7	50.9	50.6	51.1	49.5	48.3	50.0	53.6	54.7	52.2	53.8	50.3	51.2	52.9	55.1	51.9	53.3	51.8	52.3
Water Heating	27.9	28.3	27.9	27.4	25.8	25.9	27.5	27.8	25.2	24.7	27.1	26.7	27.4	25.1	22.8	21.4	21.5	20.4	21.7	21.2
Appliances	17.6	17.8	17.9	18.5	19.6	20.9	20.7	19.1	18.3	18.0	18.1	17.4	19.7	21.1	21.6	20.9	23.6	23.4	23.5	23.6
Lighting	3.2	3.2	3.2	3.4	3.5	3.6	3.4	3.0	2.7	2.4	2.2	1.9	2.3	2.4	2.4	2.3	2.6	2.5	2.5	2.5
Space Cooling	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.4
Activity																				
Total Floor Space (million m^2)	6.6	6.7	6.8	7.0	7.1	7.3	7.4	7.6	7.8	7.9	8.0	8.2	8.4	8.6	8.8	9.0	9.2	9.6	9.8	10.1
Total Households (thousands)	78.6	79.3	80.2	81.0	81.8	82.5	83.1	83.8	84.9	85.9	85.3	85.7	86.2	86.2	87.0	87.7	88.1	89.0	90.1	91.1
Energy Intensity (GJ/m^2)	**0.73**	**0.76**	**0.76**	**0.70**	**0.66**	**0.63**	**0.63**	**0.71**	**0.69**	**0.69**	**0.69**	**0.72**	**0.64**	**0.61**	**0.56**	**0.56**	**0.51**	**0.50**	**0.52**	**0.51**
Energy Intensity (GJ/household)	**61.0**	**64.1**	**65.1**	**60.4**	**57.3**	**55.0**	**56.3**	**63.9**	**62.6**	**63.2**	**65.0**	**68.8**	**62.2**	**60.8**	**56.9**	**57.7**	**53.2**	**53.9**	**56.9**	**56.6**
Total Apartments GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.2**	**0.2**
GHG Emissions by End-Use (Mt of CO_2e)																				
Space Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Water Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	65.5	65.1	65.5	65.7	67.3	66.4	63.9	63.8	67.6	68.2	65.0	65.8	63.4	65.5	68.4	70.4	69.1	70.8	68.5	69.3
Water Heating	34.5	34.9	34.5	34.3	32.7	33.6	36.1	36.2	32.4	31.6	34.9	34.1	36.5	34.3	31.4	29.3	30.6	28.9	31.1	30.3
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**39.0**	**39.5**	**39.8**	**39.0**	**36.1**	**34.2**	**35.6**	**37.5**	**37.7**	**37.7**	**39.1**	**39.9**	**36.9**	**33.7**	**31.8**	**31.7**	**28.6**	**28.6**	**29.4**	**29.2**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

Residential Sector

Nova Scotia[1]

Table 40: Mobile Homes Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Mobile Homes Energy Use (PJ)	**1.8**	**1.9**	**1.9**	**1.8**	**1.7**	**1.6**	**1.6**	**1.9**	**1.9**	**1.9**	**1.9**	**2.0**	**1.8**	**1.7**	**1.6**	**1.7**	**1.5**	**1.5**	**1.6**	**1.6**
Energy Use by Energy Source (PJ)																				
Electricity	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	1.0	1.1	1.1	1.0	0.9	0.8	0.8	1.0	1.0	1.0	1.0	1.1	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3
Shares (%)																				
Electricity	29.3	29.8	29.9	31.4	33.8	35.5	33.7	30.3	30.4	29.9	29.3	28.0	31.2	33.8	35.8	34.9	39.0	39.7	38.6	38.8
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1.0
Heating Oil	55.3	56.4	57.5	56.4	51.6	48.0	49.8	52.2	52.3	51.4	53.9	55.7	51.4	46.0	43.2	42.0	37.5	38.1	40.1	40.4
Other[2]	1.3	1.7	1.7	1.9	1.7	2.5	2.6	2.1	2.4	2.3	2.3	1.7	1.5	1.3	1.3	1.5	1.5	1.3	0.2	0.2
Wood	14.1	12.1	10.9	10.3	12.8	14.1	13.9	15.5	14.9	15.5	13.9	14.3	15.6	18.4	19.1	20.9	21.2	20.1	20.2	19.6
Activity																				
Total Floor Space (million m^2)	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7
Total Households (thousands)	14.5	14.5	14.5	14.6	14.6	14.7	14.7	14.7	14.8	14.9	14.7	14.7	14.6	14.6	14.6	14.6	14.6	14.7	14.8	14.9
Energy Intensity (GJ/m^2)	**1.30**	**1.35**	**1.36**	**1.24**	**1.16**	**1.09**	**1.09**	**1.24**	**1.24**	**1.25**	**1.22**	**1.28**	**1.11**	**1.06**	**1.00**	**1.02**	**0.90**	**0.91**	**0.95**	**0.94**
Energy Intensity (GJ/household)	**125.0**	**130.8**	**133.2**	**123.1**	**116.6**	**110.7**	**112.4**	**129.1**	**129.2**	**130.7**	**131.3**	**139.3**	**122.0**	**119.0**	**112.5**	**114.7**	**102.5**	**104.1**	**108.4**	**107.8**
Total Mobile Homes GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heating Oil	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.6	0.4	0.4	0.7	0.8	1.0	1.2	1.2	1.3	1.5
Heating Oil	90.5	91.1	91.8	91.7	90.0	87.6	87.9	88.3	88.2	86.9	88.5	89.7	88.5	85.8	84.6	82.8	80.9	81.9	84.2	84.6
Other[2]	1.8	2.4	2.4	2.7	2.6	3.9	3.9	3.1	3.4	3.4	3.3	2.3	2.2	2.2	2.1	2.5	2.8	2.5	0.4	0.4
Wood	7.7	6.5	5.8	5.6	7.4	8.5	8.1	8.7	8.3	8.7	7.6	7.6	8.9	11.4	12.4	13.7	15.2	14.3	14.0	13.6
GHG Intensity (tonne/TJ)	**43.3**	**43.9**	**44.3**	**43.6**	**40.7**	**38.8**	**40.2**	**41.9**	**42.1**	**42.0**	**43.2**	**44.0**	**41.3**	**38.0**	**36.2**	**36.0**	**32.9**	**32.9**	**33.8**	**33.8**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.
2) "Other" includes coal and propane.

Residential Sector

Nova Scotia[1]
Table 41: Mobile Homes Secondary Energy Use and GHG Emissions by End-Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Mobile Homes Energy Use (PJ)	**1.8**	**1.9**	**1.9**	**1.8**	**1.7**	**1.6**	**1.6**	**1.9**	**1.9**	**1.9**	**1.9**	**2.0**	**1.8**	**1.7**	**1.6**	**1.7**	**1.5**	**1.5**	**1.6**	**1.6**
Energy Use by End-Use (PJ)																				
Space Heating	1.3	1.3	1.4	1.3	1.2	1.1	1.1	1.3	1.4	1.4	1.4	1.5	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.2
Water Heating	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Appliances	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	70.2	69.9	70.2	69.9	69.8	68.1	66.8	68.1	71.5	72.9	71.4	73.4	70.4	70.8	72.1	74.3	71.6	72.4	71.2	71.7
Water Heating	16.1	16.3	16.0	15.8	15.3	16.0	17.6	18.0	15.4	14.4	15.5	14.6	15.5	14.2	12.8	11.1	11.5	10.8	11.7	11.4
Appliances	11.2	11.3	11.3	11.7	12.3	13.2	13.2	11.9	11.1	10.8	11.1	10.6	12.4	13.2	13.4	12.9	15.0	14.7	14.9	14.9
Lighting	2.4	2.4	2.4	2.5	2.5	2.5	2.2	1.8	1.6	1.4	1.4	1.2	1.4	1.5	1.5	1.4	1.6	1.6	1.6	1.6
Space Cooling	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.6	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.4
Activity																				
Total Floor Space (million m^2)	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7
Total Households (thousands)	14.5	14.5	14.5	14.6	14.6	14.7	14.7	14.7	14.8	14.9	14.7	14.7	14.6	14.6	14.6	14.6	14.6	14.7	14.8	14.9
Energy Intensity (GJ/m^2)	**1.30**	**1.35**	**1.36**	**1.24**	**1.16**	**1.09**	**1.09**	**1.24**	**1.24**	**1.25**	**1.22**	**1.28**	**1.11**	**1.06**	**1.00**	**1.02**	**0.90**	**0.91**	**0.95**	**0.94**
Energy Intensity (GJ/household)	**125.0**	**130.8**	**133.2**	**123.1**	**116.6**	**110.7**	**112.4**	**129.1**	**129.2**	**130.7**	**131.3**	**139.3**	**122.0**	**119.0**	**112.5**	**114.7**	**102.5**	**104.1**	**108.4**	**107.8**
Total Mobile Homes GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**
GHG Emissions by End-Use (Mt of CO_2e)																				
Space Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Space Heating	82.5	82.3	82.6	82.7	83.2	82.2	80.2	79.6	82.8	83.7	82.2	83.3	81.8	83.0	84.7	86.6	85.8	86.7	85.4	85.9
Water Heating	17.5	17.7	17.4	17.3	16.8	17.8	19.8	20.4	17.2	16.2	17.7	16.7	18.2	17.0	15.2	13.3	14.0	13.2	14.5	14.0
Appliances	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**43.3**	**43.9**	**44.3**	**43.6**	**40.7**	**38.8**	**40.2**	**41.9**	**42.1**	**42.0**	**43.2**	**44.0**	**41.3**	**38.0**	**36.2**	**36.0**	**32.9**	**32.9**	**33.8**	**33.8**
Heating Degree-Day Index	**0.94**	**0.94**	**0.97**	**0.99**	**1.02**	**0.94**	**0.83**	**0.81**	**0.99**	**1.02**	**0.89**	**0.95**	**0.83**	**0.87**	**0.98**	**1.04**	**0.96**	**1.04**	**0.96**	**1.00**
Cooling Degree-Day Index	**1.26**	**1.84**	**1.47**	**1.73**	**1.28**	**2.29**	**1.57**	**0.83**	**2.09**	**2.14**	**2.94**	**1.75**	**3.03**	**2.68**	**2.29**	**2.71**	**2.84**	**2.71**	**3.86**	**2.58**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production only.

Commercial/Institutional Sector
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1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 1: Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use (PJ)	**57.2**	**58.4**	**57.6**	**61.8**	**67.6**	**63.0**	**56.3**	**63.6**	**60.6**	**54.3**	**52.7**	**61.6**	**59.5**	**54.7**	**60.1**	**61.5**	**59.3**	**57.4**	**55.5**	**56.3**
Energy Use by Energy Source (PJ)																				
Electricity	29.9	30.2	31.1	31.7	32.0	30.9	27.7	33.5	33.6	33.2	31.3	32.9	33.3	30.4	34.6	34.3	35.1	34.9	36.1	36.0
Natural Gas	0.0	0.0	0.0	0.8	1.0	1.6	1.5	1.6	2.5	2.7	2.8	5.3	5.5	6.6	6.7	7.3	8.1	9.6	10.1	10.5
Light Fuel Oil and Kerosene	15.6	16.5	16.5	16.7	19.2	14.9	12.2	12.2	10.3	8.3	9.2	11.7	8.6	13.2	14.0	14.5	11.9	9.7	7.0	7.2
Heavy Fuel Oil	7.2	6.3	4.9	7.7	10.7	11.4	10.4	11.5	9.0	5.0	4.8	7.6	8.8	1.4	1.4	1.5	1.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	4.5	5.4	5.1	4.9	4.7	4.1	4.5	4.7	5.3	5.0	4.5	4.0	3.2	3.1	3.4	3.9	3.3	3.1	2.4	2.6
Shares (%)																				
Electricity	52.3	51.6	54.0	51.3	47.4	49.1	49.3	52.7	55.4	61.2	59.5	53.5	56.0	55.6	57.6	55.8	59.1	60.8	65.0	63.9
Natural Gas	0.0	0.0	0.0	1.3	1.4	2.6	2.6	2.6	4.2	5.0	5.4	8.6	9.3	12.1	11.1	11.8	13.6	16.8	18.1	18.7
Light Fuel Oil and Kerosene	27.3	28.3	28.6	26.9	28.5	23.7	21.7	19.3	16.9	15.3	17.5	19.0	14.5	24.1	23.4	23.5	20.0	16.9	12.6	12.8
Heavy Fuel Oil	12.6	10.8	8.5	12.4	15.8	18.1	18.4	18.1	14.8	9.3	9.2	12.3	14.8	2.6	2.3	2.5	1.6	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	7.8	9.3	8.9	8.0	7.0	6.5	8.0	7.3	8.7	9.3	8.5	6.5	5.5	5.6	5.7	6.3	5.6	5.5	4.3	4.5
Activity																				
Total Floor Space (million m^2)	41.9	42.7	43.1	43.8	44.4	45.1	45.8	46.3	46.8	47.4	47.8	48.3	48.9	49.2	49.2	49.2	49.1	49.3	49.3	49.0
Energy Intensity[3] (GJ/m^2)	**1.35**	**1.35**	**1.32**	**1.39**	**1.50**	**1.38**	**1.21**	**1.35**	**1.28**	**1.13**	**1.08**	**1.26**	**1.20**	**1.09**	**1.20**	**1.23**	**1.19**	**1.15**	**1.11**	**1.13**
Total GHG Emissions <u>Excluding</u> Electricity (Mt of CO_2e)	**1.9**	**2.0**	**1.8**	**2.1**	**2.5**	**2.2**	**2.0**	**2.1**	**1.8**	**1.4**	**1.4**	**1.9**	**1.7**	**1.5**	**1.6**	**1.7**	**1.5**	**1.3**	**1.1**	**1.2**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5
Light Fuel Oil and Kerosene	1.1	1.2	1.2	1.2	1.4	1.1	0.9	0.9	0.7	0.6	0.7	0.8	0.6	0.9	1.0	1.0	0.8	0.7	0.5	0.5
Heavy Fuel Oil	0.5	0.5	0.4	0.6	0.8	0.8	0.8	0.9	0.7	0.4	0.4	0.6	0.7	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
GHG Intensity (tonne/TJ)	**33.5**	**33.8**	**32.1**	**33.9**	**36.9**	**35.6**	**35.4**	**32.9**	**30.4**	**25.8**	**27.1**	**30.9**	**29.2**	**28.1**	**26.8**	**27.9**	**25.2**	**23.3**	**20.1**	**20.8**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) Data on GHG emissions are presented <u>excluding</u> GHG emissions related to electricity production.
2) "Other" includes coal and propane.
3) Excludes street lighting.

Commercial/Institutional Sector

Atlantic[1]

Table 2: Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use (PJ)	**57.2**	**58.4**	**57.6**	**61.8**	**67.6**	**63.0**	**56.3**	**63.6**	**60.6**	**54.3**	**52.7**	**61.6**	**59.5**	**54.7**	**60.1**	**61.5**	**59.3**	**57.4**	**55.5**	**56.3**
Energy Use by End Use (PJ)																				
Space Heating	29.0	28.9	29.2	30.2	36.4	31.5	27.2	32.8	29.3	23.9	21.5	30.1	27.6	25.0	27.9	29.4	27.6	26.4	22.3	23.8
Water Heating	3.1	3.0	2.9	3.6	3.8	3.4	3.1	3.5	3.3	2.9	3.1	3.9	4.0	3.1	3.3	3.3	2.9	2.5	2.7	2.7
Auxiliary Equipment	7.1	7.8	7.6	8.9	9.2	9.3	9.3	9.9	10.0	10.5	10.8	10.5	9.9	9.9	10.7	10.4	10.8	9.4	10.1	10.7
Auxiliary Motors	3.9	3.3	3.2	3.4	3.5	3.4	2.8	3.0	3.0	3.3	2.8	3.5	2.8	2.2	3.0	2.8	2.6	2.7	2.3	2.3
Lighting	10.4	10.5	10.3	10.2	10.4	10.0	9.8	10.4	10.4	10.3	10.4	10.0	9.2	9.3	9.9	9.8	9.3	10.1	10.4	10.9
Space Cooling	3.0	4.2	3.7	4.6	3.5	4.6	3.4	3.1	3.6	2.5	3.0	2.6	5.0	4.4	4.4	5.1	5.4	5.5	6.9	5.2
Street Lighting	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7
Shares (%)																				
Space Heating	50.7	49.6	50.8	48.8	53.9	50.0	48.3	51.6	48.4	44.0	40.9	48.9	46.4	45.6	46.5	47.8	46.5	45.9	40.2	42.3
Water Heating	5.5	5.1	5.0	5.9	5.6	5.5	5.5	5.5	5.5	5.4	6.0	6.4	6.8	5.6	5.5	5.4	4.9	4.4	4.9	4.7
Auxiliary Equipment	12.5	13.3	13.2	14.5	13.6	14.8	16.6	15.6	16.6	19.3	20.5	17.1	16.7	18.2	17.8	16.9	18.1	16.4	18.2	19.0
Auxiliary Motors	6.7	5.6	5.6	5.5	5.2	5.3	5.0	4.7	5.0	6.2	5.2	5.6	4.7	4.1	4.9	4.5	4.3	4.7	4.2	4.0
Lighting	18.2	17.9	17.8	16.6	15.4	15.9	17.3	16.3	17.1	19.0	19.8	16.3	15.4	16.9	16.4	15.9	15.7	17.6	18.7	19.3
Space Cooling	5.3	7.2	6.4	7.4	5.2	7.3	6.0	4.9	5.9	4.6	5.8	4.2	8.5	8.0	7.3	8.3	9.0	9.7	12.5	9.3
Street Lighting	1.2	1.3	1.2	1.4	1.1	1.2	1.3	1.4	1.5	1.7	1.8	1.5	1.5	1.6	1.5	1.3	1.3	1.3	1.3	1.3
Activity																				
Total Floor Space (million m^2)	41.9	42.7	43.1	43.8	44.4	45.1	45.8	46.3	46.8	47.4	47.8	48.3	48.9	49.2	49.2	49.2	49.1	49.3	49.3	49.0
Energy Intensity[2] (GJ/m^2)	**1.35**	**1.35**	**1.32**	**1.39**	**1.50**	**1.38**	**1.21**	**1.35**	**1.28**	**1.13**	**1.08**	**1.26**	**1.20**	**1.09**	**1.20**	**1.23**	**1.19**	**1.15**	**1.11**	**1.13**
Total GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.9**	**2.0**	**1.8**	**2.1**	**2.5**	**2.2**	**2.0**	**2.1**	**1.8**	**1.4**	**1.4**	**1.9**	**1.7**	**1.5**	**1.6**	**1.7**	**1.5**	**1.3**	**1.1**	**1.2**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	1.7	1.7	1.6	1.8	2.2	2.0	1.7	1.8	1.6	1.2	1.2	1.6	1.4	1.3	1.4	1.5	1.3	1.2	0.9	1.0
Water Heating	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Auxiliary Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Street Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**33.5**	**33.8**	**32.1**	**33.9**	**36.9**	**35.6**	**35.4**	**32.9**	**30.4**	**25.8**	**27.1**	**30.9**	**29.2**	**28.1**	**26.8**	**27.9**	**25.2**	**23.3**	**20.1**	**20.8**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) Excludes street lighting.

Commercial/Institutional Sector

Atlantic[1]

Table 3: Secondary Energy Use and GHG Emissions by Activity Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use (PJ)	**57.2**	**58.4**	**57.6**	**61.8**	**67.6**	**63.0**	**56.3**	**63.6**	**60.6**	**54.3**	**52.7**	**61.6**	**59.5**	**54.7**	**60.1**	**61.5**	**59.3**	**57.4**	**55.5**	**56.3**
Energy Use by Activity Type[2] (PJ)																				
Wholesale Trade	3.3	3.3	3.3	3.4	4.0	3.6	3.2	3.7	3.5	3.1	2.8	3.5	3.4	3.1	3.4	3.4	3.3	3.1	3.0	3.0
Retail Trade	8.4	8.8	8.7	9.2	10.9	10.6	9.5	11.0	10.4	9.2	8.4	10.3	10.3	9.4	10.2	10.5	10.1	9.6	9.2	9.3
Transportation and Warehousing	2.4	2.4	2.4	2.3	2.7	2.4	2.1	2.3	2.2	1.9	1.8	2.3	2.2	2.0	2.2	2.2	2.1	2.1	1.9	2.0
Information and Cultural Industries	1.1	1.1	1.1	1.2	1.4	1.2	1.1	1.2	1.2	1.1	1.0	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.1
Offices[3]	18.5	18.9	18.6	21.5	19.6	19.3	17.1	19.0	18.6	17.1	18.8	19.7	17.6	16.1	17.6	18.1	17.5	17.0	16.5	16.7
Educational Services	8.3	8.4	8.2	8.6	10.4	9.2	8.1	9.1	8.5	7.6	7.1	8.7	8.6	7.9	8.8	9.1	8.8	8.6	8.3	8.4
Health Care and Social Assistance	8.5	8.6	8.4	8.5	10.2	9.2	8.3	9.3	8.7	7.7	6.8	8.6	8.8	8.3	9.3	9.5	9.2	8.7	8.5	8.6
Arts, Entertainment and Recreation	1.0	1.0	1.0	1.0	1.2	1.1	1.0	1.1	1.0	0.9	0.9	1.1	1.1	1.0	1.1	1.2	1.1	1.1	1.1	1.1
Accommodation and Food Services	3.8	3.8	3.8	3.9	4.8	4.4	4.0	4.6	4.3	3.8	3.3	4.1	4.3	3.9	4.3	4.5	4.4	4.4	4.3	4.4
Other Services	1.4	1.4	1.4	1.4	1.6	1.4	1.2	1.4	1.3	1.1	1.0	1.2	1.1	1.0	1.1	1.1	1.0	0.9	0.9	0.9
Shares (%)																				
Wholesale Trade	5.8	5.8	5.8	5.6	6.1	5.8	5.8	5.9	5.9	5.8	5.4	5.7	5.8	5.8	5.7	5.6	5.6	5.5	5.5	5.4
Retail Trade	14.8	15.2	15.3	15.0	16.3	17.0	17.1	17.5	17.4	17.2	16.2	17.0	17.6	17.5	17.3	17.3	17.2	16.9	16.8	16.8
Transportation and Warehousing	4.3	4.2	4.1	3.8	4.1	3.8	3.7	3.7	3.7	3.6	3.5	3.7	3.8	3.7	3.7	3.6	3.6	3.6	3.5	3.6
Information and Cultural Industries	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0
Offices[3]	32.7	32.7	32.8	35.3	29.3	31.0	30.8	30.3	31.2	32.1	36.4	32.4	30.0	29.9	29.7	29.8	29.9	29.9	30.0	30.1
Educational Services	14.6	14.5	14.5	14.0	15.5	14.8	14.7	14.6	14.3	14.2	13.6	14.4	14.7	14.7	14.9	15.0	15.0	15.1	15.2	15.1
Health Care and Social Assistance	14.9	14.9	14.8	14.0	15.3	14.7	14.9	14.8	14.5	14.3	13.1	14.2	15.1	15.5	15.7	15.6	15.7	15.4	15.5	15.5
Arts, Entertainment and Recreation	1.7	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.9	1.9	1.9	1.9	2.0	1.9	2.0
Accommodation and Food Services	6.7	6.7	6.7	6.4	7.2	7.0	7.2	7.3	7.2	7.0	6.3	6.8	7.3	7.3	7.3	7.5	7.5	7.8	7.9	7.9
Other Services (Except Public Admin)	2.5	2.4	2.4	2.3	2.4	2.2	2.2	2.2	2.1	2.0	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6
Activity																				
Total Floor Space (million m^2)	41.9	42.7	43.1	43.8	44.4	45.1	45.8	46.3	46.8	47.4	47.8	48.3	48.9	49.2	49.2	49.2	49.1	49.3	49.3	49.0
Energy Intensity[2] (GJ/m^2)	**1.35**	**1.35**	**1.32**	**1.39**	**1.50**	**1.38**	**1.21**	**1.35**	**1.28**	**1.13**	**1.08**	**1.26**	**1.20**	**1.09**	**1.20**	**1.23**	**1.19**	**1.15**	**1.11**	**1.13**
Total GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.9**	**2.0**	**1.8**	**2.1**	**2.5**	**2.2**	**2.0**	**2.1**	**1.8**	**1.4**	**1.4**	**1.9**	**1.7**	**1.5**	**1.6**	**1.7**	**1.5**	**1.3**	**1.1**	**1.2**
GHG Emissions by Activity Type[2] (Mt of CO_2e)																				
Wholesale Trade	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Retail Trade	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Transportation and Warehousing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Information and Cultural Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offices[3]	0.7	0.7	0.7	0.8	0.8	0.7	0.6	0.7	0.7	0.6	0.7	0.8	0.6	0.5	0.6	0.6	0.5	0.5	0.4	0.4
Educational Services	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2
Health Care and Social Assistance	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Arts, Entertainment and Recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation and Food Services	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Services	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**33.5**	**33.8**	**32.1**	**33.9**	**36.9**	**35.6**	**35.4**	**32.9**	**30.4**	**25.8**	**27.1**	**30.9**	**29.2**	**28.1**	**26.8**	**27.9**	**25.2**	**23.3**	**20.1**	**20.8**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) Excludes street lighting.
3) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 4: Wholesale Trade Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Wholesale Trade (PJ)	**3.3**	**3.3**	**3.3**	**3.4**	**4.0**	**3.6**	**3.2**	**3.7**	**3.5**	**3.1**	**2.8**	**3.5**	**3.4**	**3.1**	**3.4**	**3.4**	**3.3**	**3.1**	**3.0**	**3.0**
Energy Use by Energy Source (PJ)																				
Electricity	1.8	1.7	1.8	1.8	1.9	1.8	1.5	2.0	2.1	2.0	1.8	2.0	2.0	1.8	2.1	2.1	2.1	2.1	2.2	2.2
Natural Gas	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6
Light Fuel Oil and Kerosene	0.9	1.0	1.0	1.0	1.3	1.0	0.7	0.6	0.3	0.1	0.2	0.3	0.1	0.4	0.4	0.4	0.3	0.2	0.1	0.1
Heavy Fuel Oil	0.2	0.1	0.0	0.1	0.4	0.4	0.5	0.5	0.4	0.2	0.1	0.2	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2
Shares (%)																				
Electricity	54.1	52.3	55.6	53.2	47.6	49.4	48.2	54.9	58.7	66.3	65.0	59.0	59.1	58.4	63.5	61.6	63.1	67.6	72.0	71.1
Natural Gas	0.0	0.0	0.0	1.5	2.0	3.7	3.8	3.9	7.1	9.0	10.4	15.8	16.1	20.7	15.1	15.8	18.8	19.8	19.9	20.4
Light Fuel Oil and Kerosene	28.8	30.6	30.4	29.7	31.5	26.6	22.8	17.0	9.3	4.2	6.3	9.3	4.3	12.1	12.0	11.6	8.2	5.0	3.0	2.9
Heavy Fuel Oil	5.9	3.1	1.0	4.0	8.9	11.5	14.2	14.2	12.6	6.3	4.5	6.0	13.0	0.9	1.5	2.0	1.2	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	11.2	14.0	13.1	11.7	9.9	8.9	10.9	10.0	12.2	14.3	13.8	9.9	7.5	8.0	7.9	9.0	8.8	7.5	5.2	5.6
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (GJ/m^2)	**1.18**	**1.18**	**1.15**	**1.19**	**1.38**	**1.20**	**1.06**	**1.20**	**1.11**	**0.98**	**0.89**	**1.09**	**1.06**	**0.97**	**1.07**	**1.08**	**1.04**	**0.99**	**0.96**	**0.98**
Total GHG Emissions for Wholesale Trade Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**31.7**	**32.6**	**30.3**	**31.9**	**36.1**	**34.7**	**35.4**	**30.7**	**27.0**	**20.9**	**21.4**	**24.9**	**25.3**	**24.2**	**21.7**	**22.8**	**21.1**	**17.8**	**14.9**	**15.4**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 5: Wholesale Trade Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Wholesale Trade (PJ)	**3.3**	**3.3**	**3.3**	**3.4**	**4.0**	**3.6**	**3.2**	**3.7**	**3.5**	**3.1**	**2.8**	**3.5**	**3.4**	**3.1**	**3.4**	**3.4**	**3.3**	**3.1**	**3.0**	**3.0**
Energy Use by End Use (PJ)																				
Space Heating	1.7	1.7	1.8	1.7	2.3	1.9	1.6	2.0	1.8	1.4	1.1	1.7	1.7	1.5	1.7	1.7	1.6	1.5	1.3	1.3
Water Heating	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Auxiliary Equipment	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Auxiliary Motors	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Lighting	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Space Cooling	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
Shares (%)																				
Space Heating	53.1	52.1	53.5	50.2	57.1	52.0	50.9	54.7	51.0	46.1	40.5	49.3	49.0	48.2	49.0	49.3	48.1	47.9	41.9	44.4
Water Heating	5.6	5.3	5.2	6.2	5.6	5.6	5.6	5.5	5.6	5.6	6.3	6.5	6.8	5.6	5.4	5.3	4.8	4.5	5.0	4.8
Auxiliary Equipment	10.7	11.4	11.2	12.8	11.5	12.6	13.9	13.1	14.1	17.2	19.0	16.0	14.6	16.3	16.1	15.5	16.6	14.7	16.3	17.1
Auxiliary Motors	7.2	6.0	6.0	6.0	5.4	5.8	5.5	5.1	5.5	6.8	6.1	6.2	5.1	4.4	5.3	4.9	4.7	5.0	4.5	4.4
Lighting	17.6	17.4	17.2	16.5	14.6	15.8	17.2	16.0	17.0	19.0	21.0	17.1	14.9	16.4	15.9	15.6	15.5	16.8	17.9	18.5
Space Cooling	5.8	7.8	6.9	8.3	5.7	8.3	6.9	5.6	6.8	5.3	7.1	4.9	9.5	9.0	8.2	9.4	10.3	11.1	14.4	10.8
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (GJ/m^2)	**1.18**	**1.18**	**1.15**	**1.19**	**1.38**	**1.20**	**1.06**	**1.20**	**1.11**	**0.98**	**0.89**	**1.09**	**1.06**	**0.97**	**1.07**	**1.08**	**1.04**	**0.99**	**0.96**	**0.98**
Total GHG Emissions for Wholesale Trade Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**31.7**	**32.6**	**30.3**	**31.9**	**36.1**	**34.7**	**35.4**	**30.7**	**27.0**	**20.9**	**21.4**	**24.9**	**25.3**	**24.2**	**21.7**	**22.8**	**21.1**	**17.8**	**14.9**	**15.4**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 6: Retail Trade Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Retail Trade (PJ)	**8.4**	**8.8**	**8.7**	**9.2**	**10.9**	**10.6**	**9.5**	**11.0**	**10.4**	**9.2**	**8.4**	**10.3**	**10.3**	**9.4**	**10.2**	**10.5**	**10.1**	**9.6**	**9.2**	**9.3**
Energy Use by Energy Source (PJ)																				
Electricity	4.7	4.8	5.0	5.1	5.4	5.2	4.5	6.0	6.1	6.1	5.4	6.1	6.1	5.5	6.5	6.4	6.2	6.4	6.6	6.6
Natural Gas	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.7	0.8	0.9	1.7	1.7	2.0	1.6	1.7	2.0	2.0	1.9	2.0
Light Fuel Oil and Kerosene	2.3	2.5	2.5	2.6	3.3	2.8	2.2	1.9	1.0	0.4	0.5	1.0	0.4	1.1	1.2	1.3	0.8	0.5	0.3	0.3
Heavy Fuel Oil	0.5	0.3	0.1	0.3	0.9	1.2	1.4	1.6	1.3	0.6	0.4	0.6	1.4	0.1	0.2	0.2	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.9	1.2	1.1	1.0	1.0	0.9	1.0	1.1	1.3	1.3	1.1	1.0	0.8	0.7	0.8	0.9	0.9	0.7	0.5	0.5
Shares (%)																				
Electricity	56.3	54.6	57.7	55.3	49.7	49.5	47.7	54.6	58.4	66.0	64.8	58.7	58.8	58.2	63.3	60.7	62.0	67.0	71.4	70.6
Natural Gas	0.0	0.0	0.0	1.4	2.0	3.7	3.8	3.9	7.2	9.1	10.6	16.1	16.3	21.0	15.3	16.3	19.5	20.5	20.5	21.0
Light Fuel Oil and Kerosene	27.5	29.1	28.9	28.3	30.3	26.6	23.1	17.3	9.5	4.3	6.4	9.4	4.3	12.2	12.1	11.9	8.4	5.2	3.0	3.0
Heavy Fuel Oil	5.6	2.9	0.9	3.8	8.5	11.5	14.4	14.2	12.7	6.4	4.6	6.0	13.2	0.9	1.5	2.1	1.2	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	10.7	13.4	12.5	11.2	9.6	8.8	10.9	10.0	12.2	14.2	13.7	9.7	7.3	7.8	7.7	9.0	8.9	7.4	5.0	5.4
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (GJ/m^2)	**1.37**	**1.37**	**1.34**	**1.38**	**1.59**	**1.52**	**1.33**	**1.49**	**1.39**	**1.22**	**1.11**	**1.36**	**1.33**	**1.22**	**1.34**	**1.38**	**1.33**	**1.27**	**1.23**	**1.25**
Total GHG Emissions for Retail Trade Excluding Electricity (Mt of CO_2e)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Light Fuel Oil and Kerosene	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**30.2**	**31.0**	**28.8**	**30.5**	**34.7**	**34.6**	**35.7**	**30.9**	**27.2**	**21.0**	**21.5**	**25.1**	**25.5**	**24.2**	**21.8**	**23.3**	**21.7**	**18.1**	**15.2**	**15.6**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 7: Retail Trade Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Retail Trade (PJ)	**8.4**	**8.8**	**8.7**	**9.2**	**10.9**	**10.6**	**9.5**	**11.0**	**10.4**	**9.2**	**8.4**	**10.3**	**10.3**	**9.4**	**10.2**	**10.5**	**10.1**	**9.6**	**9.2**	**9.3**
Energy Use by End Use (PJ)																				
Space Heating	4.2	4.3	4.4	4.4	5.9	5.5	4.9	6.0	5.3	4.3	3.4	5.1	5.1	4.6	5.0	5.3	5.0	4.7	4.0	4.2
Water Heating	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5
Auxiliary Equipment	0.9	1.0	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.4	1.4	1.5	1.4	1.5	1.3	1.4	1.5
Auxiliary Motors	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.3
Lighting	1.7	1.8	1.8	1.8	1.9	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.7	1.7	1.8	1.8	1.7	1.7	1.7	1.8
Space Cooling	0.5	0.7	0.6	0.8	0.7	0.9	0.6	0.6	0.7	0.5	0.6	0.5	1.0	0.8	0.8	1.0	1.0	1.0	1.3	1.0
Shares (%)																				
Space Heating	50.2	49.2	50.6	47.6	54.5	51.8	51.3	54.8	51.1	46.4	40.8	49.7	49.3	48.5	49.3	50.5	49.4	49.0	43.0	45.4
Water Heating	5.6	5.3	5.2	6.2	5.7	5.8	5.9	5.8	5.9	5.9	6.6	6.8	7.2	5.9	5.7	5.6	5.1	4.7	5.3	5.1
Auxiliary Equipment	10.4	11.1	11.0	12.3	11.2	11.2	12.4	11.8	12.7	15.5	17.1	14.4	13.2	14.7	14.6	13.7	14.7	13.7	15.2	15.9
Auxiliary Motors	6.8	5.7	5.6	5.7	5.1	5.1	4.8	4.5	4.8	6.0	5.4	5.5	4.5	3.9	4.7	4.3	4.1	4.2	3.8	3.7
Lighting	20.9	20.6	20.4	19.5	17.4	17.2	18.9	17.6	18.8	21.0	23.1	18.9	16.4	18.1	17.6	16.8	16.7	17.7	18.8	19.5
Space Cooling	6.0	8.1	7.2	8.7	6.0	9.0	6.7	5.5	6.6	5.2	6.9	4.8	9.4	8.9	8.1	9.1	10.0	10.7	13.9	10.4
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (GJ/m^2)	**1.37**	**1.37**	**1.34**	**1.38**	**1.59**	**1.52**	**1.33**	**1.49**	**1.39**	**1.22**	**1.11**	**1.36**	**1.33**	**1.22**	**1.34**	**1.38**	**1.33**	**1.27**	**1.23**	**1.25**
Total GHG Emissions for Retail Trade Excluding Electricity (Mt of CO_2e)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**30.2**	**31.0**	**28.8**	**30.5**	**34.7**	**34.6**	**35.7**	**30.9**	**27.2**	**21.0**	**21.5**	**25.1**	**25.5**	**24.2**	**21.8**	**23.3**	**21.7**	**18.1**	**15.2**	**15.6**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 8: Transportation and Warehousing Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Transportation and Warehousing (PJ)	**2.4**	**2.4**	**2.4**	**2.3**	**2.7**	**2.4**	**2.1**	**2.3**	**2.2**	**1.9**	**1.8**	**2.3**	**2.2**	**2.0**	**2.2**	**2.2**	**2.1**	**2.1**	**1.9**	**2.0**
Energy Use by Energy Source (PJ)																				
Electricity	1.2	1.2	1.2	1.2	1.2	1.1	0.9	1.2	1.3	1.3	1.1	1.3	1.3	1.1	1.4	1.3	1.3	1.4	1.4	1.4
Natural Gas	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4
Light Fuel Oil and Kerosene	0.8	0.8	0.8	0.7	0.9	0.7	0.5	0.4	0.2	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.2	0.1	0.1	0.1
Heavy Fuel Oil	0.2	0.1	0.0	0.1	0.3	0.3	0.3	0.4	0.3	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Shares (%)																				
Electricity	50.1	47.6	52.0	50.5	45.1	46.6	45.3	53.9	57.5	65.1	63.2	57.4	57.6	56.2	62.2	60.0	60.5	67.5	72.1	71.2
Natural Gas	0.0	0.0	0.0	1.7	2.2	4.1	4.2	4.2	7.7	9.7	11.4	16.8	17.1	21.5	15.4	16.2	19.8	20.3	20.4	20.9
Light Fuel Oil and Kerosene	32.0	34.4	33.6	31.7	33.3	28.1	24.3	17.0	9.5	4.5	6.8	9.9	4.7	13.6	13.3	12.9	9.1	5.5	3.3	3.2
Heavy Fuel Oil	6.8	3.7	1.1	4.5	9.7	12.7	15.8	15.3	13.5	6.5	4.9	6.3	13.5	1.0	1.7	2.3	1.3	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	11.2	14.3	13.2	11.6	9.7	8.6	10.5	9.6	11.8	14.1	13.7	9.5	7.1	7.6	7.4	8.7	9.2	6.7	4.3	4.6
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (GJ/m^2)	**1.03**	**1.03**	**1.00**	**0.98**	**1.14**	**0.98**	**0.85**	**0.93**	**0.87**	**0.77**	**0.71**	**0.89**	**0.87**	**0.79**	**0.88**	**0.88**	**0.84**	**0.83**	**0.79**	**0.80**
Total GHG Emissions for Transportation and Warehousing Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**34.6**	**35.9**	**32.8**	**33.8**	**37.9**	**36.7**	**37.5**	**31.4**	**27.9**	**21.5**	**22.5**	**25.9**	**26.2**	**25.5**	**22.6**	**23.8**	**22.7**	**17.8**	**14.8**	**15.2**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 9: Transportation and Warehousing Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Transportation and Warehousing (PJ)	**2.4**	**2.4**	**2.4**	**2.3**	**2.7**	**2.4**	**2.1**	**2.3**	**2.2**	**1.9**	**1.8**	**2.3**	**2.2**	**2.0**	**2.2**	**2.2**	**2.1**	**2.1**	**1.9**	**2.0**
Energy Use by End Use (PJ)																				
Space Heating	1.5	1.5	1.5	1.3	1.8	1.4	1.2	1.4	1.3	1.0	0.8	1.3	1.2	1.1	1.2	1.2	1.1	1.1	0.9	1.0
Water Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Auxiliary Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Auxiliary Motors	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Lighting	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Space Cooling	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Shares (%)																				
Space Heating	62.9	61.8	62.6	57.7	63.9	58.8	57.7	60.1	57.1	52.8	47.2	56.0	55.8	55.1	55.6	55.5	54.5	52.6	47.1	49.5
Water Heating	3.0	2.8	2.8	3.5	3.2	3.2	3.3	3.3	3.4	3.3	3.9	3.9	4.1	3.4	3.3	3.3	3.0	2.7	3.1	3.0
Auxiliary Equipment	2.3	3.4	3.4	5.6	4.9	5.5	6.0	5.8	6.2	7.4	8.4	6.9	7.3	8.2	8.0	7.8	8.4	7.6	8.6	9.0
Auxiliary Motors	8.6	7.2	7.2	7.6	6.8	7.5	7.1	6.8	7.3	9.1	8.4	8.3	6.8	5.9	7.1	6.6	6.4	7.0	6.4	6.1
Lighting	18.9	18.7	18.7	18.8	16.5	18.2	20.1	19.2	20.4	22.8	25.9	20.6	18.0	19.9	19.2	18.9	18.9	21.0	22.8	23.5
Space Cooling	4.4	6.0	5.4	6.8	4.6	6.8	5.8	4.8	5.8	4.5	6.2	4.3	8.0	7.5	6.9	7.9	8.7	9.1	12.1	9.0
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (GJ/m^2)	**1.03**	**1.03**	**1.00**	**0.98**	**1.14**	**0.98**	**0.85**	**0.93**	**0.87**	**0.77**	**0.71**	**0.89**	**0.87**	**0.79**	**0.88**	**0.88**	**0.84**	**0.83**	**0.79**	**0.80**
Total GHG Emissions for Transportation and Warehousing Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**34.6**	**35.9**	**32.8**	**33.8**	**37.9**	**36.7**	**37.5**	**31.4**	**27.9**	**21.5**	**22.5**	**25.9**	**26.2**	**25.5**	**22.6**	**23.8**	**22.7**	**17.8**	**14.8**	**15.2**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 10: Information and Cultural Industries Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Information and Cultural Industries (PJ)	**1.1**	**1.1**	**1.1**	**1.2**	**1.4**	**1.2**	**1.1**	**1.2**	**1.2**	**1.1**	**1.0**	**1.2**	**1.2**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**	**1.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.8	0.8	0.7	0.6	0.7	0.7	0.6	0.8	0.8	0.7	0.8	0.8	0.8
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Light Fuel Oil and Kerosene	0.3	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Heavy Fuel Oil	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	54.9	51.2	54.3	56.7	53.1	57.0	56.1	63.6	64.3	66.9	65.8	59.9	59.9	59.6	64.7	62.1	63.5	68.6	72.9	72.1
Natural Gas	0.0	0.0	0.0	1.5	2.1	3.8	4.0	4.1	7.1	8.6	10.0	15.4	16.6	19.8	14.3	15.3	18.2	19.1	19.2	19.6
Light Fuel Oil and Kerosene	28.2	32.1	31.9	25.9	25.6	17.8	13.2	6.9	3.6	4.1	6.0	9.1	4.3	11.4	11.2	11.1	7.8	4.7	2.8	2.7
Heavy Fuel Oil	5.4	2.9	0.9	3.8	8.5	11.2	14.4	14.2	11.4	4.9	3.6	5.0	10.2	0.9	1.5	2.0	1.2	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	11.4	13.8	12.9	12.1	10.8	10.2	12.4	11.2	13.6	15.4	14.6	10.7	9.0	8.3	8.3	9.6	9.3	7.6	5.2	5.5
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (GJ/m^2)	**1.55**	**1.55**	**1.52**	**1.57**	**1.81**	**1.59**	**1.40**	**1.58**	**1.48**	**1.30**	**1.19**	**1.45**	**1.41**	**1.29**	**1.42**	**1.46**	**1.41**	**1.37**	**1.33**	**1.35**
Total GHG Emissions for Information and Cultural Industries Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**31.1**	**33.4**	**31.2**	**29.4**	**32.1**	**29.1**	**29.6**	**24.4**	**22.9**	**20.3**	**20.8**	**24.3**	**24.3**	**23.4**	**21.0**	**22.5**	**20.9**	**17.2**	**14.4**	**14.8**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 11: Information and Cultural Industries Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Information and Cultural Industries (PJ)	**1.1**	**1.1**	**1.1**	**1.2**	**1.4**	**1.2**	**1.1**	**1.2**	**1.2**	**1.1**	**1.0**	**1.2**	**1.2**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**	**1.1**
Energy Use by End Use (PJ)																				
Space Heating	0.6	0.6	0.6	0.6	0.8	0.6	0.5	0.7	0.6	0.5	0.4	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.5
Water Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Auxiliary Equipment	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Auxiliary Motors	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0
Lighting	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Space Cooling	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Shares (%)																				
Space Heating	51.4	50.5	51.8	48.6	55.5	50.4	49.3	53.1	49.3	44.4	38.9	47.6	47.4	46.6	47.3	48.6	47.4	46.4	40.5	42.8
Water Heating	6.1	5.7	5.6	6.7	6.1	6.1	6.1	6.0	6.1	6.0	6.8	7.0	7.4	6.1	5.9	5.7	5.2	4.8	5.3	5.1
Auxiliary Equipment	11.9	12.7	12.6	14.1	12.7	13.9	15.2	14.4	15.5	18.8	20.7	17.5	16.0	17.9	17.7	16.7	17.9	16.4	18.1	19.0
Auxiliary Motors	7.0	5.8	5.8	5.8	5.2	5.7	5.3	4.9	5.3	6.6	5.8	6.0	4.9	4.2	5.1	4.7	4.5	4.9	4.4	4.2
Lighting	17.9	17.6	17.5	16.7	14.9	16.0	17.4	16.1	17.2	19.1	20.9	17.2	15.0	16.5	16.0	15.4	15.3	17.2	18.2	18.9
Space Cooling	5.6	7.6	6.8	8.1	5.6	8.0	6.7	5.5	6.6	5.1	6.8	4.7	9.2	8.7	8.0	9.0	9.8	10.4	13.4	10.0
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (GJ/m^2)	**1.55**	**1.55**	**1.52**	**1.57**	**1.81**	**1.59**	**1.40**	**1.58**	**1.48**	**1.30**	**1.19**	**1.45**	**1.41**	**1.29**	**1.42**	**1.46**	**1.41**	**1.37**	**1.33**	**1.35**
Total GHG Emissions for Information and Cultural Industries Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**31.1**	**33.4**	**31.2**	**29.4**	**32.1**	**29.1**	**29.6**	**24.4**	**22.9**	**20.3**	**20.8**	**24.3**	**24.3**	**23.4**	**21.0**	**22.5**	**20.9**	**17.2**	**14.4**	**14.8**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 12: Offices[2] Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Offices[2] (PJ)	**18.5**	**18.9**	**18.6**	**21.5**	**19.6**	**19.3**	**17.1**	**19.0**	**18.6**	**17.1**	**18.8**	**19.7**	**17.6**	**16.1**	**17.6**	**18.1**	**17.5**	**17.0**	**16.5**	**16.7**
Energy Use by Energy Source (PJ)																				
Electricity	8.9	9.2	9.1	9.8	8.6	9.0	8.6	8.8	9.0	8.9	9.1	8.3	8.9	8.6	9.1	9.2	9.3	9.4	9.9	9.8
Natural Gas	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	1.5	1.8	2.2	3.0	3.4	3.6
Light Fuel Oil and Kerosene	4.8	5.0	5.1	5.3	5.1	4.4	3.9	4.9	5.4	5.2	6.4	6.6	5.0	5.8	5.9	6.1	5.2	4.3	3.0	3.1
Heavy Fuel Oil	4.2	4.0	3.8	5.6	5.5	5.5	4.2	4.8	3.6	2.6	2.8	4.2	3.2	1.1	0.8	0.7	0.5	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	0.6	0.7	0.7	0.6	0.4	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3
Shares (%)																				
Electricity	48.1	48.8	48.9	45.6	43.9	46.6	50.2	46.6	48.5	52.0	48.5	42.3	50.7	53.5	51.6	50.7	52.9	55.2	60.0	58.5
Natural Gas	0.0	0.0	0.0	1.1	0.1	0.1	0.1	0.1	0.4	0.6	0.6	1.1	1.2	2.1	8.6	9.8	12.6	17.7	20.6	21.7
Light Fuel Oil and Kerosene	26.2	26.3	27.2	24.5	25.8	22.6	22.9	25.8	29.2	30.5	34.2	33.7	28.6	35.7	33.7	33.7	29.6	25.4	17.9	18.2
Heavy Fuel Oil	22.6	21.3	20.2	25.9	28.3	28.7	24.3	25.4	19.4	14.9	15.0	21.4	18.1	7.0	4.4	4.0	2.9	0.0	0.0	0.0
Steam	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	3.1	3.6	3.6	2.9	1.9	2.0	2.5	2.2	2.6	2.0	1.7	1.4	1.4	1.8	1.7	1.8	1.9	1.7	1.5	1.6
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (GJ/m^2)	**1.21**	**1.21**	**1.18**	**1.33**	**1.19**	**1.15**	**1.00**	**1.10**	**1.06**	**0.96**	**1.04**	**1.08**	**0.95**	**0.86**	**0.95**	**0.97**	**0.94**	**0.90**	**0.87**	**0.89**
Total GHG Emissions for Offices[2] Excluding Electricity (Mt of CO_2e)	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.7**	**0.6**	**0.7**	**0.7**	**0.6**	**0.7**	**0.8**	**0.6**	**0.5**	**0.6**	**0.6**	**0.5**	**0.5**	**0.4**	**0.4**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
Light Fuel Oil and Kerosene	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2
Heavy Fuel Oil	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**37.4**	**36.7**	**36.6**	**39.1**	**40.6**	**38.7**	**36.0**	**38.6**	**36.9**	**34.1**	**36.7**	**41.2**	**35.1**	**32.2**	**31.9**	**32.3**	**30.1**	**27.3**	**23.3**	**24.1**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.
3) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 13: Offices2 Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Offices[2] (PJ)	**18.5**	**18.9**	**18.6**	**21.5**	**19.6**	**19.3**	**17.1**	**19.0**	**18.6**	**17.1**	**18.8**	**19.7**	**17.6**	**16.1**	**17.6**	**18.1**	**17.5**	**17.0**	**16.5**	**16.7**
Energy Use by End Use (PJ)																				
Space Heating	9.5	9.4	9.6	11.3	10.5	9.8	8.1	9.6	9.0	7.8	9.2	10.8	8.2	7.4	8.2	8.7	8.2	7.8	6.7	7.1
Water Heating	0.5	0.5	0.5	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Auxiliary Equipment	2.7	2.9	2.8	3.4	3.2	3.5	3.6	3.7	3.8	3.8	4.0	3.5	3.5	3.3	3.5	3.4	3.5	3.0	3.2	3.4
Auxiliary Motors	1.2	1.1	1.0	1.1	1.1	1.0	0.9	0.9	0.9	1.0	0.8	1.1	0.9	0.7	0.9	0.9	0.8	0.8	0.7	0.7
Lighting	3.6	3.6	3.5	3.5	3.3	3.2	3.1	3.3	3.3	3.4	3.4	2.9	3.0	3.0	3.2	3.2	3.1	3.4	3.5	3.6
Space Cooling	1.0	1.3	1.2	1.5	1.0	1.2	0.9	0.9	1.0	0.7	0.9	0.7	1.4	1.2	1.2	1.4	1.5	1.6	2.0	1.5
Shares (%)																				
Space Heating	51.4	50.1	51.3	52.8	53.5	50.6	47.3	50.5	48.5	45.6	48.6	55.0	46.4	45.7	46.6	48.1	46.7	46.2	40.5	42.5
Water Heating	3.0	2.8	2.7	3.0	2.8	2.8	2.9	2.9	2.9	2.8	3.1	3.4	3.6	2.9	3.1	2.9	2.5	2.3	2.6	2.5
Auxiliary Equipment	14.4	15.4	15.2	15.6	16.3	18.2	21.0	19.7	20.4	21.9	21.3	17.6	19.9	20.6	19.7	18.7	20.0	17.6	19.6	20.4
Auxiliary Motors	6.7	5.6	5.6	5.1	5.4	5.3	5.0	4.8	4.9	6.0	4.5	5.4	4.9	4.3	5.2	4.7	4.5	4.7	4.2	4.0
Lighting	19.2	19.0	18.8	16.5	17.0	16.6	18.3	17.5	18.0	19.6	18.0	14.9	17.1	18.8	18.3	17.7	17.5	19.9	21.1	21.7
Space Cooling	5.3	7.1	6.3	7.0	5.0	6.4	5.5	4.6	5.3	4.1	4.5	3.7	8.1	7.6	7.0	8.0	8.7	9.3	12.0	8.9
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (GJ/m^2)	**1.21**	**1.21**	**1.18**	**1.33**	**1.19**	**1.15**	**1.00**	**1.10**	**1.06**	**0.96**	**1.04**	**1.08**	**0.95**	**0.86**	**0.95**	**0.97**	**0.94**	**0.90**	**0.87**	**0.89**
Total GHG Emissions for Offices[2] Excluding Electricity (Mt of CO_2e)	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.7**	**0.6**	**0.7**	**0.7**	**0.6**	**0.7**	**0.8**	**0.6**	**0.5**	**0.6**	**0.6**	**0.5**	**0.5**	**0.4**	**0.4**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.6	0.6	0.6	0.8	0.7	0.7	0.6	0.7	0.6	0.5	0.6	0.8	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**37.4**	**36.7**	**36.6**	**39.1**	**40.6**	**38.7**	**36.0**	**38.6**	**36.9**	**34.1**	**36.7**	**41.2**	**35.1**	**32.2**	**31.9**	**32.3**	**30.1**	**27.3**	**23.3**	**24.1**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 14: Educational Services Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Educational Services (PJ)	**8.3**	**8.4**	**8.2**	**8.6**	**10.4**	**9.2**	**8.1**	**9.1**	**8.5**	**7.6**	**7.1**	**8.7**	**8.6**	**7.9**	**8.8**	**9.1**	**8.8**	**8.6**	**8.3**	**8.4**
Energy Use by Energy Source (PJ)																				
Electricity	4.4	4.2	4.4	4.5	4.9	4.5	3.9	5.2	5.0	4.9	4.5	5.0	5.0	4.5	5.5	5.4	6.2	5.3	5.6	5.5
Natural Gas	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.7	0.7	0.8	1.4	1.5	1.7	1.4	1.6	1.4	2.0	2.0	2.1
Light Fuel Oil and Kerosene	2.5	2.7	2.7	2.5	3.0	2.0	1.3	0.8	0.4	0.3	0.5	0.8	0.4	1.0	1.1	1.1	0.5	0.5	0.3	0.3
Heavy Fuel Oil	0.5	0.2	0.1	0.4	1.0	1.3	1.5	1.6	1.2	0.5	0.3	0.5	1.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	1.0	1.2	1.1	1.1	1.2	1.0	1.1	1.1	1.2	1.1	1.0	0.9	0.6	0.6	0.7	0.8	0.6	0.7	0.5	0.5
Shares (%)																				
Electricity	52.7	50.3	53.5	52.5	47.5	49.4	47.8	56.4	59.0	65.0	63.8	57.6	57.6	56.8	62.2	59.5	70.4	62.1	66.9	65.9
Natural Gas	0.0	0.0	0.0	1.6	2.3	4.5	4.8	4.9	8.3	9.4	10.9	16.6	16.9	22.1	16.2	17.2	15.6	23.8	24.1	24.7
Light Fuel Oil and Kerosene	29.7	32.7	32.5	28.7	29.1	21.3	15.8	8.5	4.2	4.4	6.5	9.6	4.3	12.2	12.1	11.9	6.0	5.8	3.5	3.4
Heavy Fuel Oil	5.9	3.0	0.9	4.3	10.0	14.1	18.0	17.9	14.5	6.6	4.8	6.2	13.7	0.9	1.6	2.1	0.9	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	11.7	14.0	13.1	12.8	11.2	10.7	13.5	12.4	14.1	14.6	14.0	10.0	7.5	8.0	8.0	9.3	7.0	8.2	5.5	6.0
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (GJ/m^2)	**1.22**	**1.23**	**1.20**	**1.23**	**1.49**	**1.31**	**1.16**	**1.31**	**1.22**	**1.07**	**0.97**	**1.19**	**1.17**	**1.06**	**1.17**	**1.20**	**1.16**	**1.12**	**1.09**	**1.11**
Total GHG Emissions for Educational Services Excluding Electricity (Mt of CO_2e)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.1**	**0.2**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Light Fuel Oil and Kerosene	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**32.6**	**34.0**	**31.8**	**32.3**	**36.0**	**34.4**	**35.3**	**29.4**	**26.5**	**21.7**	**22.1**	**25.7**	**26.2**	**24.9**	**22.4**	**23.9**	**16.8**	**20.7**	**17.5**	**18.1**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 15: Educational Services Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Educational Services (PJ)	**8.3**	**8.4**	**8.2**	**8.6**	**10.4**	**9.2**	**8.1**	**9.1**	**8.5**	**7.6**	**7.1**	**8.7**	**8.6**	**7.9**	**8.8**	**9.1**	**8.8**	**8.6**	**8.3**	**8.4**
Energy Use by End Use (PJ)																				
Space Heating	4.3	4.3	4.3	4.2	5.8	4.7	4.1	4.9	4.3	3.4	2.8	4.2	4.1	3.7	4.2	4.5	4.2	4.1	3.4	3.7
Water Heating	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.5	0.5
Auxiliary Equipment	1.0	1.0	1.0	1.2	1.3	1.3	1.2	1.3	1.3	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.5	1.4	1.5	1.6
Auxiliary Motors	0.6	0.5	0.5	0.5	0.6	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.4
Lighting	1.4	1.4	1.4	1.4	1.5	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5
Space Cooling	0.4	0.6	0.5	0.7	0.6	0.7	0.5	0.5	0.5	0.4	0.5	0.4	0.8	0.7	0.7	0.8	0.8	0.9	1.1	0.8
Shares (%)																				
Space Heating	52.1	51.3	52.6	49.2	56.1	51.1	50.1	53.8	50.0	45.1	39.5	48.2	48.0	47.3	48.1	49.4	48.2	47.3	41.4	43.7
Water Heating	6.9	6.5	6.3	7.6	6.9	6.8	6.9	6.8	6.9	6.8	7.7	7.9	8.3	6.9	6.6	6.5	5.9	5.4	6.0	5.8
Auxiliary Equipment	11.7	12.4	12.3	13.8	12.4	13.6	14.9	14.1	15.2	18.4	20.4	17.1	15.7	17.5	17.3	16.3	17.6	16.1	17.9	18.7
Auxiliary Motors	7.1	5.9	5.9	5.9	5.3	5.7	5.4	5.0	5.4	6.7	6.0	6.1	5.0	4.3	5.2	4.7	4.5	5.0	4.5	4.3
Lighting	16.9	16.7	16.5	15.8	14.0	15.1	16.4	15.2	16.2	18.1	19.9	16.3	14.2	15.6	15.2	14.5	14.5	16.3	17.3	17.9
Space Cooling	5.4	7.2	6.4	7.7	5.3	7.7	6.4	5.2	6.3	4.9	6.5	4.5	8.8	8.3	7.6	8.6	9.4	9.9	12.8	9.6
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (GJ/m^2)	**1.22**	**1.23**	**1.20**	**1.23**	**1.49**	**1.31**	**1.16**	**1.31**	**1.22**	**1.07**	**0.97**	**1.19**	**1.17**	**1.06**	**1.17**	**1.20**	**1.16**	**1.12**	**1.09**	**1.11**
Total GHG Emissions for Educational Services Excluding Electricity (Mt of CO_2e)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.1**	**0.2**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**32.6**	**34.0**	**31.8**	**32.3**	**36.0**	**34.4**	**35.3**	**29.4**	**26.5**	**21.7**	**22.1**	**25.7**	**26.2**	**24.9**	**22.4**	**23.9**	**16.8**	**20.7**	**17.5**	**18.1**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 16: Health Care and Social Assistance Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Health Care and Social Assistance (PJ)	**8.5**	**8.6**	**8.4**	**8.5**	**10.2**	**9.2**	**8.3**	**9.3**	**8.7**	**7.7**	**6.8**	**8.6**	**8.8**	**8.3**	**9.3**	**9.5**	**9.2**	**8.7**	**8.5**	**8.6**
Energy Use by Energy Source (PJ)																				
Electricity	4.4	4.4	4.7	4.4	4.7	4.4	3.9	4.7	4.6	4.7	4.3	4.9	4.8	4.2	4.8	4.7	4.9	4.9	5.0	5.0
Natural Gas	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8
Light Fuel Oil and Kerosene	2.3	2.3	2.3	2.5	3.1	2.4	2.1	2.3	1.9	1.3	0.9	1.6	1.6	2.9	3.2	3.3	3.0	2.6	2.1	2.2
Heavy Fuel Oil	1.0	1.0	0.6	0.7	1.5	1.4	1.4	1.3	1.1	0.6	0.7	1.1	1.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.8	0.8	0.8	0.8	0.7	0.6	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.5	0.6	0.6	0.6
Shares (%)																				
Electricity	51.7	51.6	55.6	52.1	46.5	48.3	47.2	50.8	53.6	61.3	63.9	56.4	54.0	50.6	51.2	50.1	53.5	55.7	58.8	57.8
Natural Gas	0.0	0.0	0.0	1.2	1.7	3.0	2.7	2.5	2.5	3.0	2.9	4.3	5.4	7.6	6.4	6.3	7.2	7.6	9.6	9.5
Light Fuel Oil and Kerosene	26.9	26.7	27.3	29.0	30.4	25.9	25.5	24.6	21.8	17.2	13.1	18.3	17.9	34.3	34.0	34.8	32.9	29.7	24.7	25.4
Heavy Fuel Oil	12.3	11.9	7.1	8.2	14.2	15.8	16.6	14.3	12.7	8.1	9.7	12.9	15.3	0.6	1.0	1.5	1.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	9.1	9.7	10.0	9.5	7.3	7.0	7.9	7.9	9.4	10.4	10.4	8.1	7.5	6.9	7.4	7.3	5.2	7.0	7.0	7.3
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (GJ/m^2)	**2.18**	**2.19**	**2.13**	**2.18**	**2.62**	**2.33**	**2.08**	**2.32**	**2.18**	**1.91**	**1.67**	**2.08**	**2.10**	**1.92**	**2.10**	**2.15**	**2.09**	**2.00**	**1.96**	**2.00**
Total GHG Emissions for Health Care and Social Assistance <u>Excluding</u> Electricity (Mt of CO_2e)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2
Heavy Fuel Oil	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**33.9**	**33.8**	**30.8**	**33.1**	**37.4**	**35.9**	**36.7**	**34.1**	**31.9**	**26.0**	**24.3**	**29.7**	**31.2**	**32.3**	**32.1**	**32.9**	**30.4**	**28.6**	**26.0**	**26.7**

1) Data on GHG emissions are presented <u>excluding</u> GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 17: Health Care and Social Assistance Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Health Care and Social Assistance (PJ)	**8.5**	**8.6**	**8.4**	**8.5**	**10.2**	**9.2**	**8.3**	**9.3**	**8.7**	**7.7**	**6.8**	**8.6**	**8.8**	**8.3**	**9.3**	**9.5**	**9.2**	**8.7**	**8.5**	**8.6**
Energy Use by End Use (PJ)																				
Space Heating	3.9	3.9	3.9	3.6	5.1	4.2	3.7	4.4	3.8	2.9	1.9	3.4	3.7	3.4	3.9	4.1	3.8	3.6	3.0	3.3
Water Heating	0.8	0.7	0.7	0.9	0.9	0.8	0.7	0.8	0.8	0.7	0.7	0.9	1.0	0.8	0.8	0.8	0.8	0.6	0.7	0.6
Auxiliary Equipment	1.4	1.5	1.4	1.7	1.8	1.7	1.7	1.8	1.8	1.9	2.0	2.1	1.9	1.9	2.2	2.1	2.1	1.9	2.0	2.1
Auxiliary Motors	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3
Lighting	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.2	1.3	1.4	1.3	1.3	1.4	1.4	1.5
Space Cooling	0.4	0.6	0.5	0.6	0.5	0.7	0.5	0.5	0.5	0.4	0.4	0.4	0.7	0.6	0.7	0.8	0.8	0.8	1.0	0.8
Shares (%)																				
Space Heating	46.7	45.7	46.8	42.1	50.1	45.6	44.4	47.8	44.1	38.1	28.8	39.7	41.8	41.1	41.9	43.2	41.8	41.6	35.9	37.8
Water Heating	9.2	8.7	8.5	10.3	9.3	9.1	9.0	9.0	9.0	9.0	10.5	10.6	11.2	9.3	8.9	8.8	8.5	7.1	7.8	7.4
Auxiliary Equipment	16.2	17.3	17.1	19.4	17.2	18.6	20.3	19.3	20.7	25.2	28.9	23.9	21.0	23.3	23.2	21.9	23.4	21.7	23.8	24.9
Auxiliary Motors	5.8	4.8	4.8	4.9	4.3	4.6	4.3	4.0	4.3	5.4	5.0	5.0	4.0	3.4	4.1	3.8	3.6	4.3	3.8	3.6
Lighting	16.9	16.6	16.5	15.9	14.0	14.9	16.0	15.0	15.9	17.8	20.4	16.4	13.8	15.2	14.8	14.3	14.1	16.1	16.8	17.4
Space Cooling	5.2	6.9	6.2	7.5	5.1	7.3	6.0	4.9	5.9	4.6	6.4	4.3	8.2	7.7	7.1	8.0	8.7	9.3	11.9	8.9
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (GJ/m^2)	**2.18**	**2.19**	**2.13**	**2.18**	**2.62**	**2.33**	**2.08**	**2.32**	**2.18**	**1.91**	**1.67**	**2.08**	**2.10**	**1.92**	**2.10**	**2.15**	**2.09**	**2.00**	**1.96**	**2.00**
Total GHG Emissions for Health Care and Social Assistance Excluding Electricity (Mt of CO_2e)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Water Heating	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**33.9**	**33.8**	**30.8**	**33.1**	**37.4**	**35.9**	**36.7**	**34.1**	**31.9**	**26.0**	**24.3**	**29.7**	**31.2**	**32.3**	**32.1**	**32.9**	**30.4**	**28.6**	**26.0**	**26.7**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 18: Arts, Entertainment and Recreation Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Arts, Entertainment and Recreation (PJ)	**1.0**	**1.0**	**1.0**	**1.0**	**1.2**	**1.1**	**1.0**	**1.1**	**1.0**	**0.9**	**0.9**	**1.1**	**1.1**	**1.0**	**1.1**	**1.2**	**1.1**	**1.1**	**1.1**	**1.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Light Fuel Oil and Kerosene	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Heavy Fuel Oil	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	53.2	50.4	53.8	52.5	47.8	49.4	48.2	57.3	59.7	65.8	64.1	58.5	57.6	57.2	62.8	59.8	60.6	66.8	70.9	70.6
Natural Gas	0.0	0.0	0.0	1.7	2.3	4.6	4.8	4.9	8.1	8.9	10.5	15.9	17.0	21.0	15.1	16.1	19.5	20.4	20.8	20.9
Light Fuel Oil and Kerosene	29.1	32.5	32.2	28.2	28.1	20.3	14.9	7.2	3.5	4.2	6.2	9.2	4.3	12.2	11.9	11.9	8.4	5.1	3.0	2.9
Heavy Fuel Oil	5.8	3.0	0.9	4.3	9.9	13.9	17.9	17.6	13.8	5.6	4.2	5.6	12.3	1.0	1.6	2.1	1.2	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	11.9	14.1	13.1	13.3	11.9	11.8	14.2	12.9	14.9	15.5	15.0	10.8	8.8	8.6	8.7	10.0	10.3	7.8	5.3	5.6
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (GJ/m^2)	**1.34**	**1.33**	**1.30**	**1.33**	**1.56**	**1.35**	**1.20**	**1.36**	**1.26**	**1.12**	**1.01**	**1.25**	**1.19**	**1.09**	**1.21**	**1.24**	**1.19**	**1.15**	**1.10**	**1.14**
Total GHG Emissions for Arts, Entertainment and Recreation Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**32.2**	**33.9**	**31.5**	**32.2**	**35.7**	**34.3**	**35.0**	**28.6**	**25.9**	**21.0**	**21.9**	**25.2**	**26.0**	**24.8**	**22.1**	**23.9**	**22.6**	**18.3**	**15.4**	**15.6**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 19: Arts, Entertainment and Recreation Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Arts, Entertainment and Recreation (PJ)	**1.0**	**1.0**	**1.0**	**1.0**	**1.2**	**1.1**	**1.0**	**1.1**	**1.0**	**0.9**	**0.9**	**1.1**	**1.1**	**1.0**	**1.1**	**1.2**	**1.1**	**1.1**	**1.1**	**1.1**
Energy Use by End Use (PJ)																				
Space Heating	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.6	0.5	0.4	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5
Water Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Auxiliary Equipment	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Auxiliary Motors	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Lighting	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Space Heating	54.3	53.9	55.0	52.0	58.4	53.8	52.4	55.9	52.3	46.9	41.6	50.1	51.1	50.0	50.6	52.2	51.1	50.2	44.8	46.4
Water Heating	5.7	5.4	5.3	6.4	5.8	5.8	5.7	5.6	5.8	5.7	6.5	6.6	7.1	5.8	5.6	5.5	5.0	4.6	5.2	4.9
Auxiliary Equipment	12.2	13.1	12.9	14.6	12.9	14.3	15.7	14.7	16.0	19.2	21.4	17.8	16.7	18.6	18.3	17.3	18.7	17.1	19.4	19.9
Auxiliary Motors	7.4	6.2	6.1	6.2	5.5	6.1	5.6	5.2	5.6	6.9	6.2	6.3	5.3	4.6	5.5	5.0	4.8	5.3	4.9	4.6
Lighting	17.6	17.5	17.2	16.6	14.6	15.9	17.2	15.8	17.0	18.8	20.8	16.9	15.1	16.5	16.0	15.4	15.3	17.3	18.7	19.0
Space Cooling	2.9	3.9	3.4	4.2	2.8	4.1	3.4	2.8	3.4	2.6	3.5	2.4	4.8	4.5	4.1	4.6	5.1	5.4	7.1	5.2
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (GJ/m^2)	**1.34**	**1.33**	**1.30**	**1.33**	**1.56**	**1.35**	**1.20**	**1.36**	**1.26**	**1.12**	**1.01**	**1.25**	**1.19**	**1.09**	**1.21**	**1.24**	**1.19**	**1.15**	**1.10**	**1.14**
Total GHG Emissions for Arts, Entertainment and Recreation Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**32.2**	**33.9**	**31.5**	**32.2**	**35.7**	**34.3**	**35.0**	**28.6**	**25.9**	**21.0**	**21.9**	**25.2**	**26.0**	**24.8**	**22.1**	**23.9**	**22.6**	**18.3**	**15.4**	**15.6**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 20: Accommodation and Food Services Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Accommodation and Food Services (PJ)	**3.8**	**3.8**	**3.8**	**3.9**	**4.8**	**4.4**	**4.0**	**4.6**	**4.3**	**3.8**	**3.3**	**4.1**	**4.3**	**3.9**	**4.3**	**4.5**	**4.4**	**4.4**	**4.3**	**4.4**
Energy Use by Energy Source (PJ)																				
Electricity	2.1	2.1	2.3	2.2	2.3	2.2	2.0	2.5	2.5	2.4	2.2	2.4	2.4	2.0	2.3	2.3	2.4	2.5	2.6	2.6
Natural Gas	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4
Light Fuel Oil and Kerosene	1.0	1.0	1.0	1.1	1.4	1.1	1.0	1.1	0.9	0.7	0.4	0.8	0.8	1.4	1.6	1.7	1.6	1.4	1.1	1.2
Heavy Fuel Oil	0.5	0.5	0.3	0.3	0.7	0.7	0.7	0.7	0.5	0.3	0.3	0.6	0.6	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Shares (%)																				
Electricity	54.8	54.9	59.6	55.7	48.5	50.1	48.7	53.6	56.9	63.2	67.7	57.3	57.1	51.6	52.7	51.5	53.9	57.4	60.6	59.4
Natural Gas	0.0	0.0	0.0	1.2	1.7	3.1	2.7	2.5	2.1	2.5	2.1	3.5	4.9	5.8	4.6	4.5	5.2	6.3	8.3	8.4
Light Fuel Oil and Kerosene	26.5	26.1	26.7	28.2	29.6	24.9	25.2	23.9	21.6	18.7	12.9	19.6	18.7	36.8	36.2	37.0	35.3	31.1	26.1	26.9
Heavy Fuel Oil	12.5	12.2	7.3	8.3	14.4	15.8	16.7	14.4	12.0	7.5	9.1	13.4	13.5	0.7	1.1	1.6	1.2	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	6.2	6.8	6.4	6.5	5.8	6.2	6.7	5.7	7.3	8.2	8.2	6.3	5.8	5.2	5.4	5.5	4.4	5.2	5.0	5.2
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (GJ/m^2)	**1.96**	**1.97**	**1.91**	**1.94**	**2.29**	**2.03**	**1.79**	**2.01**	**1.87**	**1.61**	**1.40**	**1.76**	**1.80**	**1.64**	**1.80**	**1.85**	**1.78**	**1.73**	**1.69**	**1.71**
Total GHG Emissions for Accommodation and Food Services Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**31.9**	**31.8**	**28.3**	**30.8**	**36.2**	**34.7**	**35.8**	**32.3**	**29.8**	**24.9**	**22.0**	**29.4**	**29.2**	**32.1**	**31.5**	**32.5**	**30.6**	**27.8**	**25.2**	**25.9**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 21: Accommodation and Food Services Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Accommodation and Food Services (PJ)	**3.8**	**3.8**	**3.8**	**3.9**	**4.8**	**4.4**	**4.0**	**4.6**	**4.3**	**3.8**	**3.3**	**4.1**	**4.3**	**3.9**	**4.3**	**4.5**	**4.4**	**4.4**	**4.3**	**4.4**
Energy Use by End Use (PJ)																				
Space Heating	1.9	1.9	1.9	1.8	2.6	2.2	2.0	2.4	2.1	1.6	1.1	1.8	2.0	1.8	2.0	2.1	2.0	2.0	1.7	1.8
Water Heating	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Auxiliary Equipment	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.8
Auxiliary Motors	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Lighting	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.8
Space Cooling	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5
Shares (%)																				
Space Heating	50.6	49.5	50.7	46.2	54.4	49.6	48.7	52.3	48.5	42.7	33.7	44.5	46.1	45.5	46.3	47.5	46.3	45.4	39.5	41.9
Water Heating	7.8	7.3	7.2	8.8	7.9	7.7	7.7	7.7	7.8	7.9	9.4	9.4	9.4	7.8	7.5	7.3	6.7	6.1	6.8	6.6
Auxiliary Equipment	11.5	12.3	12.2	13.8	12.2	13.3	14.6	13.8	14.9	18.5	21.3	17.5	15.5	17.3	17.2	16.2	17.4	15.9	17.5	18.5
Auxiliary Motors	7.0	5.8	5.8	5.9	5.2	5.6	5.3	4.9	5.3	6.7	6.2	6.2	4.8	4.2	5.1	4.6	4.5	4.9	4.4	4.2
Lighting	17.0	16.8	16.7	16.2	14.2	15.1	16.4	15.4	16.3	18.6	21.4	17.1	14.3	15.7	15.3	14.6	14.6	16.4	17.3	18.0
Space Cooling	6.1	8.3	7.4	9.0	6.1	8.7	7.2	5.9	7.2	5.7	7.9	5.3	10.0	9.4	8.6	9.7	10.6	11.3	14.5	10.8
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (GJ/m^2)	**1.96**	**1.97**	**1.91**	**1.94**	**2.29**	**2.03**	**1.79**	**2.01**	**1.87**	**1.61**	**1.40**	**1.76**	**1.80**	**1.64**	**1.80**	**1.85**	**1.78**	**1.73**	**1.69**	**1.71**
Total GHG Emissions for Accommodation and Food Services Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**31.9**	**31.8**	**28.3**	**30.8**	**36.2**	**34.7**	**35.8**	**32.3**	**29.8**	**24.9**	**22.0**	**29.4**	**29.2**	**32.1**	**31.5**	**32.5**	**30.6**	**27.8**	**25.2**	**25.9**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 22: Other Services Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Other Services (PJ)	**1.4**	**1.4**	**1.4**	**1.4**	**1.6**	**1.4**	**1.2**	**1.4**	**1.3**	**1.1**	**1.0**	**1.2**	**1.1**	**1.0**	**1.1**	**1.1**	**1.0**	**0.9**	**0.9**	**0.9**
Energy Use by Energy Source (PJ)																				
Electricity	0.7	0.7	0.7	0.7	0.8	0.7	0.6	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Light Fuel Oil and Kerosene	0.4	0.5	0.4	0.4	0.5	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Heavy Fuel Oil	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Shares (%)																				
Electricity	53.0	50.3	53.6	52.5	47.7	49.4	48.0	57.1	59.5	65.5	64.0	58.2	57.6	57.1	62.6	59.7	60.5	66.7	70.9	70.4
Natural Gas	0.0	0.0	0.0	1.7	2.4	4.6	4.9	5.0	8.3	9.3	10.9	16.4	16.9	21.8	15.9	17.0	20.2	21.0	21.2	21.5
Light Fuel Oil and Kerosene	29.7	32.9	32.6	28.8	29.0	21.3	15.6	8.0	4.0	4.4	6.4	9.4	4.3	12.2	12.0	11.9	8.4	5.1	3.0	2.9
Heavy Fuel Oil	6.0	3.0	0.9	4.4	10.1	14.3	18.3	17.9	14.5	6.5	4.7	6.1	13.6	1.0	1.6	2.1	1.2	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	11.3	13.7	12.8	12.6	10.9	10.5	13.2	12.0	13.7	14.4	13.9	9.9	7.6	8.0	8.0	9.3	9.7	7.2	4.8	5.1
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (GJ/m^2)	**1.05**	**1.04**	**1.02**	**1.05**	**1.23**	**1.07**	**0.94**	**1.07**	**0.99**	**0.88**	**0.79**	**0.98**	**0.94**	**0.86**	**0.95**	**0.98**	**0.94**	**0.91**	**0.87**	**0.90**
Total GHG Emissions for Other Services Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**32.5**	**34.0**	**31.7**	**32.3**	**35.9**	**34.5**	**35.2**	**28.9**	**26.1**	**21.3**	**22.0**	**25.4**	**26.2**	**24.8**	**22.2**	**23.8**	**22.5**	**18.2**	**15.4**	**15.6**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 23: Other Services Secondary Energy Use and GHG Emissions by End Use

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Energy Use for Other Services (PJ)	**1.4**	**1.4**	**1.4**	**1.4**	**1.6**	**1.4**	**1.2**	**1.4**	**1.3**	**1.1**	**1.0**	**1.2**	**1.1**	**1.0**	**1.1**	**1.1**	**1.0**	**0.9**	**0.9**	**0.9**
Energy Use by End Use (PJ)																				
Space Heating	0.8	0.7	0.7	0.7	1.0	0.7	0.6	0.8	0.7	0.5	0.4	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Water Heating	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Auxiliary Equipment	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Auxiliary Motors	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Lighting	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
Space Cooling	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Space Heating	54.2	53.6	54.8	51.7	58.2	53.5	52.3	55.8	52.2	46.9	41.6	50.1	50.6	49.7	50.4	51.8	50.7	49.8	44.2	46.1
Water Heating	6.1	5.7	5.6	6.7	6.1	6.1	6.1	6.0	6.1	6.0	6.8	6.9	7.4	6.1	5.9	5.8	5.2	4.8	5.5	5.2
Auxiliary Equipment	12.2	13.1	12.8	14.5	12.9	14.2	15.6	14.6	15.9	19.2	21.3	17.8	16.5	18.4	18.2	17.2	18.5	17.0	19.1	19.7
Auxiliary Motors	7.4	6.2	6.1	6.2	5.5	6.0	5.6	5.2	5.6	6.9	6.2	6.3	5.2	4.5	5.4	5.0	4.8	5.3	4.8	4.6
Lighting	16.4	16.3	16.1	15.4	13.6	14.7	16.0	14.7	15.8	17.5	19.4	15.7	13.9	15.3	14.8	14.2	14.2	16.0	17.2	17.6
Space Cooling	3.8	5.1	4.6	5.5	3.7	5.5	4.5	3.7	4.4	3.4	4.6	3.2	6.3	5.9	5.4	6.1	6.7	7.1	9.3	6.8
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (GJ/m^2)	**1.05**	**1.04**	**1.02**	**1.05**	**1.23**	**1.07**	**0.94**	**1.07**	**0.99**	**0.88**	**0.79**	**0.98**	**0.94**	**0.86**	**0.95**	**0.98**	**0.94**	**0.91**	**0.87**	**0.90**
Total GHG Emissions for Other Services Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by End Use (Mt of CO2e)																				
Space Heating	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auxiliary Motors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lighting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Space Cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**32.5**	**34.0**	**31.7**	**32.3**	**35.9**	**34.5**	**35.2**	**28.9**	**26.1**	**21.3**	**22.0**	**25.4**	**26.2**	**24.8**	**22.2**	**23.8**	**22.5**	**18.2**	**15.4**	**15.6**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 24: Space Heating Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating Energy Use (PJ)	**29.0**	**28.9**	**29.2**	**30.2**	**36.4**	**31.5**	**27.2**	**32.8**	**29.3**	**23.9**	**21.5**	**30.1**	**27.6**	**25.0**	**27.9**	**29.4**	**27.6**	**26.4**	**22.3**	**23.8**
Energy Use by Energy Source (PJ)																				
Electricity	5.7	4.6	6.6	4.7	5.5	3.8	2.7	7.3	6.7	6.5	3.9	6.0	6.2	4.5	6.6	6.3	6.7	7.3	6.6	7.2
Natural Gas	0.0	0.0	0.0	0.7	0.9	1.5	1.3	1.5	2.1	2.1	2.1	4.0	4.1	4.5	4.6	5.3	6.2	7.8	7.9	8.4
Light Fuel Oil and Kerosene	13.8	14.9	14.8	14.3	16.8	12.9	10.6	10.1	9.2	8.0	8.7	10.9	8.4	12.9	13.8	14.2	11.7	9.6	6.9	7.2
Heavy Fuel Oil	7.1	6.3	4.9	7.6	10.4	11.0	10.0	11.2	8.4	4.4	4.4	7.1	7.4	1.4	1.4	1.5	1.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	2.5	3.2	3.0	2.8	2.8	2.3	2.5	2.7	2.9	2.8	2.4	2.1	1.6	1.6	1.7	2.1	2.0	1.7	1.0	1.1
Shares (%)																				
Electricity	19.5	15.7	22.5	15.6	15.2	12.0	9.8	22.2	22.9	27.1	18.0	19.9	22.3	17.9	23.5	21.3	24.4	27.6	29.4	30.1
Natural Gas	0.0	0.0	0.0	2.4	2.4	4.8	4.9	4.7	7.2	8.9	10.0	13.3	14.9	18.1	16.4	18.0	22.4	29.5	35.3	35.3
Light Fuel Oil and Kerosene	47.5	51.4	50.5	47.4	46.2	40.9	39.1	30.7	31.5	33.6	40.3	36.1	30.3	51.9	49.2	48.4	42.5	36.5	31.0	30.1
Heavy Fuel Oil	24.3	21.7	16.7	25.1	28.6	35.0	36.9	34.2	28.6	18.6	20.6	23.6	26.9	5.8	4.9	5.2	3.5	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	8.6	11.1	10.4	9.4	7.6	7.4	9.3	8.3	9.8	11.7	11.2	7.0	5.6	6.3	6.0	7.1	7.2	6.4	4.3	4.6
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.69**	**0.68**	**0.68**	**0.69**	**0.82**	**0.70**	**0.59**	**0.71**	**0.63**	**0.50**	**0.45**	**0.62**	**0.57**	**0.51**	**0.57**	**0.60**	**0.56**	**0.53**	**0.45**	**0.49**
Total Space Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.7**	**1.7**	**1.6**	**1.8**	**2.2**	**2.0**	**1.7**	**1.8**	**1.6**	**1.2**	**1.2**	**1.6**	**1.4**	**1.3**	**1.4**	**1.5**	**1.3**	**1.2**	**0.9**	**1.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4
Light Fuel Oil and Kerosene	1.0	1.1	1.0	1.0	1.2	0.9	0.8	0.7	0.7	0.6	0.6	0.8	0.6	0.9	1.0	1.0	0.8	0.7	0.5	0.5
Heavy Fuel Oil	0.5	0.5	0.4	0.6	0.8	0.8	0.7	0.8	0.6	0.3	0.3	0.5	0.6	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
GHG Intensity (tonne/TJ)	**57.1**	**59.5**	**54.6**	**59.4**	**60.0**	**62.0**	**63.4**	**54.6**	**53.2**	**49.2**	**55.6**	**54.0**	**52.2**	**53.2**	**49.6**	**50.7**	**47.5**	**43.7**	**41.3**	**40.8**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 25: Space Heating Secondary Energy Use and GHG Emissions by Activity Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Heating Energy Use (PJ)	**29.0**	**28.9**	**29.2**	**30.2**	**36.4**	**31.5**	**27.2**	**32.8**	**29.3**	**23.9**	**21.5**	**30.1**	**27.6**	**25.0**	**27.9**	**29.4**	**27.6**	**26.4**	**22.3**	**23.8**
Energy Use by Activity Type (PJ)																				
Wholesale Trade	1.7	1.7	1.8	1.7	2.3	1.9	1.6	2.0	1.8	1.4	1.1	1.7	1.7	1.5	1.7	1.7	1.6	1.5	1.3	1.3
Retail Trade	4.2	4.3	4.4	4.4	5.9	5.5	4.9	6.0	5.3	4.3	3.4	5.1	5.1	4.6	5.0	5.3	5.0	4.7	4.0	4.2
Transportation and Warehousing	1.5	1.5	1.5	1.3	1.8	1.4	1.2	1.4	1.3	1.0	0.8	1.3	1.2	1.1	1.2	1.2	1.1	1.1	0.9	1.0
Information and Cultural Industries	0.6	0.6	0.6	0.6	0.8	0.6	0.5	0.7	0.6	0.5	0.4	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.5
Offices[2]	9.5	9.4	9.6	11.3	10.5	9.8	8.1	9.6	9.0	7.8	9.2	10.8	8.2	7.4	8.2	8.7	8.2	7.8	6.7	7.1
Educational Services	4.3	4.3	4.3	4.2	5.8	4.7	4.1	4.9	4.3	3.4	2.8	4.2	4.1	3.7	4.2	4.5	4.2	4.1	3.4	3.7
Health Care and Social Assistance	3.9	3.9	3.9	3.6	5.1	4.2	3.7	4.4	3.8	2.9	1.9	3.4	3.7	3.4	3.9	4.1	3.8	3.6	3.0	3.3
Arts, Entertainment and Recreation	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.6	0.5	0.4	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5
Accommodation and Food Services	1.9	1.9	1.9	1.8	2.6	2.2	2.0	2.4	2.1	1.6	1.1	1.8	2.0	1.8	2.0	2.1	2.0	2.0	1.7	1.8
Other Services	0.8	0.7	0.7	0.7	1.0	0.7	0.6	0.8	0.7	0.5	0.4	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Shares (%)																				
Wholesale Trade	6.0	6.0	6.0	5.7	6.3	5.9	6.0	6.1	6.1	5.9	5.3	5.7	6.0	6.0	5.9	5.7	5.7	5.6	5.6	5.6
Retail Trade	14.5	14.9	15.1	14.5	16.3	17.4	18.0	18.4	18.1	17.9	15.9	17.0	18.4	18.3	18.1	18.1	18.0	17.8	17.8	17.8
Transportation and Warehousing	5.3	5.2	5.0	4.4	4.8	4.5	4.4	4.2	4.3	4.3	3.9	4.2	4.5	4.4	4.4	4.1	4.1	4.1	4.1	4.1
Information and Cultural Industries	1.9	1.9	2.0	1.9	2.1	2.0	2.0	2.0	2.0	2.0	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Offices[2]	32.7	32.6	32.7	37.6	28.7	31.0	29.8	29.3	30.8	32.7	42.5	35.9	29.6	29.5	29.4	29.6	29.7	29.7	29.9	29.8
Educational Services	14.9	14.8	14.8	14.0	16.0	14.9	15.0	15.0	14.5	14.3	12.9	14.0	15.0	15.0	15.2	15.3	15.3	15.4	15.4	15.4
Health Care and Social Assistance	13.6	13.5	13.4	11.9	14.0	13.2	13.5	13.5	13.0	12.2	9.0	11.4	13.4	13.7	14.0	13.9	13.9	13.8	13.7	13.6
Arts, Entertainment and Recreation	1.8	1.8	1.8	1.7	1.9	1.8	1.8	1.9	1.8	1.9	1.7	1.8	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1
Accommodation and Food Services	6.6	6.6	6.6	6.0	7.2	6.9	7.2	7.3	7.1	6.7	5.1	6.1	7.1	7.1	7.2	7.3	7.4	7.6	7.7	7.7
Other Services	2.6	2.6	2.6	2.4	2.6	2.4	2.3	2.3	2.2	2.1	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.7
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.69**	**0.68**	**0.68**	**0.69**	**0.82**	**0.70**	**0.59**	**0.71**	**0.63**	**0.50**	**0.45**	**0.62**	**0.57**	**0.51**	**0.57**	**0.60**	**0.56**	**0.53**	**0.45**	**0.49**
Total Space Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**1.7**	**1.7**	**1.6**	**1.8**	**2.2**	**2.0**	**1.7**	**1.8**	**1.6**	**1.2**	**1.2**	**1.6**	**1.4**	**1.3**	**1.4**	**1.5**	**1.3**	**1.2**	**0.9**	**1.0**
GHG Emissions by Activity Type (Mt of CO_2e)																				
Wholesale Trade	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Retail Trade	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Transportation and Warehousing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information and Cultural Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offices[2]	0.6	0.6	0.6	0.8	0.7	0.7	0.6	0.7	0.6	0.5	0.6	0.8	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4
Educational Services	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Health Care and Social Assistance	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Arts, Entertainment and Recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation and Food Services	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Services	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**57.1**	**59.5**	**54.6**	**59.4**	**60.0**	**62.0**	**63.4**	**54.6**	**53.2**	**49.2**	**55.6**	**54.0**	**52.2**	**53.2**	**49.6**	**50.7**	**47.5**	**43.7**	**41.3**	**40.8**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 26: Water Heating Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Water Heating Energy Use (PJ)	**3.1**	**3.0**	**2.9**	**3.6**	**3.8**	**3.4**	**3.1**	**3.5**	**3.3**	**2.9**	**3.1**	**3.9**	**4.0**	**3.1**	**3.3**	**3.3**	**2.9**	**2.5**	**2.7**	**2.7**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Natural Gas	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.6	0.7	1.3	1.4	2.1	2.1	2.0	1.9	1.8	2.2	2.1
Light Fuel Oil and Kerosene	1.8	1.6	1.7	2.3	2.4	2.1	1.6	2.2	1.0	0.3	0.5	0.8	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.1
Heavy Fuel Oil	0.2	0.0	0.0	0.1	0.2	0.4	0.3	0.3	0.6	0.6	0.4	0.5	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	1.1	1.3	1.1	1.0	0.8	0.7	0.9	0.7	1.1	1.3	1.1	0.9	0.8	0.6	0.8	0.9	0.7	0.5	0.4	0.4
Shares (%)																				
Electricity	2.3	1.7	1.6	2.5	5.8	5.6	5.4	5.7	5.6	7.4	14.0	9.3	5.8	5.0	5.3	5.3	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	1.9	2.0	3.1	4.5	3.3	11.8	19.2	21.5	33.1	35.0	67.9	62.3	60.8	65.5	72.5	80.0	79.3
Light Fuel Oil and Kerosene	58.7	55.2	59.5	64.6	63.9	60.3	51.6	62.2	30.6	10.1	16.9	21.1	6.3	7.3	8.8	7.8	4.9	3.1	2.1	2.0
Heavy Fuel Oil	4.9	0.9	0.1	3.1	6.1	10.5	11.0	8.2	17.6	20.2	12.6	12.5	33.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	34.2	42.2	38.8	28.0	22.3	20.4	27.4	20.7	34.4	43.0	35.0	23.9	18.9	19.8	23.6	26.0	24.6	19.4	12.9	13.7
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.07**	**0.07**	**0.07**	**0.08**	**0.09**	**0.08**	**0.07**	**0.08**	**0.07**	**0.06**	**0.07**	**0.08**	**0.08**	**0.06**	**0.07**	**0.07**	**0.06**	**0.05**	**0.06**	**0.05**
Total Water Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Light Fuel Oil and Kerosene	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**66.2**	**65.7**	**66.0**	**66.1**	**64.5**	**64.6**	**63.8**	**64.4**	**61.7**	**58.1**	**53.4**	**55.4**	**58.6**	**50.6**	**51.1**	**51.0**	**50.5**	**49.5**	**48.3**	**48.4**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 27: Water Heating Secondary Energy Use and GHG Emissions by Activity Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Water Heating Energy Use (PJ)	**3.1**	**3.0**	**2.9**	**3.6**	**3.8**	**3.4**	**3.1**	**3.5**	**3.3**	**2.9**	**3.1**	**3.9**	**4.0**	**3.1**	**3.3**	**3.3**	**2.9**	**2.5**	**2.7**	**2.7**
Energy Use by Activity Type (PJ)																				
Wholesale Trade	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Retail Trade	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5
Transportation and Warehousing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Information and Cultural Industries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Offices[2]	0.5	0.5	0.5	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Educational Services	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.5	0.5
Health Care and Social Assistance	0.8	0.7	0.7	0.9	0.9	0.8	0.7	0.8	0.8	0.7	0.7	0.9	1.0	0.8	0.8	0.8	0.8	0.6	0.7	0.6
Arts, Entertainment and Recreation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Accommodation and Food Services	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Other Services	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Shares (%)																				
Wholesale Trade	5.9	5.9	5.8	5.8	6.0	5.8	5.8	5.8	5.9	5.8	5.6	5.7	5.7	5.7	5.5	5.4	5.3	5.4	5.4	5.5
Retail Trade	15.1	15.5	15.6	15.7	16.4	17.8	18.0	18.3	18.5	18.4	17.7	17.9	18.3	18.2	17.6	17.7	17.4	17.8	17.8	17.7
Transportation and Warehousing	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.2
Information and Cultural Industries	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2
Offices[2]	17.6	17.4	17.5	18.1	14.5	15.8	15.8	15.9	16.0	16.5	18.7	17.2	15.6	15.3	16.4	15.7	15.0	15.5	15.6	15.6
Educational Services	18.2	18.1	18.0	17.9	19.0	18.3	18.0	17.7	17.6	17.5	17.2	17.5	17.7	17.7	17.6	17.9	17.6	18.3	18.3	18.3
Health Care and Social Assistance	24.9	24.9	24.8	24.2	25.1	24.0	23.9	23.8	23.5	23.3	22.7	23.4	24.5	25.1	25.1	25.2	26.7	24.2	24.0	24.0
Arts, Entertainment and Recreation	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Accommodation and Food Services	9.4	9.4	9.5	9.5	10.0	9.7	10.0	10.1	10.1	10.1	9.8	9.9	9.9	9.9	9.8	10.1	10.1	10.6	10.7	10.8
Other Services	2.7	2.7	2.6	2.6	2.6	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.7
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.07**	**0.07**	**0.07**	**0.08**	**0.09**	**0.08**	**0.07**	**0.08**	**0.07**	**0.06**	**0.07**	**0.08**	**0.08**	**0.06**	**0.07**	**0.07**	**0.06**	**0.05**	**0.06**	**0.05**
Total Water Heating GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**
GHG Emissions by Activity Type (Mt of CO_2e)																				
Wholesale Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and Warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information and Cultural Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offices[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health Care and Social Assistance	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, Entertainment and Recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation and Food Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**66.2**	**65.7**	**66.0**	**66.1**	**64.5**	**64.6**	**63.8**	**64.4**	**61.7**	**58.1**	**53.4**	**55.4**	**58.6**	**50.6**	**51.1**	**51.0**	**50.5**	**49.5**	**48.3**	**48.4**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 28: Auxiliary Equipment Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Auxiliary Equipment Energy Use (PJ)	**7.1**	**7.8**	**7.6**	**8.9**	**9.2**	**9.3**	**9.3**	**9.9**	**10.0**	**10.5**	**10.8**	**10.5**	**9.9**	**9.9**	**10.7**	**10.4**	**10.8**	**9.4**	**10.1**	**10.7**
Energy Use by Energy Source (PJ)																				
Electricity	6.2	6.9	6.6	7.9	8.1	8.2	8.2	8.7	8.8	9.5	9.8	9.6	9.0	9.0	9.7	9.5	10.2	8.4	9.1	9.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.0	1.0	1.0	0.9	0.9	1.0	0.9	0.6	1.0	1.0	1.1
Shares (%)																				
Electricity	87.5	88.1	87.5	88.0	87.8	88.1	88.1	87.6	87.6	90.8	91.0	90.7	90.7	91.1	90.8	90.9	94.4	89.6	89.6	89.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	12.5	11.9	12.5	12.0	12.2	11.9	11.9	12.4	12.3	9.2	8.9	9.3	9.3	8.9	9.1	9.0	5.6	10.4	10.3	10.3
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.17**	**0.18**	**0.18**	**0.20**	**0.21**	**0.21**	**0.20**	**0.21**	**0.21**	**0.22**	**0.23**	**0.22**	**0.20**	**0.20**	**0.22**	**0.21**	**0.22**	**0.19**	**0.21**	**0.22**
Total Auxiliary Equipment GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
GHG Intensity (tonne/TJ)	**7.7**	**7.3**	**7.7**	**7.3**	**7.5**	**7.3**	**7.3**	**7.6**	**7.6**	**5.6**	**5.5**	**5.7**	**5.7**	**5.5**	**5.6**	**5.5**	**3.4**	**6.4**	**6.3**	**6.3**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic[1]

Table 29: Auxiliary Equipment Secondary Energy Use and GHG Emissions by Activity Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Auxiliary Equipment Energy Use (PJ)	**7.1**	**7.8**	**7.6**	**8.9**	**9.2**	**9.3**	**9.3**	**9.9**	**10.0**	**10.5**	**10.8**	**10.5**	**9.9**	**9.9**	**10.7**	**10.4**	**10.8**	**9.4**	**10.1**	**10.7**
Energy Use by Activity Type (PJ)																				
Wholesale Trade	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Retail Trade	0.9	1.0	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.4	1.4	1.5	1.4	1.5	1.3	1.4	1.5
Transportation and Warehousing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Information and Cultural Industries	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Offices[2]	2.7	2.9	2.8	3.4	3.2	3.5	3.6	3.7	3.8	3.8	4.0	3.5	3.5	3.3	3.5	3.4	3.5	3.0	3.2	3.4
Educational Services	1.0	1.0	1.0	1.2	1.3	1.3	1.2	1.3	1.3	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.5	1.4	1.5	1.6
Health Care and Social Assistance	1.4	1.5	1.4	1.7	1.8	1.7	1.7	1.8	1.8	1.9	2.0	2.1	1.9	1.9	2.2	2.1	2.1	1.9	2.0	2.1
Arts, Entertainment and Recreation	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Accommodation and Food Services	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.8
Other Services	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Shares (%)																				
Wholesale Trade	4.9	4.9	4.9	4.9	5.1	4.8	4.8	4.9	4.9	5.1	4.9	5.2	5.0	5.1	5.1	5.0	5.0	4.8	4.8	4.8
Retail Trade	12.3	12.5	12.6	12.7	13.3	12.7	12.7	13.1	13.2	13.6	13.3	14.1	13.7	14.0	13.9	13.9	13.8	13.9	13.9	13.9
Transportation and Warehousing	0.8	1.1	1.0	1.4	1.5	1.4	1.3	1.3	1.4	1.4	1.4	1.5	1.6	1.7	1.6	1.6	1.6	1.7	1.7	1.7
Information and Cultural Industries	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Offices[2]	37.3	37.3	37.4	37.5	34.8	37.7	38.6	37.8	37.9	35.9	37.1	32.7	35.3	33.4	32.4	32.5	32.6	31.7	31.8	31.8
Educational Services	13.5	13.4	13.3	13.2	14.0	13.4	13.0	13.0	12.9	13.3	13.3	14.2	13.6	13.9	14.3	14.3	14.3	14.6	14.7	14.6
Health Care and Social Assistance	19.2	19.0	18.9	18.5	19.1	18.2	17.9	18.1	17.9	18.4	18.1	19.6	18.6	19.5	20.1	19.9	19.9	20.1	20.0	19.9
Arts, Entertainment and Recreation	1.6	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.9	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.0
Accommodation and Food Services	6.1	6.0	6.1	6.0	6.4	6.2	6.3	6.4	6.4	6.6	6.5	6.9	6.7	6.8	6.9	7.0	7.1	7.4	7.5	7.6
Other Services	2.4	2.3	2.3	2.3	2.3	2.1	2.0	2.0	2.0	2.0	1.9	2.0	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.6
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.17**	**0.18**	**0.18**	**0.20**	**0.21**	**0.21**	**0.20**	**0.21**	**0.21**	**0.22**	**0.23**	**0.22**	**0.20**	**0.20**	**0.22**	**0.21**	**0.22**	**0.19**	**0.21**	**0.22**
Total Auxiliary Equipment GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**
GHG Emissions by Activity Type (Mt of CO_2e)																				
Wholesale Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and Warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information and Cultural Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offices[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health Care and Social Assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, Entertainment and Recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation and Food Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**7.7**	**7.3**	**7.7**	**7.3**	**7.5**	**7.3**	**7.3**	**7.6**	**7.6**	**5.6**	**5.5**	**5.7**	**5.7**	**5.5**	**5.6**	**5.5**	**3.4**	**6.4**	**6.3**	**6.3**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 30: Auxiliary Motors Secondary Energy Use and GHG Emissions by Activity Type[2]

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Auxiliary Motors Energy Use[2] (PJ)	**3.9**	**3.3**	**3.2**	**3.4**	**3.5**	**3.4**	**2.8**	**3.0**	**3.0**	**3.3**	**2.8**	**3.5**	**2.8**	**2.2**	**3.0**	**2.8**	**2.6**	**2.7**	**2.3**	**2.3**
Energy Use by Activity Type (PJ)																				
Wholesale Trade	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Retail Trade	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.3
Transportation and Warehousing	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Information and Cultural Industries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0
Offices[3]	1.2	1.1	1.0	1.1	1.1	1.0	0.9	0.9	0.9	1.0	0.8	1.1	0.9	0.7	0.9	0.9	0.8	0.8	0.7	0.7
Educational Services	0.6	0.5	0.5	0.5	0.6	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.4
Health Care and Social Assistance	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3
Arts, Entertainment and Recreation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Accommodation and Food Services	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Services	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Shares (%)																				
Wholesale Trade	6.1	6.1	6.1	6.1	6.3	6.3	6.2	6.3	6.3	6.3	6.2	6.2	6.2	6.1	6.0	6.0	6.0	5.8	5.8	5.8
Retail Trade	14.9	15.2	15.3	15.4	16.1	16.0	16.3	16.5	16.6	16.5	16.4	16.3	16.4	16.3	16.1	16.1	16.0	15.1	15.1	15.1
Transportation and Warehousing	5.4	5.3	5.3	5.2	5.3	5.3	5.2	5.2	5.3	5.2	5.5	5.4	5.4	5.3	5.2	5.2	5.2	5.3	5.3	5.4
Information and Cultural Industries	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1
Offices[3]	32.3	32.4	32.4	32.7	30.2	30.3	30.3	30.4	30.5	30.8	30.7	30.8	30.8	30.8	30.8	30.8	30.9	29.6	29.8	29.7
Educational Services	15.2	15.1	15.0	15.0	15.8	15.7	15.5	15.3	15.1	15.1	15.3	15.3	15.2	15.2	15.5	15.5	15.5	16.0	16.0	16.0
Health Care and Social Assistance	12.7	12.7	12.6	12.3	12.7	12.6	12.6	12.5	12.3	12.3	12.3	12.4	12.5	12.8	13.0	12.9	12.9	13.9	13.8	13.7
Arts, Entertainment and Recreation	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2
Accommodation and Food Services	6.8	6.8	6.8	6.8	7.2	7.3	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.4	7.5	7.6	8.0	8.1	8.2
Other Services	2.7	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.09**	**0.08**	**0.07**	**0.08**	**0.08**	**0.07**	**0.06**	**0.06**	**0.06**	**0.07**	**0.06**	**0.07**	**0.06**	**0.05**	**0.06**	**0.06**	**0.05**	**0.05**	**0.05**	**0.05**
Total Auxiliary Motors GHG Emissions Excluding Electricity[2] (Mt of CO_2e)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GHG Intensity (tonne/TJ)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) Auxilliary motors consumes only electricity
3) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 31: Lighting Secondary Energy Use and GHG Emissions by Activity Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Lighting Energy Use[2] (PJ)	**10.4**	**10.5**	**10.3**	**10.2**	**10.4**	**10.0**	**9.8**	**10.4**	**10.4**	**10.3**	**10.4**	**10.0**	**9.2**	**9.3**	**9.9**	**9.8**	**9.3**	**10.1**	**10.4**	**10.9**
Energy Use by Activity Type (PJ)																				
Wholesale Trade	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Retail Trade	1.7	1.8	1.8	1.8	1.9	1.8	1.8	1.9	2.0	1.9	1.9	1.9	1.7	1.7	1.8	1.8	1.7	1.7	1.7	1.8
Transportation and Warehousing	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Information and Cultural Industries	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Offices[3]	3.6	3.6	3.5	3.5	3.3	3.2	3.1	3.3	3.3	3.4	3.4	2.9	3.0	3.0	3.2	3.2	3.1	3.4	3.5	3.6
Educational Services	1.4	1.4	1.4	1.4	1.5	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5
Health Care and Social Assistance	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.2	1.3	1.4	1.3	1.3	1.4	1.4	1.5
Arts, Entertainment and Recreation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Accommodation and Food Services	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.8
Other Services	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
Shares (%)																				
Wholesale Trade	5.6	5.5	5.5	5.5	5.7	5.7	5.7	5.7	5.7	5.7	5.6	5.9	5.6	5.5	5.4	5.4	5.4	5.2	5.2	5.2
Retail Trade	16.8	17.2	17.3	17.4	18.2	18.2	18.4	18.7	18.8	18.7	18.6	19.4	18.5	18.4	18.2	18.1	18.0	16.8	16.8	16.8
Transportation and Warehousing	4.4	4.3	4.3	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.5	4.7	4.4	4.3	4.3	4.2	4.2	4.3	4.3	4.3
Information and Cultural Industries	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
Offices[3]	34.1	34.2	34.3	34.5	31.9	32.1	32.1	32.2	32.3	32.5	32.5	29.1	32.8	32.8	32.7	32.7	32.8	33.4	33.5	33.5
Educational Services	13.4	13.3	13.2	13.2	13.9	13.9	13.7	13.4	13.3	13.3	13.5	14.1	13.4	13.3	13.6	13.6	13.6	13.9	13.9	13.8
Health Care and Social Assistance	13.7	13.6	13.6	13.3	13.7	13.6	13.6	13.4	13.3	13.2	13.2	14.1	13.4	13.7	13.9	13.8	13.8	13.9	13.8	13.8
Arts, Entertainment and Recreation	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Accommodation and Food Services	6.2	6.2	6.2	6.2	6.5	6.6	6.8	6.8	6.8	6.8	6.7	7.1	6.7	6.7	6.7	6.8	6.9	7.2	7.2	7.3
Other Services	2.2	2.2	2.1	2.1	2.1	2.1	2.0	1.9	1.9	1.8	1.8	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.5	1.4
Activity																				
Total Floor Space (million m^2)	41.88	42.67	43.13	43.76	44.43	45.05	45.77	46.34	46.77	47.36	47.84	48.29	48.89	49.16	49.21	49.23	49.11	49.35	49.25	48.98
Energy Intensity (GJ/m^2)	**0.25**	**0.25**	**0.24**	**0.23**	**0.24**	**0.22**	**0.21**	**0.22**	**0.22**	**0.22**	**0.22**	**0.21**	**0.19**	**0.19**	**0.20**	**0.20**	**0.19**	**0.20**	**0.21**	**0.22**
Total Lighting GHG Emissions Excluding Electricity[2] (Mt of CO_2e)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GHG Intensity (tonne/TJ)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) Lighting consumes only electricity and does not include street lighting.
3) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic[1]

Table 32: Space Cooling Secondary Energy Use and GHG Emissions by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Cooling Energy Use (PJ)	**3.0**	**4.2**	**3.7**	**4.6**	**3.5**	**4.6**	**3.4**	**3.1**	**3.6**	**2.5**	**3.0**	**2.6**	**5.0**	**4.4**	**4.4**	**5.1**	**5.4**	**5.5**	**6.9**	**5.2**
Energy Use by Energy Source (PJ)																				
Electricity	3.0	4.2	3.7	4.6	3.5	4.6	3.4	3.1	3.6	2.5	3.0	2.6	5.0	4.4	4.4	5.1	5.4	5.5	6.9	5.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Total Floor Space (million m^2)	27.80	29.00	29.99	31.11	32.30	33.46	34.36	35.16	35.84	36.64	37.19	37.72	38.39	38.78	38.99	39.20	39.29	39.87	40.19	40.38
Energy Intensity (GJ/m^2)	**0.11**	**0.14**	**0.12**	**0.15**	**0.11**	**0.14**	**0.10**	**0.09**	**0.10**	**0.07**	**0.08**	**0.07**	**0.13**	**0.11**	**0.11**	**0.13**	**0.14**	**0.14**	**0.17**	**0.13**
Total Space Cooling GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Energy Source (Mt of CO_2e)																				
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.

Commercial/Institutional Sector

Atlantic[1]

Table 33: Space Cooling Secondary Energy Use and GHG Emissions by Activity Type

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Space Cooling Energy Use (PJ)	**3.0**	**4.2**	**3.7**	**4.6**	**3.5**	**4.6**	**3.4**	**3.1**	**3.6**	**2.5**	**3.0**	**2.6**	**5.0**	**4.4**	**4.4**	**5.1**	**5.4**	**5.5**	**6.9**	**5.2**
Energy Use by Activity Type (PJ)																				
Wholesale Trade	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
Retail Trade	0.5	0.7	0.6	0.8	0.7	0.9	0.6	0.6	0.7	0.5	0.6	0.5	1.0	0.8	0.8	1.0	1.0	1.0	1.3	1.0
Transportation and Warehousing	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Information and Cultural Industries	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Offices[2]	1.0	1.3	1.2	1.5	1.0	1.2	0.9	0.9	1.0	0.7	0.9	0.7	1.4	1.2	1.2	1.4	1.5	1.6	2.0	1.5
Educational Services	0.4	0.6	0.5	0.7	0.6	0.7	0.5	0.5	0.5	0.4	0.5	0.4	0.8	0.7	0.7	0.8	0.8	0.9	1.1	0.8
Health Care and Social Assistance	0.4	0.6	0.5	0.6	0.5	0.7	0.5	0.5	0.5	0.4	0.4	0.4	0.7	0.6	0.7	0.8	0.8	0.8	1.0	0.8
Arts, Entertainment and Recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Accommodation and Food Services	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5
Other Services	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Wholesale Trade	6.3	6.2	6.2	6.2	6.6	6.4	6.6	6.6	6.7	6.6	6.6	6.5	6.5	6.4	6.3	6.3	6.3	6.2	6.2	6.2
Retail Trade	16.7	17.1	17.2	17.3	18.7	20.5	18.8	19.1	19.3	19.2	19.0	19.1	19.3	19.2	18.9	18.8	18.7	18.6	18.5	18.5
Transportation and Warehousing	3.5	3.5	3.4	3.4	3.6	3.5	3.5	3.5	3.6	3.6	3.7	3.8	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.4
Information and Cultural Industries	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2
Offices[2]	32.1	32.2	32.2	32.5	27.6	26.8	27.6	27.7	27.8	28.1	28.0	28.1	28.3	28.3	28.2	28.2	28.3	28.3	28.5	28.4
Educational Services	14.6	14.5	14.5	14.4	15.7	15.3	15.4	15.1	15.0	15.0	15.2	15.1	15.0	15.0	15.3	15.3	15.3	15.4	15.4	15.3
Health Care and Social Assistance	14.3	14.2	14.2	13.9	14.8	14.4	14.6	14.5	14.3	14.3	14.3	14.3	14.4	14.7	15.0	14.9	14.8	14.8	14.6	14.6
Arts, Entertainment and Recreation	0.9	0.9	0.9	0.9	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1
Accommodation and Food Services	7.6	7.6	7.6	7.6	8.3	8.2	8.6	8.6	8.6	8.6	8.6	8.5	8.5	8.5	8.5	8.6	8.8	9.0	9.0	9.1
Other Services	1.8	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.2
Activity																				
Total Floor Space (million m^2)	27.80	29.00	29.99	31.11	32.30	33.46	34.36	35.16	35.84	36.64	37.19	37.72	38.39	38.78	38.99	39.20	39.29	39.87	40.19	40.38
Energy Intensity (GJ/m^2)	**0.11**	**0.14**	**0.12**	**0.15**	**0.11**	**0.14**	**0.10**	**0.09**	**0.10**	**0.07**	**0.08**	**0.07**	**0.13**	**0.11**	**0.11**	**0.13**	**0.14**	**0.14**	**0.17**	**0.13**
Total Space Cooling GHG Emissions Excluding Electricity (Mt of CO_2e)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GHG Emissions by Activity Type (Mt of CO_2e)																				
Wholesale Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and Warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information and Cultural Industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offices[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health Care and Social Assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, Entertainment and Recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation and Food Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) Data on GHG emissions are presented excluding GHG emissions related to electricity production.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.

Commercial/Institutional Sector

Atlantic

Table 34: Street Lighting Secondary Energy Use and GHG Emissions

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Street Lighting Energy Use[1] (PJ)	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7
Total Street Lighting GHG Emissions Including Electricity[1] (Mt of CO_2e)	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GHG Intensity (tonne/TJ)	71.8	80.3	69.6	70.8	78.5	70.5	68.3	76.8	70.8	77.9	64.3	61.6	53.7	50.3	50.9	52.2	50.7	54.0	50.5	48.8

1) Street lighting consumes only electricity and does not relate to floor space activity.

Commercial/Institutional Sector

Atlantic

Table 35: Wholesale Trade Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Wholesale Trade[1] (PJ)	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (MJ/m^2)	**207.42**	**205.12**	**198.33**	**195.53**	**201.36**	**189.92**	**182.21**	**190.95**	**189.69**	**186.05**	**186.04**	**186.20**	**159.03**	**159.74**	**170.36**	**167.95**	**161.13**	**167.12**	**172.11**	**181.26**
Auxiliary Motors Energy Use for Wholesale Trade[1] (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (MJ/m^2)	**84.74**	**70.99**	**68.57**	**71.21**	**74.27**	**70.44**	**58.33**	**61.17**	**60.93**	**66.64**	**54.28**	**67.56**	**54.03**	**42.81**	**56.71**	**53.21**	**49.29**	**50.09**	**43.54**	**42.67**
Auxiliary Equipment Energy Use for Wholesale Trade (PJ)	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Shares (%)																				
Electricity	92.3	92.0	92.3	92.1	91.2	90.9	90.5	91.3	91.2	92.4	92.1	92.3	92.4	92.1	92.4	92.3	96.0	90.1	90.1	90.1
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	7.7	8.0	7.7	7.9	8.8	9.1	9.5	8.7	8.8	7.6	7.9	7.7	7.6	7.9	7.6	7.7	4.0	9.9	9.9	9.9
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (MJ/m^2)	**125.52**	**134.22**	**129.39**	**151.39**	**157.66**	**151.27**	**146.79**	**156.07**	**157.41**	**167.72**	**168.47**	**173.52**	**155.53**	**158.28**	**172.20**	**166.98**	**173.02**	**146.02**	**157.15**	**167.48**
Water Heating Energy Use for Wholesale Trade (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Light Fuel Oil and Kerosene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	2.7	1.8	1.6	3.1	6.4	6.2	5.9	6.2	6.4	8.7	17.5	11.1	6.6	5.0	5.9	5.9	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	2.0	2.0	3.3	4.7	3.4	12.2	20.0	23.0	34.3	34.9	69.5	62.0	61.0	66.6	73.6	80.9	80.3
Light Fuel Oil and Kerosene	59.7	56.1	60.3	65.9	65.4	62.2	52.4	63.2	31.5	10.1	14.3	20.6	6.3	7.6	9.8	8.7	5.4	3.5	2.3	2.2
Heavy Fuel Oil	4.8	0.9	0.1	2.4	6.2	11.1	12.2	8.8	18.8	21.4	12.1	12.1	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.8	41.2	38.0	26.6	20.0	17.2	24.8	18.3	31.1	39.8	33.2	21.8	16.3	17.9	22.2	24.4	23.0	17.9	11.8	12.5
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (MJ/m^2)	**65.80**	**61.86**	**59.36**	**73.09**	**77.40**	**66.97**	**59.38**	**66.00**	**62.54**	**54.47**	**55.88**	**70.19**	**72.43**	**54.88**	**57.79**	**56.75**	**49.79**	**44.53**	**48.07**	**47.11**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 36: Wholesale Trade Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Wholesale Trade (PJ)	**0.2**	**0.3**	**0.2**	**0.3**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**
Energy Use by Energy Source (PJ)																				
Electricity	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	1.89	1.96	2.02	2.09	2.18	2.26	2.32	2.38	2.45	2.48	2.51	2.53	2.56	2.56	2.54	2.55	2.55	2.56	2.58	2.60
Energy Intensity (MJ/m^2)	**100.49**	**132.69**	**112.62**	**136.04**	**106.47**	**131.77**	**95.66**	**86.98**	**97.28**	**65.95**	**79.64**	**66.73**	**127.09**	**108.72**	**109.10**	**125.80**	**132.10**	**134.29**	**166.80**	**125.33**
Space Heating Energy Use for Wholesale Trade (PJ)	**1.7**	**1.7**	**1.8**	**1.7**	**2.3**	**1.9**	**1.6**	**2.0**	**1.8**	**1.4**	**1.1**	**1.7**	**1.7**	**1.5**	**1.7**	**1.7**	**1.6**	**1.5**	**1.3**	**1.3**
Energy Use by Energy Source (PJ)																				
Electricity	0.4	0.3	0.5	0.4	0.4	0.3	0.2	0.6	0.6	0.6	0.3	0.5	0.5	0.4	0.6	0.6	0.5	0.7	0.6	0.7
Natural Gas	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5
Light Fuel Oil and Kerosene	0.8	0.9	0.9	0.9	1.1	0.8	0.6	0.5	0.3	0.1	0.2	0.3	0.1	0.4	0.4	0.4	0.3	0.2	0.1	0.1
Heavy Fuel Oil	0.2	0.1	0.0	0.1	0.3	0.4	0.4	0.5	0.4	0.2	0.1	0.2	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Shares (%)																				
Electricity	25.4	20.1	28.0	20.7	19.3	14.9	11.2	29.1	31.7	40.6	30.1	31.0	31.7	27.4	38.5	34.6	34.0	44.3	48.4	49.0
Natural Gas	0.0	0.0	0.0	2.7	3.4	6.7	6.9	6.7	12.7	17.0	22.2	27.6	28.1	34.7	23.9	25.5	32.6	34.6	37.7	37.1
Light Fuel Oil and Kerosene	48.0	53.1	51.0	50.9	48.8	44.4	39.1	24.8	14.9	7.9	13.2	16.2	7.9	24.2	23.4	22.6	16.4	10.2	6.8	6.4
Heavy Fuel Oil	10.5	5.9	1.8	7.6	14.9	20.9	26.6	25.0	22.6	11.0	9.3	10.5	21.5	1.9	3.1	4.1	2.4	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.0	20.9	19.2	17.9	13.6	13.1	16.2	14.4	18.1	23.4	25.2	14.7	10.7	11.7	11.2	13.3	14.6	10.9	7.1	7.5
Activity																				
Floor Space (million m^2)	2.79	2.83	2.85	2.89	2.94	2.99	3.03	3.08	3.14	3.16	3.17	3.18	3.20	3.19	3.15	3.14	3.13	3.12	3.11	3.10
Energy Intensity (MJ/m^2)	**623.82**	**613.99**	**615.12**	**595.29**	**785.45**	**626.20**	**539.59**	**654.15**	**567.83**	**450.16**	**359.29**	**536.10**	**521.61**	**468.54**	**523.45**	**531.78**	**500.37**	**475.90**	**404.06**	**433.68**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 37: Retail Trade Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Retail Trade[1] (PJ)	**1.7**	**1.8**	**1.8**	**1.8**	**1.9**	**1.8**	**1.8**	**1.9**	**2.0**	**1.9**	**1.9**	**1.9**	**1.7**	**1.7**	**1.8**	**1.8**	**1.7**	**1.7**	**1.7**	**1.8**
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (MJ/m^2)	**285.80**	**282.64**	**273.29**	**269.42**	**277.46**	**261.70**	**251.07**	**263.11**	**261.38**	**256.37**	**256.35**	**256.57**	**219.13**	**220.11**	**234.74**	**231.43**	**222.02**	**225.43**	**232.17**	**244.50**
Auxiliary Motors Energy Use for Retail Trade[1] (PJ)	**0.6**	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.6**	**0.5**	**0.4**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (MJ/m^2)	**93.41**	**78.26**	**75.59**	**78.50**	**81.88**	**77.65**	**64.30**	**67.43**	**67.17**	**73.46**	**59.83**	**74.48**	**59.56**	**47.20**	**62.52**	**58.66**	**54.33**	**54.06**	**46.99**	**46.05**
Auxiliary Equipment Energy Use for Retail Trade (PJ)	**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1.2**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.4**	**1.4**	**1.5**	**1.4**	**1.5**	**1.3**	**1.4**	**1.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.8	0.9	0.9	1.0	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.3	1.3	1.4	1.3	1.4	1.2	1.3	1.4
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	92.3	92.0	92.3	92.1	91.2	90.9	90.5	91.3	91.2	93.5	93.2	93.4	93.5	93.2	93.4	93.4	96.6	91.5	91.5	91.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	7.7	8.0	7.7	7.9	8.8	9.1	9.5	8.7	8.8	6.5	6.8	6.6	6.5	6.8	6.6	6.6	3.4	8.5	8.5	8.5
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (MJ/m^2)	**142.98**	**152.89**	**147.39**	**170.60**	**177.67**	**170.46**	**165.40**	**175.86**	**177.36**	**188.97**	**189.81**	**195.51**	**176.05**	**179.17**	**194.92**	**189.01**	**195.85**	**173.99**	**187.24**	**199.55**
Water Heating Energy Use for Retail Trade (PJ)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.6**	**0.7**	**0.7**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4
Light Fuel Oil and Kerosene	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	2.7	1.8	1.6	3.1	6.4	6.2	5.9	6.2	6.4	8.7	17.5	11.1	6.6	5.0	5.9	5.9	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	2.0	2.0	3.3	4.7	3.4	12.2	20.0	23.0	34.3	34.9	69.5	62.0	61.0	66.6	73.6	80.9	80.3
Light Fuel Oil and Kerosene	59.7	56.1	60.3	65.9	65.4	62.2	52.4	63.2	31.5	10.1	14.3	20.6	6.3	7.6	9.8	8.7	5.4	3.5	2.3	2.2
Heavy Fuel Oil	4.8	0.9	0.1	2.4	6.2	11.1	12.2	8.8	18.8	21.4	12.1	12.1	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.8	41.2	38.0	26.6	20.0	17.2	24.8	18.3	31.1	39.8	33.2	21.8	16.3	17.9	22.2	24.4	23.0	17.9	11.8	12.5
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (MJ/m^2)	**77.06**	**72.46**	**69.52**	**85.61**	**90.65**	**88.38**	**78.37**	**87.10**	**82.54**	**71.89**	**73.75**	**92.64**	**95.59**	**72.42**	**76.27**	**76.68**	**67.29**	**60.18**	**64.96**	**63.66**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 38: Retail Trade Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Retail Trade (PJ)	**0.5**	**0.7**	**0.6**	**0.8**	**0.7**	**0.9**	**0.6**	**0.6**	**0.7**	**0.5**	**0.6**	**0.5**	**1.0**	**0.8**	**0.8**	**1.0**	**1.0**	**1.0**	**1.3**	**1.0**
Energy Use by Energy Source (PJ)																				
Electricity	0.5	0.7	0.6	0.8	0.7	0.9	0.6	0.6	0.7	0.5	0.6	0.5	1.0	0.8	0.8	1.0	1.0	1.0	1.3	1.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	4.58	4.88	5.08	5.30	5.60	5.79	6.03	6.26	6.41	6.53	6.58	6.64	6.81	6.84	6.80	6.81	6.79	6.83	6.86	6.88
Energy Intensity (MJ/m^2)	**110.77**	**146.28**	**124.16**	**149.96**	**117.38**	**163.66**	**105.45**	**95.88**	**107.23**	**72.70**	**87.80**	**74.87**	**142.58**	**121.98**	**122.40**	**141.13**	**148.20**	**150.67**	**187.14**	**140.61**
Space Heating Energy Use for Retail Trade (PJ)	**4.2**	**4.3**	**4.4**	**4.4**	**5.9**	**5.5**	**4.9**	**6.0**	**5.3**	**4.3**	**3.4**	**5.1**	**5.1**	**4.6**	**5.0**	**5.3**	**5.0**	**4.7**	**4.0**	**4.2**
Energy Use by Energy Source (PJ)																				
Electricity	1.1	0.9	1.2	0.9	1.1	0.8	0.5	1.8	1.7	1.7	1.0	1.6	1.6	1.3	1.9	1.8	1.7	2.1	1.9	2.1
Natural Gas	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.4	0.7	0.7	0.8	1.4	1.4	1.6	1.2	1.4	1.6	1.6	1.5	1.6
Light Fuel Oil and Kerosene	2.0	2.3	2.2	2.2	2.9	2.4	1.9	1.5	0.8	0.3	0.5	0.8	0.4	1.1	1.2	1.2	0.8	0.5	0.3	0.3
Heavy Fuel Oil	0.4	0.3	0.1	0.3	0.9	1.1	1.3	1.5	1.2	0.5	0.3	0.5	1.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.7	0.9	0.8	0.8	0.8	0.7	0.8	0.9	1.0	1.0	0.9	0.8	0.5	0.5	0.6	0.7	0.7	0.5	0.3	0.3
Shares (%)																				
Electricity	25.4	20.1	28.0	20.7	19.3	14.9	11.2	29.1	31.7	40.6	30.1	31.0	31.7	27.4	38.5	34.4	33.8	44.1	48.2	48.8
Natural Gas	0.0	0.0	0.0	2.7	3.4	6.7	6.9	6.7	12.7	17.0	22.2	27.6	28.1	34.7	23.9	25.5	32.6	34.7	37.9	37.3
Light Fuel Oil and Kerosene	48.0	53.1	51.0	50.9	48.8	44.4	39.1	24.8	14.9	7.9	13.2	16.2	7.9	24.2	23.4	22.7	16.5	10.2	6.8	6.4
Heavy Fuel Oil	10.5	5.9	1.8	7.6	14.9	20.9	26.6	25.0	22.6	11.0	9.3	10.5	21.5	1.9	3.1	4.1	2.4	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.0	20.9	19.2	17.9	13.6	13.1	16.2	14.4	18.1	23.4	25.2	14.7	10.7	11.7	11.2	13.3	14.6	10.9	7.2	7.5
Activity																				
Floor Space (million m^2)	6.12	6.38	6.49	6.63	6.85	6.94	7.15	7.36	7.46	7.53	7.55	7.58	7.74	7.74	7.65	7.63	7.57	7.54	7.49	7.45
Energy Intensity (MJ/m^2)	**687.67**	**676.83**	**678.08**	**658.21**	**867.68**	**788.46**	**683.33**	**818.64**	**712.21**	**566.77**	**452.78**	**675.59**	**657.33**	**590.45**	**659.66**	**696.80**	**655.64**	**623.58**	**529.44**	**568.25**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 39: Transportation and Warehousing Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Transportation and Warehousing[1] (PJ)	**0.5**	**0.5**	**0.4**	**0.4**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (MJ/m^2)	**194.83**	**192.67**	**186.30**	**183.66**	**189.14**	**178.40**	**171.15**	**179.36**	**178.18**	**174.76**	**183.60**	**183.76**	**156.94**	**157.65**	**168.12**	**165.75**	**159.01**	**173.61**	**178.80**	**188.29**
Auxiliary Motors Energy Use for Transportation and Warehousing[1] (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (MJ/m^2)	**88.30**	**73.98**	**71.45**	**74.20**	**77.40**	**73.40**	**60.79**	**63.74**	**63.49**	**69.44**	**59.42**	**73.97**	**59.16**	**46.87**	**62.09**	**58.26**	**53.96**	**57.73**	**50.18**	**49.18**
Auxiliary Equipment Energy Use for Transportation and Warehousing (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (MJ/m^2)	**23.30**	**34.81**	**33.47**	**54.62**	**56.47**	**53.78**	**50.92**	**53.75**	**53.82**	**56.95**	**59.67**	**61.47**	**63.59**	**64.71**	**70.40**	**68.27**	**70.74**	**62.84**	**67.63**	**72.08**
Water Heating Energy Use for Transportation and Warehousing (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	2.7	1.8	1.6	3.1	6.4	6.2	5.9	6.2	6.4	8.7	17.5	11.1	6.6	5.0	5.9	5.9	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	2.0	2.0	3.3	4.7	3.4	12.2	20.0	23.0	34.3	34.9	69.5	62.0	61.0	66.6	73.6	80.9	80.3
Light Fuel Oil and Kerosene	59.7	56.1	60.3	65.9	65.4	62.2	52.4	63.2	31.5	10.1	14.3	20.6	6.3	7.6	9.8	8.7	5.4	3.5	2.3	2.2
Heavy Fuel Oil	4.8	0.9	0.1	2.4	6.2	11.1	12.2	8.8	18.8	21.4	12.1	12.1	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.8	41.2	38.0	26.6	20.0	17.2	24.8	18.3	31.1	39.8	33.2	21.8	16.3	17.9	22.2	24.4	23.0	17.9	11.8	12.5
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (MJ/m^2)	**30.94**	**29.10**	**27.92**	**34.38**	**36.40**	**31.49**	**27.93**	**31.04**	**29.41**	**25.62**	**27.59**	**34.65**	**35.76**	**27.09**	**28.53**	**28.69**	**25.17**	**22.51**	**24.30**	**23.81**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 40: Transportation and Warehousing Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Transportation and Warehousing (PJ)	**0.1**	**0.1**	**0.1**	**0.2**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	1.54	1.58	1.61	1.66	1.71	1.77	1.80	1.84	1.90	1.92	1.94	1.95	1.96	1.96	1.95	1.95	1.96	1.97	1.98	2.00
Energy Intensity (MJ/m^2)	**69.78**	**92.47**	**78.40**	**94.85**	**73.95**	**91.89**	**66.44**	**60.40**	**67.57**	**45.80**	**58.07**	**50.45**	**90.07**	**77.05**	**77.32**	**89.16**	**93.62**	**95.18**	**118.22**	**88.82**
Space Heating Energy Use for Transportation and Warehousing (PJ)	**1.5**	**1.5**	**1.5**	**1.3**	**1.8**	**1.4**	**1.2**	**1.4**	**1.3**	**1.0**	**0.8**	**1.3**	**1.2**	**1.1**	**1.2**	**1.2**	**1.1**	**1.1**	**0.9**	**1.0**
Energy Use by Energy Source (PJ)																				
Electricity	0.4	0.3	0.4	0.3	0.3	0.2	0.1	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.5	0.4	0.4	0.5	0.4	0.5
Natural Gas	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.4
Light Fuel Oil and Kerosene	0.7	0.8	0.8	0.7	0.9	0.6	0.5	0.3	0.2	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.2	0.1	0.1	0.1
Heavy Fuel Oil	0.2	0.1	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1
Shares (%)																				
Electricity	25.4	20.1	28.0	20.7	19.3	14.9	11.2	29.1	31.7	40.6	30.1	31.0	31.7	27.4	38.5	34.4	33.8	44.1	48.2	48.8
Natural Gas	0.0	0.0	0.0	2.7	3.4	6.7	6.9	6.7	12.7	17.0	22.2	27.6	28.1	34.7	23.9	25.5	32.6	34.7	37.9	37.3
Light Fuel Oil and Kerosene	48.0	53.1	51.0	50.9	48.8	44.4	39.1	24.8	14.9	7.9	13.2	16.2	7.9	24.2	23.4	22.7	16.5	10.2	6.8	6.4
Heavy Fuel Oil	10.5	5.9	1.8	7.6	14.9	20.9	26.6	25.0	22.6	11.0	9.3	10.5	21.5	1.9	3.1	4.1	2.4	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.0	20.9	19.2	17.9	13.6	13.1	16.2	14.4	18.1	23.4	25.2	14.7	10.7	11.7	11.2	13.3	14.6	10.9	7.2	7.5
Activity																				
Floor Space (million m^2)	2.36	2.36	2.36	2.37	2.40	2.43	2.44	2.46	2.52	2.53	2.54	2.55	2.55	2.53	2.51	2.50	2.49	2.48	2.47	2.48
Energy Intensity (MJ/m^2)	**648.82**	**635.25**	**623.83**	**564.72**	**731.30**	**577.24**	**491.07**	**561.73**	**499.19**	**403.83**	**334.82**	**499.59**	**486.09**	**436.63**	**487.81**	**486.59**	**457.85**	**435.46**	**369.72**	**396.82**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 41: Information and Cultural Industries Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Information and Cultural Industries[1] (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (MJ/m^2)	**277.21**	**274.14**	**265.07**	**261.32**	**269.11**	**253.83**	**243.52**	**255.20**	**253.52**	**248.66**	**248.64**	**248.85**	**212.54**	**213.49**	**227.68**	**224.47**	**215.34**	**235.10**	**242.13**	**254.99**
Auxiliary Motors Energy Use for Information and Cultural Industries[1] (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (MJ/m^2)	**108.32**	**90.76**	**87.65**	**91.03**	**94.95**	**90.04**	**74.57**	**78.19**	**77.89**	**85.19**	**69.39**	**86.37**	**69.07**	**54.73**	**72.50**	**68.02**	**63.01**	**67.41**	**58.59**	**57.42**
Auxiliary Equipment Energy Use for Information and Cultural Industries (PJ)	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	94.3	94.1	94.3	93.7	92.7	92.4	92.1	92.8	92.7	94.5	94.3	94.5	94.5	94.3	94.5	94.5	97.2	92.8	92.8	92.8
Natural Gas	0.0	0.0	0.0	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.3	0.9	1.0	1.1
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	5.7	5.9	5.7	5.9	6.9	7.1	7.4	6.8	6.8	4.9	5.1	5.0	4.9	4.9	4.8	4.8	2.5	6.4	6.2	6.2
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (MJ/m^2)	**184.81**	**197.61**	**190.50**	**220.52**	**229.65**	**220.33**	**213.79**	**227.30**	**229.24**	**244.26**	**245.34**	**252.71**	**226.63**	**230.64**	**250.91**	**243.31**	**252.11**	**223.97**	**241.03**	**256.88**
Water Heating Energy Use for Information and Cultural Industries (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	1.5	1.5	1.5	1.3	5.0	5.0	5.9	5.8	5.0	6.2	13.0	7.8	5.0	5.0	5.7	5.7	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	1.5	1.4	2.1	3.3	2.7	9.5	15.9	18.2	30.1	43.3	56.8	48.5	46.9	52.2	60.7	70.9	69.9
Light Fuel Oil and Kerosene	57.4	52.3	56.2	61.7	59.4	55.9	49.2	57.6	29.6	9.7	13.8	21.8	9.3	7.4	9.2	8.0	5.1	3.4	2.4	2.3
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	41.1	46.2	42.3	35.4	34.2	37.1	41.6	34.0	55.9	68.2	55.1	40.3	42.4	30.8	36.6	39.4	37.8	30.9	21.6	22.8
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (MJ/m^2)	**94.84**	**88.97**	**85.37**	**105.68**	**111.31**	**96.32**	**85.41**	**94.92**	**89.95**	**78.56**	**81.33**	**101.73**	**104.45**	**78.92**	**83.38**	**83.68**	**73.33**	**65.58**	**70.79**	**69.37**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 42: Information and Cultural Industries Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Information and Cultural Industries (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.61	0.62	0.64	0.65	0.66	0.66	0.67	0.67	0.67	0.68	0.69	0.71	0.71
Energy Intensity (MJ/m^2)	**128.46**	**169.62**	**143.98**	**173.92**	**136.12**	**168.45**	**122.30**	**111.18**	**124.37**	**84.31**	**101.82**	**85.35**	**162.55**	**139.06**	**139.54**	**160.90**	**168.96**	**171.76**	**213.35**	**160.30**
Space Heating Energy Use for Information and Cultural Industries (PJ)	**0.6**	**0.6**	**0.6**	**0.6**	**0.8**	**0.6**	**0.5**	**0.7**	**0.6**	**0.5**	**0.4**	**0.6**	**0.6**	**0.5**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
Light Fuel Oil and Kerosene	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Heavy Fuel Oil	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Shares (%)																				
Electricity	25.4	15.9	23.8	26.4	27.7	28.2	25.0	44.0	41.7	40.6	30.3	31.3	32.1	27.9	39.1	35.0	34.4	44.8	48.9	49.5
Natural Gas	0.0	0.0	0.0	2.8	3.5	7.1	7.6	7.2	13.0	17.1	22.2	27.6	28.1	34.9	24.0	25.6	32.6	34.5	37.5	37.0
Light Fuel Oil and Kerosene	48.0	57.6	55.5	44.7	39.5	28.6	20.6	6.5	3.5	8.0	13.0	15.9	7.6	23.5	22.6	21.9	15.9	9.8	6.5	6.1
Heavy Fuel Oil	10.5	5.8	1.8	7.8	15.3	22.3	29.1	26.8	23.2	11.0	9.3	10.5	21.5	1.9	3.1	4.1	2.4	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.0	20.6	19.0	18.3	14.0	13.9	17.7	15.4	18.6	23.4	25.2	14.7	10.7	11.8	11.2	13.3	14.6	10.9	7.1	7.5
Activity																				
Floor Space (million m^2)	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.79	0.79	0.81	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.85	0.84
Energy Intensity (MJ/m^2)	**797.51**	**785.01**	**786.41**	**762.45**	**1,005.57**	**801.84**	**691.99**	**838.91**	**727.96**	**577.30**	**461.75**	**688.16**	**669.24**	**601.15**	**671.61**	**709.42**	**667.52**	**634.88**	**539.03**	**578.55**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 43: Offices1 Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use[2] for Offices[1] (PJ)	**3.6**	**3.6**	**3.5**	**3.5**	**3.3**	**3.2**	**3.1**	**3.3**	**3.3**	**3.4**	**3.4**	**2.9**	**3.0**	**3.0**	**3.2**	**3.2**	**3.1**	**3.4**	**3.5**	**3.6**
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (MJ/m^2)	**232.37**	**229.80**	**222.20**	**219.05**	**203.03**	**191.49**	**183.72**	**192.53**	**191.26**	**187.59**	**187.58**	**159.99**	**161.95**	**162.67**	**173.49**	**171.04**	**164.08**	**179.14**	**184.50**	**194.30**
Auxiliary Motors Energy Use[2] for Offices[1] (PJ)	**1.2**	**1.1**	**1.0**	**1.1**	**1.1**	**1.0**	**0.9**	**0.9**	**0.9**	**1.0**	**0.8**	**1.1**	**0.9**	**0.7**	**0.9**	**0.9**	**0.8**	**0.8**	**0.7**	**0.7**
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (MJ/m^2)	**81.36**	**68.17**	**65.84**	**68.37**	**64.19**	**60.87**	**50.41**	**52.86**	**52.65**	**57.59**	**46.90**	**58.39**	**46.69**	**37.00**	**49.01**	**45.98**	**42.59**	**42.38**	**36.84**	**36.10**
Auxiliary Equipment Energy Use for Offices[1] (PJ)	**2.7**	**2.9**	**2.8**	**3.4**	**3.2**	**3.5**	**3.6**	**3.7**	**3.8**	**3.8**	**4.0**	**3.5**	**3.5**	**3.3**	**3.5**	**3.4**	**3.5**	**3.0**	**3.2**	**3.4**
Energy Use by Energy Source (PJ)																				
Electricity	2.5	2.7	2.6	3.1	2.9	3.2	3.3	3.4	3.5	3.6	3.9	3.3	3.4	3.2	3.3	3.3	3.4	2.9	3.1	3.3
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	92.7	92.7	92.7	92.7	91.7	91.7	91.7	91.7	91.7	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	7.3	7.3	7.3	7.3	8.3	8.3	8.3	8.3	8.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (MJ/m^2)	**174.15**	**186.20**	**179.50**	**207.78**	**194.75**	**210.14**	**211.28**	**215.96**	**217.41**	**210.32**	**222.15**	**189.11**	**189.36**	**178.05**	**186.54**	**181.42**	**187.98**	**158.65**	**170.74**	**181.96**
Water Heating Energy Use for Offices[1] (PJ)	**0.5**	**0.5**	**0.5**	**0.7**	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.5**	**0.6**	**0.7**	**0.6**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.4	0.3
Light Fuel Oil and Kerosene	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Shares (%)																				
Electricity	0.7	1.2	1.4	0.6	3.1	3.4	3.0	3.2	2.5	2.5	2.2	2.3	2.5	5.0	2.3	2.4	4.9	4.9	4.9	4.9
Natural Gas	0.0	0.0	0.0	1.9	2.0	3.3	4.7	3.4	12.2	19.5	19.2	31.6	34.3	70.0	74.7	72.2	72.3	78.1	84.1	83.6
Light Fuel Oil and Kerosene	59.0	56.1	60.3	64.2	65.4	62.2	55.4	65.3	31.5	12.2	30.0	25.1	6.2	7.0	4.8	4.5	2.8	1.8	1.2	1.1
Heavy Fuel Oil	7.8	1.4	0.3	7.3	9.5	13.9	12.2	9.7	22.6	27.0	21.0	20.8	41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[3]	32.5	41.2	38.0	25.9	20.0	17.2	24.8	18.3	31.1	38.9	27.7	20.1	16.0	18.0	18.1	20.9	20.0	15.2	9.8	10.4
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (MJ/m^2)	**35.96**	**33.41**	**32.06**	**40.56**	**33.39**	**32.55**	**28.87**	**32.08**	**30.40**	**27.11**	**32.54**	**37.00**	**33.98**	**25.34**	**29.14**	**27.81**	**23.55**	**21.06**	**22.73**	**22.28**

1) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.
2) Lighting and auxiliary motors consume only electricity.
3) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 44: Offices1 Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Offices[1] (PJ)	**1.0**	**1.3**	**1.2**	**1.5**	**1.0**	**1.2**	**0.9**	**0.9**	**1.0**	**0.7**	**0.9**	**0.7**	**1.4**	**1.2**	**1.2**	**1.4**	**1.5**	**1.6**	**2.0**	**1.5**
Energy Use by Energy Source (PJ)																				
Electricity	1.0	1.3	1.2	1.5	1.0	1.2	0.9	0.9	1.0	0.7	0.9	0.7	1.4	1.2	1.2	1.4	1.5	1.6	2.0	1.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	10.11	10.57	10.94	11.44	11.89	12.37	12.71	13.04	13.32	13.72	13.94	14.16	14.44	14.60	14.65	14.76	14.82	15.09	15.26	15.32
Energy Intensity (MJ/m^2)	**96.49**	**127.41**	**108.14**	**130.63**	**81.67**	**100.21**	**73.37**	**66.71**	**74.61**	**50.58**	**61.08**	**51.72**	**98.50**	**84.26**	**84.55**	**97.50**	**102.38**	**104.08**	**129.28**	**97.13**
Space Heating Energy Use for Offices[1] (PJ)	**9.5**	**9.4**	**9.6**	**11.3**	**10.5**	**9.8**	**8.1**	**9.6**	**9.0**	**7.8**	**9.2**	**10.8**	**8.2**	**7.4**	**8.2**	**8.7**	**8.2**	**7.8**	**6.7**	**7.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.6	0.5	0.8	0.5	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.4	0.4	0.4	0.5	0.7	0.6	0.7
Natural Gas	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.4	1.9	2.7	3.0	3.3
Light Fuel Oil and Kerosene	4.5	4.7	4.8	4.9	4.7	4.0	3.6	4.5	5.3	5.2	6.3	6.5	5.0	5.7	5.9	6.1	5.2	4.3	2.9	3.1
Heavy Fuel Oil	4.1	4.0	3.8	5.5	5.5	5.5	4.1	4.8	3.5	2.4	2.7	4.1	2.9	1.1	0.8	0.7	0.5	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	6.7	5.4	7.8	4.7	2.8	2.9	4.3	3.0	3.0	2.8	2.1	2.5	3.0	6.1	4.4	4.9	6.1	9.4	9.4	9.8
Natural Gas	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5	16.0	23.1	34.3	45.4	46.1
Light Fuel Oil and Kerosene	47.6	49.4	49.9	42.8	44.8	41.2	45.0	47.3	58.4	66.1	68.4	59.7	61.1	77.7	71.9	69.8	63.3	55.0	44.2	42.9
Heavy Fuel Oil	43.6	42.5	39.4	48.6	52.4	55.9	50.7	49.7	38.7	31.1	29.4	37.7	35.9	15.3	9.5	8.4	6.3	0.0	0.0	0.0
Steam	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	2.0	2.6	2.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.8	0.9	1.3	1.3	1.1	1.1
Activity																				
Floor Space (million m^2)	15.28	15.61	15.81	16.16	16.43	16.74	17.03	17.30	17.51	17.86	18.05	18.25	18.53	18.65	18.63	18.67	18.67	18.81	18.84	18.73
Energy Intensity (MJ/m^2)	**621.62**	**605.37**	**605.31**	**701.97**	**637.10**	**582.83**	**475.10**	**554.65**	**515.92**	**437.09**	**507.44**	**592.38**	**441.09**	**394.57**	**440.81**	**465.63**	**438.12**	**416.70**	**353.79**	**379.73**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; public administration; and others.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 45: Educational Services Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Educational Services[1] (PJ)*	**1.4**	**1.4**	**1.4**	**1.4**	**1.5**	**1.4**	**1.3**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.2**	**1.2**	**1.3**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (MJ/m^2)	**206.34**	**204.05**	**197.30**	**194.51**	**208.71**	**197.98**	**189.98**	**198.81**	**197.79**	**193.89**	**193.94**	**193.91**	**165.48**	**166.25**	**177.25**	**174.73**	**167.63**	**183.01**	**188.48**	**198.49**
Auxiliary Motors Energy Use for Educational Services[1] (PJ)	**0.6**	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.5**	**0.4**	**0.3**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (MJ/m^2)	**86.66**	**72.61**	**70.13**	**72.83**	**79.15**	**75.48**	**62.53**	**65.47**	**65.32**	**71.40**	**58.17**	**72.34**	**57.80**	**45.81**	**60.66**	**56.91**	**52.72**	**56.40**	**49.02**	**48.04**
Auxiliary Equipment Energy Use for Educational Services (PJ)	**1.0**	**1.0**	**1.0**	**1.2**	**1.3**	**1.3**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.4**	**1.4**	**1.5**	**1.5**	**1.5**	**1.4**	**1.5**	**1.6**
Energy Use by Energy Source (PJ)																				
Electricity	0.9	1.0	0.9	1.1	1.2	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.3	1.3	1.5	1.4	1.5	1.3	1.4	1.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Shares (%)																				
Electricity	92.5	92.2	92.5	92.3	91.3	91.0	90.7	91.4	91.4	95.1	94.9	95.0	95.1	94.9	95.1	95.0	97.4	93.6	93.6	93.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	7.5	7.8	7.5	7.7	8.7	9.0	9.3	8.6	8.6	4.9	5.1	5.0	4.9	5.1	4.9	5.0	2.6	6.4	6.4	6.4
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (MJ/m^2)	**142.64**	**152.52**	**147.03**	**170.19**	**184.67**	**178.19**	**172.94**	**183.60**	**185.45**	**197.48**	**198.42**	**204.17**	**182.95**	**186.23**	**202.53**	**196.38**	**203.48**	**180.77**	**194.54**	**207.33**
Water Heating Energy Use for Educational Services (PJ)	**0.6**	**0.5**	**0.5**	**0.6**	**0.7**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.7**	**0.7**	**0.5**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.3	0.3	0.4	0.4
Light Fuel Oil and Kerosene	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	2.7	1.8	1.6	3.1	6.4	6.2	5.9	6.2	6.4	8.7	17.5	11.1	6.6	5.0	5.9	5.9	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	2.0	2.0	3.3	4.7	3.4	12.2	20.0	23.0	34.3	34.9	69.5	62.0	61.0	66.6	73.6	80.9	80.3
Light Fuel Oil and Kerosene	59.7	56.1	60.3	65.9	65.4	62.2	52.4	63.2	31.5	10.1	14.3	20.6	6.3	7.6	9.8	8.7	5.4	3.5	2.3	2.2
Heavy Fuel Oil	4.8	0.9	0.1	2.4	6.2	11.1	12.2	8.8	18.8	21.4	12.1	12.1	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.8	41.2	38.0	26.6	20.0	17.2	24.8	18.3	31.1	39.8	33.2	21.8	16.3	17.9	22.2	24.4	23.0	17.9	11.8	12.5
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (MJ/m^2)	**84.11**	**79.09**	**75.89**	**93.45**	**103.09**	**89.72**	**79.57**	**88.30**	**83.81**	**72.95**	**74.86**	**93.94**	**96.86**	**73.40**	**77.27**	**77.69**	**68.16**	**60.96**	**65.81**	**64.49**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 46: Educational Services Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Educational Services (PJ)	**0.4**	**0.6**	**0.5**	**0.7**	**0.6**	**0.7**	**0.5**	**0.5**	**0.5**	**0.4**	**0.5**	**0.4**	**0.8**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.1**	**0.8**
Energy Use by Energy Source (PJ)																				
Electricity	0.4	0.6	0.5	0.7	0.6	0.7	0.5	0.5	0.5	0.4	0.5	0.4	0.8	0.7	0.7	0.8	0.8	0.9	1.1	0.8
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	4.33	4.47	4.61	4.75	4.87	5.01	5.07	5.10	5.15	5.24	5.40	5.49	5.56	5.62	5.75	5.79	5.81	5.92	5.97	5.99
Energy Intensity (MJ/m^2)	**102.76**	**135.71**	**115.18**	**139.12**	**113.46**	**141.22**	**102.55**	**93.09**	**104.28**	**70.65**	**85.35**	**71.48**	**136.01**	**116.38**	**116.75**	**134.60**	**141.35**	**143.70**	**178.48**	**134.10**
Space Heating Energy Use for Educational Services (PJ)	**4.3**	**4.3**	**4.3**	**4.2**	**5.8**	**4.7**	**4.1**	**4.9**	**4.3**	**3.4**	**2.8**	**4.2**	**4.1**	**3.7**	**4.2**	**4.5**	**4.2**	**4.1**	**3.4**	**3.7**
Energy Use by Energy Source (PJ)																				
Electricity	1.0	0.7	1.1	0.9	1.2	0.7	0.5	1.6	1.4	1.3	0.8	1.2	1.2	0.9	1.5	1.4	2.2	1.3	1.3	1.4
Natural Gas	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.6	0.6	0.6	1.2	1.2	1.4	1.1	1.2	1.0	1.7	1.6	1.7
Light Fuel Oil and Kerosene	2.1	2.4	2.4	2.0	2.6	1.6	1.0	0.4	0.2	0.3	0.4	0.7	0.3	0.9	1.0	1.0	0.5	0.5	0.3	0.3
Heavy Fuel Oil	0.5	0.2	0.1	0.4	1.0	1.2	1.4	1.6	1.1	0.4	0.3	0.5	0.9	0.1	0.1	0.2	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.7	0.9	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.7	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.3	0.3
Shares (%)																				
Electricity	23.8	17.3	25.1	20.5	19.8	15.9	11.5	32.9	33.4	38.1	27.1	28.4	29.4	24.6	36.1	32.0	51.2	33.0	36.7	37.3
Natural Gas	0.0	0.0	0.0	3.0	3.8	8.3	8.9	8.7	14.8	17.8	23.2	28.8	29.2	36.5	25.2	26.8	24.3	41.9	46.4	45.9
Light Fuel Oil and Kerosene	49.0	56.7	54.5	48.2	43.8	33.5	24.4	7.8	4.0	8.3	13.6	16.5	7.9	24.6	23.7	22.9	11.8	11.9	8.0	7.6
Heavy Fuel Oil	10.8	5.7	1.7	8.4	17.0	26.1	34.4	32.1	26.4	11.5	9.7	10.9	22.3	2.0	3.3	4.3	1.8	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.4	20.3	18.6	19.8	15.6	16.3	20.9	18.5	21.2	24.3	26.3	15.3	11.2	12.4	11.8	14.0	10.9	13.2	8.8	9.3
Activity																				
Floor Space (million m^2)	6.76	6.83	6.88	6.94	6.97	7.02	7.03	7.00	7.00	7.06	7.24	7.32	7.39	7.43	7.56	7.59	7.57	7.64	7.63	7.57
Energy Intensity (MJ/m^2)	**637.89**	**628.06**	**629.16**	**607.26**	**835.95**	**670.66**	**580.23**	**702.06**	**609.93**	**483.42**	**384.89**	**574.97**	**559.99**	**503.13**	**561.93**	**593.52**	**558.46**	**531.15**	**450.96**	**484.02**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 47: Health Care and Social Assistance Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Health Care and Social Assistance[1] (PJ)	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.3**	**1.4**	**1.4**	**1.4**	**1.4**	**1.4**	**1.2**	**1.3**	**1.4**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (MJ/m^2)	**368.26**	**364.18**	**352.13**	**347.15**	**366.57**	**346.95**	**332.91**	**348.60**	**346.63**	**339.89**	**339.91**	**340.00**	**290.22**	**291.60**	**310.93**	**306.53**	**294.07**	**321.06**	**330.66**	**348.22**
Auxiliary Motors Energy Use for Health Care and Social Assistance[1] (PJ)	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.3**	**0.4**	**0.4**	**0.3**	**0.4**	**0.3**	**0.3**
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (MJ/m^2)	**126.55**	**106.02**	**102.40**	**106.34**	**113.74**	**108.23**	**89.65**	**93.93**	**93.66**	**102.40**	**83.42**	**103.78**	**82.95**	**65.74**	**87.07**	**81.69**	**75.67**	**85.45**	**74.27**	**72.79**
Auxiliary Equipment Energy Use for Health Care and Social Assistance (PJ)	**1.4**	**1.5**	**1.4**	**1.7**	**1.8**	**1.7**	**1.7**	**1.8**	**1.8**	**1.9**	**2.0**	**2.1**	**1.9**	**1.9**	**2.2**	**2.1**	**2.1**	**1.9**	**2.0**	**2.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.9	1.1	1.0	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.5	1.6	1.4	1.5	1.7	1.6	1.9	1.4	1.5	1.6
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.3	0.5	0.5	0.5
Shares (%)																				
Electricity	67.9	71.3	67.6	70.3	73.8	75.3	76.0	71.7	71.7	75.2	76.7	76.5	75.0	78.7	77.6	78.1	88.0	76.3	76.3	76.3
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.1	28.7	32.4	29.7	26.2	24.7	24.0	28.3	28.3	24.8	23.3	23.5	25.0	21.3	22.4	21.9	12.0	23.7	23.7	23.7
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (MJ/m^2)	**353.60**	**378.13**	**364.52**	**422.00**	**450.62**	**433.85**	**421.02**	**447.27**	**451.53**	**480.96**	**483.16**	**497.37**	**439.28**	**447.16**	**486.38**	**471.64**	**488.70**	**434.15**	**467.23**	**497.95**
Water Heating Energy Use for Health Care and Social Assistance (PJ)	**0.8**	**0.7**	**0.7**	**0.9**	**0.9**	**0.8**	**0.7**	**0.8**	**0.8**	**0.7**	**0.7**	**0.9**	**1.0**	**0.8**	**0.8**	**0.8**	**0.8**	**0.6**	**0.7**	**0.6**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Light Fuel Oil and Kerosene	0.5	0.4	0.4	0.6	0.6	0.5	0.4	0.5	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Shares (%)																				
Electricity	2.7	1.8	1.6	3.1	6.4	6.2	5.9	6.2	6.4	8.7	17.5	11.1	6.6	5.0	5.9	5.9	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	2.0	2.0	3.3	4.7	3.4	12.2	20.0	23.0	34.3	34.9	69.5	62.0	61.0	66.6	73.6	80.9	80.3
Light Fuel Oil and Kerosene	59.7	56.1	60.3	65.9	65.4	62.2	52.4	63.2	31.5	10.1	14.3	20.6	6.3	7.6	9.8	8.7	5.4	3.5	2.3	2.2
Heavy Fuel Oil	4.8	0.9	0.1	2.4	6.2	11.1	12.2	8.8	18.8	21.4	12.1	12.1	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.8	41.2	38.0	26.6	20.0	17.2	24.8	18.3	31.1	39.8	33.2	21.8	16.3	17.9	22.2	24.4	23.0	17.9	11.8	12.5
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (MJ/m^2)	**201.54**	**189.50**	**181.83**	**223.91**	**243.10**	**211.08**	**187.20**	**207.87**	**197.18**	**171.69**	**176.16**	**221.14**	**235.27**	**178.29**	**187.73**	**188.75**	**178.08**	**141.07**	**152.27**	**149.23**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 48: Health Care and Social Assistance Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Health Care and Social Assistance (PJ)	**0.4**	**0.6**	**0.5**	**0.6**	**0.5**	**0.7**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.7**	**0.6**	**0.7**	**0.8**	**0.8**	**0.8**	**1.0**	**0.8**
Energy Use by Energy Source (PJ)																				
Electricity	0.4	0.6	0.5	0.6	0.5	0.7	0.5	0.5	0.5	0.4	0.4	0.4	0.7	0.6	0.7	0.8	0.8	0.8	1.0	0.8
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	2.62	2.71	2.79	2.83	2.88	2.96	3.03	3.07	3.09	3.14	3.20	3.29	3.36	3.47	3.56	3.55	3.55	3.58	3.57	3.58
Energy Intensity (MJ/m^2)	**166.35**	**219.75**	**186.51**	**225.27**	**180.68**	**224.49**	**162.92**	**148.00**	**165.70**	**112.30**	**135.65**	**113.41**	**215.87**	**184.72**	**185.33**	**213.69**	**224.39**	**228.12**	**283.35**	**212.89**
Space Heating Energy Use for Health Care and Social Assistance (PJ)	**3.9**	**3.9**	**3.9**	**3.6**	**5.1**	**4.2**	**3.7**	**4.4**	**3.8**	**2.9**	**1.9**	**3.4**	**3.7**	**3.4**	**3.9**	**4.1**	**3.8**	**3.6**	**3.0**	**3.3**
Energy Use by Energy Source (PJ)																				
Electricity	1.1	0.9	1.4	0.8	1.0	0.6	0.4	1.2	1.0	1.1	0.6	1.0	1.0	0.4	0.6	0.6	0.6	0.8	0.7	0.7
Natural Gas	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3
Light Fuel Oil and Kerosene	1.8	1.9	1.9	1.9	2.5	1.9	1.7	1.8	1.6	1.2	0.8	1.4	1.5	2.8	3.1	3.2	3.0	2.6	2.1	2.2
Heavy Fuel Oil	1.0	1.0	0.6	0.7	1.4	1.4	1.3	1.2	1.0	0.5	0.6	1.0	1.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	26.9	23.6	35.0	23.5	19.4	15.3	11.1	26.1	27.3	36.3	28.3	28.2	27.6	13.2	15.8	14.8	14.8	22.0	21.4	22.6
Natural Gas	0.0	0.0	0.0	2.5	3.0	6.0	5.2	4.5	3.1	3.2	1.5	1.7	3.5	2.8	2.0	2.2	3.7	5.8	9.2	9.4
Light Fuel Oil and Kerosene	45.8	47.9	47.3	52.9	48.6	44.5	46.9	39.6	42.9	42.7	40.3	40.4	41.1	81.8	79.1	78.9	77.6	70.9	68.1	66.6
Heavy Fuel Oil	25.3	25.9	15.1	18.8	27.2	32.4	35.0	28.2	25.0	16.2	29.3	29.2	26.8	1.5	2.5	3.4	2.7	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	1.9	2.6	2.6	2.3	1.8	1.8	1.8	1.6	1.7	1.6	0.7	0.5	1.0	0.7	0.7	0.8	1.2	1.3	1.2	1.4
Activity																				
Floor Space (million m^2)	3.87	3.92	3.95	3.92	3.90	3.92	3.98	3.99	3.97	4.00	4.05	4.15	4.22	4.34	4.43	4.40	4.38	4.37	4.32	4.29
Energy Intensity (MJ/m^2)	**1,020.21**	**999.82**	**995.29**	**916.72**	**1,311.09**	**1,062.73**	**921.90**	**1,110.43**	**961.11**	**728.74**	**480.68**	**825.67**	**876.03**	**787.33**	**879.46**	**928.95**	**874.08**	**831.34**	**705.83**	**757.57**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 49: Arts, Entertainment and Recreation Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Arts, Entertainment and Recreation[1] (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (MJ/m^2)	**234.65**	**232.05**	**224.38**	**221.20**	**227.80**	**214.86**	**206.13**	**216.02**	**214.59**	**210.48**	**210.47**	**210.65**	**179.91**	**180.72**	**192.73**	**190.01**	**182.28**	**199.01**	**204.96**	**215.85**
Auxiliary Motors Energy Use for Arts, Entertainment and Recreation[1] (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (MJ/m^2)	**98.55**	**82.57**	**79.74**	**82.82**	**86.38**	**81.92**	**67.84**	**71.14**	**70.86**	**77.50**	**63.13**	**78.58**	**62.84**	**49.79**	**65.96**	**61.88**	**57.32**	**61.33**	**53.31**	**52.24**
Auxiliary Equipment Energy Use for Arts, Entertainment and Recreation (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	94.7	94.7	94.7	94.3	93.3	93.3	93.3	93.3	93.0	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5	94.5
Natural Gas	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.7	0.7
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	5.3	5.3	5.3	5.3	6.3	6.3	6.3	6.3	6.5	5.0	5.0	5.0	5.0	4.9	4.9	4.9	5.0	4.9	4.8	4.8
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (MJ/m^2)	**162.71**	**173.98**	**167.72**	**194.14**	**202.18**	**193.98**	**188.22**	**200.12**	**201.83**	**215.05**	**216.00**	**222.48**	**199.52**	**203.05**	**220.90**	**214.21**	**221.96**	**197.18**	**212.21**	**226.16**
Water Heating Energy Use for Arts, Entertainment and Recreation (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	2.0	1.6	1.5	2.1	5.5	5.4	5.7	5.8	5.5	6.8	13.1	8.8	5.8	5.0	5.7	5.7	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	1.6	1.5	2.3	3.5	2.8	9.1	14.7	17.6	29.1	35.2	57.6	49.3	47.6	52.7	61.0	71.2	70.2
Light Fuel Oil and Kerosene	52.3	48.7	53.8	57.6	53.5	47.6	42.2	52.7	24.4	7.5	11.3	18.1	6.3	6.2	7.7	6.7	4.2	2.9	2.0	1.9
Heavy Fuel Oil	2.0	0.4	0.1	1.0	2.4	3.9	4.6	3.5	7.0	7.8	4.6	5.1	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	43.8	49.3	44.6	37.8	37.1	40.9	43.9	35.2	54.0	63.1	53.3	38.9	34.5	31.2	37.2	40.0	38.1	31.1	21.7	22.9
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (MJ/m^2)	**76.62**	**71.95**	**69.04**	**85.27**	**90.01**	**77.89**	**69.06**	**76.76**	**72.74**	**63.48**	**65.73**	**82.07**	**84.35**	**63.82**	**67.41**	**67.66**	**59.30**	**53.03**	**57.24**	**56.10**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 50: Arts, Entertainment and Recreation Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Arts, Entertainment and Recreation (PJ)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	0.24	0.25	0.26	0.27	0.27	0.28	0.29	0.30	0.30	0.32	0.33	0.34	0.35	0.35	0.36	0.37	0.37	0.38	0.39	0.39
Energy Intensity (MJ/m^2)	**116.87**	**154.32**	**130.99**	**158.22**	**123.84**	**153.25**	**111.25**	**101.15**	**113.15**	**76.70**	**92.63**	**77.65**	**147.88**	**126.51**	**126.94**	**146.38**	**153.71**	**156.26**	**194.09**	**145.83**
Space Heating Energy Use for Arts, Entertainment and Recreation (PJ)	**0.5**	**0.5**	**0.5**	**0.5**	**0.7**	**0.6**	**0.5**	**0.6**	**0.5**	**0.4**	**0.4**	**0.6**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
Light Fuel Oil and Kerosene	0.3	0.3	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Heavy Fuel Oil	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Shares (%)																				
Electricity	25.4	19.1	26.7	22.3	21.4	17.8	13.5	34.9	35.6	40.6	30.1	31.1	31.8	27.7	38.8	34.7	34.1	44.5	48.6	49.1
Natural Gas	0.0	0.0	0.0	2.9	3.8	8.2	8.7	8.4	14.4	17.0	22.3	27.7	28.2	35.0	24.1	25.7	32.8	34.7	37.8	37.2
Light Fuel Oil and Kerosene	48.0	55.5	53.4	47.2	42.9	32.7	23.8	7.6	3.9	8.0	13.0	15.9	7.6	23.6	22.7	22.0	16.0	9.9	6.5	6.1
Heavy Fuel Oil	10.5	5.6	1.7	8.2	16.7	25.5	33.6	31.2	25.6	11.0	9.3	10.5	21.6	1.9	3.1	4.1	2.4	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.0	19.9	18.2	19.4	15.2	15.9	20.4	18.0	20.5	23.4	25.3	14.8	10.8	11.8	11.3	13.4	14.7	11.0	7.1	7.5
Activity																				
Floor Space (million m^2)	0.72	0.74	0.75	0.76	0.76	0.78	0.79	0.80	0.80	0.85	0.86	0.88	0.90	0.92	0.93	0.94	0.95	0.97	0.97	0.96
Energy Intensity (MJ/m^2)	**725.53**	**714.29**	**715.51**	**691.49**	**912.85**	**728.07**	**629.52**	**762.89**	**661.87**	**525.20**	**419.92**	**625.92**	**608.84**	**546.90**	**610.99**	**645.39**	**607.27**	**577.58**	**490.38**	**526.33**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 51: Accommodation and Food Services Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Accommodation and Food Services[1] (PJ)	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.6**	**0.6**	**0.7**	**0.7**	**0.6**	**0.7**	**0.7**	**0.8**
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (MJ/m^2)	**334.49**	**330.78**	**319.84**	**315.31**	**324.71**	**306.27**	**293.83**	**307.93**	**305.90**	**300.04**	**300.01**	**300.27**	**256.45**	**257.60**	**274.72**	**270.85**	**259.83**	**283.68**	**292.16**	**307.68**
Auxiliary Motors Energy Use for Accommodation and Food Services[1] (PJ)	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (MJ/m^2)	**136.65**	**114.49**	**110.58**	**114.84**	**119.78**	**113.59**	**94.07**	**98.64**	**98.26**	**107.47**	**87.53**	**108.96**	**87.14**	**69.05**	**91.46**	**85.81**	**79.49**	**85.04**	**73.92**	**72.44**
Auxiliary Equipment Energy Use for Accommodation and Food Services (PJ)	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.8**	**0.7**	**0.8**	**0.8**
Energy Use by Energy Source (PJ)																				
Electricity	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.7
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	84.2	83.7	84.2	83.9	84.1	83.6	83.1	84.2	84.1	86.5	86.0	86.3	86.4	86.0	86.4	86.4	92.6	82.7	82.7	82.7
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	15.8	16.3	15.8	16.1	15.9	16.4	16.9	15.8	15.9	13.5	14.0	13.7	13.6	14.0	13.6	13.6	7.4	17.3	17.3	17.3
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (MJ/m^2)	**225.24**	**240.86**	**232.19**	**268.80**	**279.93**	**268.58**	**260.60**	**277.07**	**279.44**	**297.74**	**299.06**	**308.03**	**278.60**	**283.52**	**308.45**	**299.10**	**309.92**	**275.32**	**296.30**	**315.79**
Water Heating Energy Use for Accommodation and Food Services (PJ)	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**	**0.4**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Light Fuel Oil and Kerosene	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Shares (%)																				
Electricity	2.0	1.6	1.5	2.1	5.5	5.4	5.7	5.8	5.5	6.8	13.1	8.8	5.8	5.0	5.7	5.7	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	1.6	1.5	2.3	3.5	2.8	9.1	14.7	17.6	29.1	35.2	57.6	49.3	47.6	52.7	61.0	71.2	70.2
Light Fuel Oil and Kerosene	52.3	48.7	53.8	57.6	53.5	47.6	42.2	52.7	24.4	7.5	11.3	18.1	6.3	6.2	7.7	6.7	4.2	2.9	2.0	1.9
Heavy Fuel Oil	2.0	0.4	0.1	1.0	2.4	3.9	4.6	3.5	7.0	7.8	4.6	5.1	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	43.8	49.3	44.6	37.8	37.1	40.9	43.9	35.2	54.0	63.1	53.3	38.9	34.5	31.2	37.2	40.0	38.1	31.1	21.7	22.9
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (MJ/m^2)	**153.49**	**144.14**	**138.30**	**170.83**	**180.32**	**156.03**	**138.36**	**153.77**	**145.72**	**127.18**	**131.68**	**164.42**	**168.98**	**127.86**	**135.04**	**135.55**	**118.79**	**106.24**	**114.68**	**112.38**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 52: Accommodation and Food Services Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Accommodation and Food Services (PJ)	**0.2**	**0.3**	**0.3**	**0.4**	**0.3**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.3**	**0.2**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**0.5**
Energy Use by Energy Source (PJ)																				
Electricity	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	1.43	1.49	1.55	1.60	1.70	1.79	1.89	1.94	1.97	2.02	2.03	2.06	2.09	2.11	2.13	2.18	2.22	2.30	2.34	2.37
Energy Intensity (MJ/m^2)	**161.68**	**213.57**	**181.26**	**218.93**	**171.26**	**212.04**	**153.85**	**139.89**	**156.47**	**106.07**	**128.10**	**107.17**	**204.10**	**174.60**	**175.21**	**202.02**	**212.14**	**215.67**	**267.88**	**201.27**
Space Heating Energy Use for Accommodation and Food Services (PJ)	**1.9**	**1.9**	**1.9**	**1.8**	**2.6**	**2.2**	**2.0**	**2.4**	**2.1**	**1.6**	**1.1**	**1.8**	**2.0**	**1.8**	**2.0**	**2.1**	**2.0**	**2.0**	**1.7**	**1.8**
Energy Use by Energy Source (PJ)																				
Electricity	0.6	0.5	0.7	0.5	0.6	0.4	0.3	0.7	0.7	0.6	0.4	0.5	0.6	0.3	0.4	0.4	0.3	0.5	0.4	0.5
Natural Gas	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2
Light Fuel Oil and Kerosene	0.8	0.9	0.9	0.9	1.2	0.9	0.9	0.9	0.8	0.7	0.4	0.7	0.8	1.4	1.5	1.7	1.5	1.4	1.1	1.2
Heavy Fuel Oil	0.5	0.5	0.3	0.3	0.7	0.7	0.7	0.6	0.5	0.3	0.3	0.5	0.5	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	29.3	27.4	38.2	27.6	22.5	18.5	14.8	29.3	31.2	36.8	37.2	28.6	30.7	15.2	18.2	17.0	17.0	25.0	24.4	25.6
Natural Gas	0.0	0.0	0.0	2.3	2.9	5.8	5.0	4.3	2.9	3.2	1.3	1.7	3.4	2.8	1.9	2.1	3.6	5.6	8.9	9.1
Light Fuel Oil and Kerosene	44.3	45.6	45.0	50.1	46.7	42.8	44.9	37.9	40.6	42.3	35.3	40.2	39.3	79.9	76.9	76.8	75.6	68.2	65.6	64.0
Heavy Fuel Oil	24.5	24.6	14.4	17.8	26.2	31.2	33.5	26.9	23.7	16.1	25.6	29.1	25.7	1.5	2.4	3.3	2.7	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	1.9	2.4	2.5	2.1	1.7	1.7	1.8	1.5	1.6	1.6	0.6	0.5	0.9	0.7	0.6	0.8	1.2	1.3	1.2	1.3
Activity																				
Floor Space (million m^2)	1.92	1.95	1.99	2.01	2.09	2.15	2.25	2.28	2.30	2.33	2.34	2.36	2.38	2.40	2.40	2.45	2.48	2.55	2.56	2.58
Energy Intensity (MJ/m^2)	**992.26**	**972.77**	**968.56**	**896.81**	**1,244.78**	**1,004.53**	**870.65**	**1,049.71**	**907.82**	**688.69**	**471.84**	**780.80**	**828.33**	**744.23**	**831.45**	**878.26**	**826.38**	**785.98**	**667.32**	**716.24**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 53: Other Services Non-Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Lighting Energy Use for Other Services[1] (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (MJ/m^2)	**171.42**	**169.52**	**163.91**	**161.59**	**166.41**	**156.96**	**150.58**	**157.81**	**156.77**	**153.76**	**153.75**	**153.88**	**131.43**	**132.02**	**140.79**	**138.80**	**133.16**	**145.38**	**149.73**	**157.68**
Auxiliary Motors Energy Use for Other Services[1] (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (MJ/m^2)	**77.03**	**64.54**	**62.33**	**64.73**	**67.52**	**64.03**	**53.03**	**55.61**	**55.39**	**60.58**	**49.34**	**61.42**	**49.12**	**38.92**	**51.56**	**48.37**	**44.81**	**47.94**	**41.67**	**40.83**
Auxiliary Equipment Energy Use for Other Services (PJ)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Energy Use by Energy Source (PJ)																				
Electricity	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	94.7	94.7	94.7	94.3	93.3	93.3	93.3	93.3	93.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0
Natural Gas	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.7	0.7
Light Fuel Oil and Kerosene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	5.3	5.3	5.3	5.3	6.3	6.3	6.3	6.3	6.5	5.5	5.5	5.5	5.5	5.4	5.4	5.4	5.5	5.4	5.3	5.3
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (MJ/m^2)	**127.19**	**135.99**	**131.10**	**151.75**	**158.04**	**151.63**	**147.12**	**156.42**	**157.76**	**168.09**	**168.84**	**173.90**	**155.96**	**158.72**	**172.67**	**167.44**	**173.49**	**154.13**	**165.87**	**176.78**
Water Heating Energy Use for Other Services (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
Energy Use by Energy Source (PJ)																				
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Fuel Oil and Kerosene	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Fuel Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	2.7	1.8	1.6	3.1	6.4	6.2	5.9	6.2	6.4	8.7	17.5	11.1	6.6	5.0	5.9	5.9	5.0	5.0	5.0	5.0
Natural Gas	0.0	0.0	0.0	2.0	2.0	3.3	4.7	3.4	12.2	20.0	23.0	34.3	34.9	69.5	62.0	61.0	66.6	73.6	80.9	80.3
Light Fuel Oil and Kerosene	59.7	56.1	60.3	65.9	65.4	62.2	52.4	63.2	31.5	10.1	14.3	20.6	6.3	7.6	9.8	8.7	5.4	3.5	2.3	2.2
Heavy Fuel Oil	4.8	0.9	0.1	2.4	6.2	11.1	12.2	8.8	18.8	21.4	12.1	12.1	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[2]	32.8	41.2	38.0	26.6	20.0	17.2	24.8	18.3	31.1	39.8	33.2	21.8	16.3	17.9	22.2	24.4	23.0	17.9	11.8	12.5
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (MJ/m^2)	**63.55**	**59.76**	**57.34**	**70.60**	**74.76**	**64.69**	**57.36**	**63.75**	**60.41**	**52.62**	**53.98**	**67.80**	**69.96**	**53.01**	**55.82**	**56.13**	**49.25**	**44.05**	**47.54**	**46.59**

1) Lighting and auxiliary motors consume only electricity.
2) "Other" includes coal and propane.

Commercial/Institutional Sector

Atlantic

Table 54: Other Services Space Conditioning Secondary Energy Use by End Use and by Energy Source

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Space Cooling Energy Use for Other Services (PJ)	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Energy Use by Energy Source (PJ)																				
Electricity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shares (%)																				
Electricity	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Activity																				
Floor Space (million m^2)	0.59	0.60	0.61	0.62	0.63	0.64	0.63	0.63	0.63	0.62	0.62	0.61	0.60	0.59	0.57	0.56	0.55	0.54	0.54	0.53
Energy Intensity (MJ/m^2)	**91.36**	**120.63**	**102.39**	**123.66**	**96.77**	**119.77**	**86.95**	**79.05**	**88.42**	**59.94**	**72.40**	**60.71**	**115.62**	**98.91**	**99.25**	**114.44**	**120.18**	**122.17**	**151.75**	**114.02**
Space Heating Energy Use for Other Services (PJ)	**0.8**	**0.7**	**0.7**	**0.7**	**1.0**	**0.7**	**0.6**	**0.8**	**0.7**	**0.5**	**0.4**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**
Energy Use by Energy Source (PJ)																				
Electricity	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2
Light Fuel Oil and Kerosene	0.4	0.4	0.4	0.3	0.4	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Heavy Fuel Oil	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Shares (%)																				
Electricity	25.4	19.1	26.7	22.3	21.4	17.8	13.5	34.9	35.6	40.6	30.1	31.1	31.8	27.7	38.8	34.7	34.1	44.5	48.6	49.1
Natural Gas	0.0	0.0	0.0	2.9	3.8	8.2	8.7	8.4	14.4	17.0	22.3	27.7	28.2	35.0	24.1	25.7	32.8	34.7	37.8	37.2
Light Fuel Oil and Kerosene	48.0	55.5	53.4	47.2	42.9	32.7	23.8	7.6	3.9	8.0	13.0	15.9	7.6	23.6	22.7	22.0	16.0	9.9	6.5	6.1
Heavy Fuel Oil	10.5	5.6	1.7	8.2	16.7	25.5	33.6	31.2	25.6	11.0	9.3	10.5	21.6	1.9	3.1	4.1	2.4	0.0	0.0	0.0
Steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other[1]	16.0	19.9	18.2	19.4	15.2	15.9	20.4	18.0	20.5	23.4	25.3	14.8	10.8	11.8	11.3	13.4	14.7	11.0	7.1	7.5
Activity																				
Floor Space (million m^2)	1.35	1.34	1.34	1.34	1.33	1.31	1.29	1.28	1.26	1.24	1.21	1.20	1.17	1.14	1.11	1.08	1.05	1.03	1.01	0.99
Energy Intensity (MJ/m^2)	**567.11**	**558.33**	**559.28**	**542.46**	**715.17**	**570.36**	**493.32**	**597.92**	**518.74**	**411.66**	**329.23**	**490.74**	**477.35**	**428.78**	**479.04**	**506.01**	**476.12**	**452.84**	**384.47**	**412.66**
Heating Degree-Day Index	**0.95**	**0.95**	**0.99**	**0.98**	**1.02**	**0.94**	**0.85**	**0.92**	**0.97**	**0.99**	**0.87**	**0.93**	**0.80**	**0.86**	**0.97**	**1.03**	**0.94**	**1.03**	**0.95**	**0.99**
Cooling Degree-Day Index	**0.99**	**1.63**	**1.34**	**1.59**	**1.18**	**1.70**	**1.39**	**1.10**	**1.66**	**1.60**	**2.20**	**1.22**	**2.24**	**2.03**	**1.92**	**1.98**	**2.03**	**1.99**	**2.78**	**1.68**

1) "Other" includes coal and propane.

Request IR-7:

Residential and Commercial Heating and Heat Pumps (Section 4.4, pp 33-37)

(a) Please provide for all the forecast years:

1. **Total number of residential customers,**
2. **Number of customers using primarily electric resistance heating,**
3. **Number of customers using supplemental resistance heating,**
4. **Number of customers using heat pumps for primary heating,**
5. **Number of customers using heat pumps for supplemental heating,**
6. **Number of customers using heat pumps for cooling,**
7. **Number of customers using oil for heating,**
8. **Number of customers using natural gas or propane for primary heating,**
9. **Number of customers using other energy sources for primary heating.**

(b) Please indicate the number of new customers from 2023 through 2033 and the breakout of their space heating technology.

(c) Please provide supporting evidence for the 40 percent saturation of customers providing their heat via heat pumps in 2023 (p. 33).

(d) Please provide the data sources and the E3 estimates regarding the commercial heat pump saturation forecast.

(e) Please quantify, with underlying calculations, the differences between E3 and the current forecast in regards to peak load impacts as presented in Figure 23.

(f) Please provide the calculations used to obtain the 3922 kWh/year/household estimated heat pump energy impact for 2023.

(g) Please provide documentation of the E3 electrification model, RESHAPE.

(h) Please document the data that the RESHAPE model used for this forecast and its impacts on the forecast.

Response IR-7:

(a) Please see the following table estimating the number of customers for each category:

Year	Existing Residential Customers	Customers with Electric Resistance Primary	Customers with Electric Resistance Supplementary	Customers with Heat Pumps Primary Heating	Customers with Heat Pumps Supplementary	Customers with Heat Pumps for Cooling	Customers with Other Sources of Heating
2023	488,654	84,799	134,388	194,547	17,253	248,550	209,308
2024	488,654	82,035	136,216	212,789	19,836	268,968	193,829
2025	488,654	78,830	138,599	230,758	22,487	289,092	179,066
2026	488,654	74,713	142,060	248,190	25,033	308,630	165,751
2027	488,654	70,674	145,582	265,168	27,576	327,676	152,812
2028	488,654	67,035	148,814	281,377	30,058	345,874	140,242
2029	488,654	63,521	152,027	296,880	32,479	363,291	128,253
2030	488,654	60,125	155,212	311,730	34,840	379,986	116,799
2031	488,654	56,841	158,364	325,973	37,139	396,007	105,840
2032	488,654	53,727	161,407	339,405	39,337	411,124	95,522
2033	488,654	50,773	164,343	352,086	41,437	425,401	85,795

(b) Please refer to the following table estimating the heat sources for new customers (all numbers cumulative). Note that supplementary heating is not broken out for new customers, but is estimated to continue at a share of approximately 35 percent.

Year	New Residential Customers	New Customers with Heat Pump Heat	New Customers with Electric Baseboard Heat	New Customers with Non Electric Heating	New Customers with Supplementary Electric Heat
2023	6,177	3,706	1,544	927	2,162
2024	11,959	7,175	2,990	1,794	4,186
2025	17,540	10,524	4,385	2,631	6,139
2026	22,797	14,204	5,174	3,420	7,979
2027	27,676	17,619	5,905	4,151	9,686
2028	32,149	20,750	6,800	4,599	11,252
2029	36,247	23,619	7,620	5,008	12,686
2030	40,003	26,248	8,371	5,384	14,001
2031	43,446	28,658	9,059	5,728	15,206
2032	46,605	30,869	9,691	6,044	16,312
2033	49,503	32,898	10,271	6,334	17,326

(c) Calculations related to the saturations of end uses are provided in 2023 LFR Attachment 1 Residential Intensities. The heat pump saturation is estimated based on annual sales numbers from heat pump installers in the province.

(d) The data sources are as follows:

- End use intensity data provided by NS Power;
- reports from Heritage Gas[1]; and
- EIA Commercial Buildings Energy Consumption Survey (CBECS).

Please refer to Synapse IR-44 Attachment 2 for the heat pump details provided by E3.

(e-f) Please refer to Attachment 1.

[1] https://www.eastwardenergy.com/wp-content/uploads/2019/05/HGAS-3852-01-Gardner-Pinfold-Study-HiRes-WEB.pdf

(g-h) E3's RESHAPE model is designed to simulate diversified system-level building electrification load shapes. System diversity is captured in the model through a regionally specific sample of buildings representing the housing stock and fuel mix, temporal and spatial variability in temperature, and the mix of heat pump technologies adopted.

The residential building stock in Nova Scotia was characterized using data from Natural Resource Canada (NRCAN), NS Power, and the U.S. Energy Information Agency (EIA) Residential Energy Consumption Survey (RECS). Data from EOne on the average heating demand per household was used to determine the total residential service demand across the province. The share of homes using fuel oil, natural gas, electricity (resistance and heat pumps), or wood as their primary heating fuel was determined from NS Power provided data. NRCAN data on province-wide space heating fuel consumption and building stock was used to adjust the per household annual service demand of single family and multifamily homes by fuel type to capture variation in service demand in the building stock. E3 used a sample of homes in New England in the RECS dataset adjusted and scaled for Nova Scotia's residential fuel mix in the RESHAPE model to represent the provincial housing stock.

The commercial building stock in Nova Scotia was categorized using data from NS Power, EIA's Commercial Energy Building Survey (CBECS), and Eastward Energy. NS Power provided data on the number of small and general commercial customers that are not all-electric and all-electric and their space heating energy intensity (kWh/m2). Combined with floor area estimates for a typical small and medium/large commercial customer derived from CBECS, E3 estimated the space heating demand of non-electric and electric customers in the province. The province-wide service demand is summarized in Table 42. A sample of buildings from the New England region of the CBECS dataset was scaled according to the fuel mix derived from the NS Power and Eastward Energy data to represent the commercial heating service demand fuel mix in the province. Commercial heating demand was allocated to counties in Nova Scotia according to employment data from Statistics Canada.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	NS Power HP Energy (GWh)	E3 HP Energy (GWh)	NS Power HP Peak (MW)	E3 HP Peak (MW)	Additional Peak in Forecast (MW)
2025	100	26	47	47	0
2030	292	142	139	241	102

	Residential av	Residential Energy Diff		
2013	9,737.40	9,737		
2014	9,597.49	9,597		
2015	9,907.75	9,908		
2016	9,496.84	9,497		
2017	9,470.56	9,471		
2018	9,711.96	9,712		
2019	9,812.07	9,812		
2020	9,699.43	9,699	E3 Energy	
2021	9,640.38	9,640	Existing Customers	
2022	9,814.50	9,815	488,654	1
2023	9,843.91	9,844	0	1
2024	9,883.31	9,805	38	2
2025	9,826.27	9,679	72	2
2026	9,854.16	9,661	95	
2027	9,918.75	9,679	117	
2028	10,022.27	9,730	143	
2029	10,037.77	9,701	165	
2030	10,085.93	9,704	187	55
2031	10,134.85	9,710	208	
2032	10,224.00	9,755	229	
2033	10,230.46	9,726	247	

	E3 Peak	
2023	15.6	Peak impact that is already included
2024	23.3	
2025	31.1	
2026		
2027		
2028		
2029		
2030	99.7	
2031		
2032		
2033		

	General De	General De	Energy Diff	
2013	2725738	2,725,738		
2014	2668091	2,668,091		
2015	2694613	2,694,613		
2016	2664270	2,664,270		
2017	2647981	2,647,981		
2018	2729314	2,729,314		
2019	2713913	2,713,913		
2020	2462859	2,462,859		E3 Energy
2021	2577256	2,577,256		
2022	2635787	2,635,787		8.1
2023	2703164	2,703,164	0	16.2
2024	2713321	2,700,016	13,305	24.2
2025	2719763	2,692,288	27,474	32.3
2026	2737333	2,694,821	42,512	
2027	2748827	2,695,194	53,633	
2028	2768233	2,697,871	70,362	
2029	2775073	2,688,034	87,040	
2030	2786250	2,680,475	105,775	96
2031	2803035	2,678,076	124,960	
2032	2833411	2,688,318	145,093	
2033	2854880	2,685,438	169,442	

	E3 Peak	
2023	31.8	Peak impact that is already included
2024	47.7	
2025	63.6	
2026		
2027		
2028		
2029		
2030	188.8	
2031		
2032		
2033		

		Peak - Current Fcst	Peak - no HP Growth	Peak Diff
2023	1	2,010.69	2,010.88	-0.19
2023	2	1,941.02	1,941.18	-0.16
2023	3	1,757.42	1,757.54	-0.12
2023	4	1,346.06	1,346.09	-0.03
2023	5	1,106.07	1,106.07	0.00
2023	6	1,056.07	1,056.06	0.01
2023	7	1,163.97	1,163.97	0.00
2023	8	1,080.41	1,080.42	-0.01
2023	9	1,053.60	1,053.60	0.00
2023	10	1,160.20	1,160.24	-0.03
2023	11	1,507.70	1,507.76	-0.06
2023	12	1,761.76	1,761.88	-0.11
2024	1	2,027.63	2,003.33	24.30
2024	2	1,951.39	1,927.05	24.33
2024	3	1,767.14	1,748.07	19.07
2024	4	1,348.75	1,340.66	8.09
2024	5	1,109.81	1,106.41	3.40
2024	6	1,049.67	1,049.09	0.59
2024	7	1,167.80	1,167.81	-0.01
2024	8	1,096.58	1,096.58	0.00
2024	9	1,057.50	1,057.50	0.00
2024	10	1,161.78	1,158.47	3.32
2024	11	1,517.85	1,508.56	9.29
2024	12	1,779.66	1,763.14	16.53
2025	1	2,047.13	1,999.68	47.45
2025	2	1,974.91	1,927.32	47.59
2025	3	1,785.60	1,748.54	37.06
2025	4	1,355.44	1,340.20	15.24
2025	5	1,111.80	1,105.95	5.85
2025	6	1,049.62	1,049.54	0.08
2025	7	1,175.13	1,176.68	-1.55
2025	8	1,103.15	1,104.78	-1.62
2025	9	1,059.13	1,060.76	-1.64
2025	10	1,162.81	1,158.24	4.57
2025	11	1,523.51	1,507.92	15.59
2025	12	1,792.47	1,763.13	29.34
2026	1	2,061.99	1,999.76	62.23
2026	2	1,989.71	1,927.21	62.50
2026	3	1,802.05	1,753.29	48.75
2026	4	1,363.79	1,344.53	19.26
2026	5	1,116.73	1,110.00	6.74
2026	6	1,053.38	1,054.32	-0.94
2026	7	1,186.88	1,189.95	-3.07
2026	8	1,114.54	1,117.31	-2.76

		Peak - Current Fcst	Peak - no HP Growth	Peak Diff
2026	9	1,066.14	1,068.58	-2.44
2026	10	1,170.20	1,163.75	6.46
2026	11	1,537.32	1,515.17	22.15
2026	12	1,814.02	1,772.31	41.71
2027	1	2,085.35	2,006.50	78.85
2027	2	2,012.34	1,933.16	79.18
2027	3	1,824.71	1,762.61	62.11
2027	4	1,376.52	1,351.59	24.93
2027	5	1,125.02	1,115.90	9.12
2027	6	1,060.03	1,060.56	-0.53
2027	7	1,201.63	1,204.71	-3.08
2027	8	1,128.05	1,130.82	-2.77
2027	9	1,074.53	1,076.97	-2.44
2027	10	1,178.39	1,169.61	8.78
2027	11	1,551.02	1,522.37	28.65
2027	12	1,833.89	1,780.62	53.27
2028	1	2,110.85	2,011.65	99.20
2028	2	2,032.62	1,933.19	99.43
2028	3	1,848.62	1,770.13	78.49
2028	4	1,388.96	1,357.08	31.88
2028	5	1,132.42	1,120.38	12.04
2028	6	1,065.37	1,065.38	-0.01
2028	7	1,214.66	1,217.74	-3.08
2028	8	1,140.12	1,142.90	-2.78
2028	9	1,081.75	1,084.19	-2.44
2028	10	1,185.97	1,174.33	11.64
2028	11	1,565.00	1,528.37	36.63
2028	12	1,855.32	1,787.85	67.47
2029	1	2,133.35	2,014.54	118.82
2029	2	2,059.17	1,939.91	119.26
2029	3	1,870.50	1,776.11	94.39
2029	4	1,400.88	1,362.25	38.63
2029	5	1,139.95	1,125.07	14.88
2029	6	1,071.28	1,070.80	0.48
2029	7	1,228.50	1,231.60	-3.09
2029	8	1,152.86	1,155.64	-2.78
2029	9	1,089.53	1,091.97	-2.44
2029	10	1,193.76	1,179.35	14.41
2029	11	1,578.62	1,534.23	44.38
2029	12	1,875.52	1,794.26	81.26
2030	1	2,157.57	2,018.66	138.91
2030	2	2,083.01	1,943.59	139.42
2030	3	1,892.98	1,782.25	110.73
2030	4	1,411.31	1,365.73	45.58

		Peak - Current Fcst	Peak - no HP Growth	Peak Diff
2030	5	1,145.21	1,127.41	17.81
2030	6	1,074.30	1,073.30	1.01
2030	7	1,239.32	1,242.41	-3.09
2030	8	1,162.84	1,165.62	-2.78
2030	9	1,094.55	1,096.98	-2.43
2030	10	1,199.11	1,181.83	17.27
2030	11	1,590.33	1,537.97	52.36
2030	12	1,895.08	1,799.65	95.43
2031	1	2,182.60	2,023.62	158.97
2031	2	2,107.68	1,948.13	159.55
2031	3	1,916.07	1,788.96	127.11
2031	4	1,422.25	1,369.72	52.54
2031	5	1,150.92	1,130.18	20.74
2031	6	1,077.75	1,076.22	1.53
2031	7	1,250.50	1,253.59	-3.09
2031	8	1,173.12	1,175.89	-2.78
2031	9	1,099.86	1,102.27	-2.42
2031	10	1,204.83	1,184.69	20.13
2031	11	1,602.52	1,542.18	60.34
2031	12	1,915.12	1,805.50	109.62
2032	1	2,207.38	2,028.68	178.70
2032	2	2,127.44	1,948.37	179.07
2032	3	1,938.87	1,795.60	143.27
2032	4	1,433.26	1,373.87	59.39
2032	5	1,156.84	1,133.22	23.62
2032	6	1,081.49	1,079.45	2.04
2032	7	1,261.83	1,264.92	-3.09
2032	8	1,183.49	1,186.27	-2.78
2032	9	1,105.37	1,107.79	-2.41
2032	10	1,210.82	1,187.87	22.95
2032	11	1,614.92	1,546.71	68.21
2032	12	1,935.16	1,811.55	123.61
2033	1	2,233.24	2,033.14	200.11
2033	2	2,157.70	1,956.89	200.82
2033	3	1,962.60	1,801.77	160.83
2033	4	1,445.00	1,378.15	66.85
2033	5	1,163.38	1,136.62	26.75
2033	6	1,085.81	1,083.22	2.59
2033	7	1,273.56	1,276.65	-3.10
2033	8	1,194.19	1,196.98	-2.79
2033	9	1,111.32	1,113.73	-2.41
2033	10	1,217.46	1,191.45	26.01
2033	11	1,628.27	1,551.51	76.77
2033	12	1,956.35	1,817.51	138.84

Year	Total Cumulative New Installs	% Install Non-Elec. Heat	% Install Elec. Heat	Overall % Sat. for Heating	Overall Heating Intensity (kWh/house)	Overall % Sat. for Cooling	Overall Cooling Intensity (kWh/house)
2023	20,887	66	34	40	1,384	51	182

HP Energy 3915

Difference due to rounding

Request IR-8:

Residential Water Heaters (WH) (Section 4.4, p 37-38)

(a) Are more efficient hot water end-use devices considered in this analysis?

(b) What are the existing or proposed standards for improving hot water efficiency in the province?

(c) Does NSPI or E1 have a plan for promoting HP rather than resistance-based water heaters?

(d) How would the water heating load change if half of the new water heaters were HP based?

(e) Please provide an update of the joint pilot on controlling water heaters directly and looking at potential benefits to the system.

(f) Please describe the drivers for the increase in water heater saturation by 2033 in the current forecast compared to the 2022 forecast.

(g) It appears that the Intensity in Figure 25 represents an average that is increasing because the saturation is increasing. Please confirm if this is the driver. Please provide the intensity per electric water heating household for each year in Figure 25.

Response IR-8:

(a) Efficiency of water heaters is taken into account through the efficiencies portion of the intensity equation. This is based on EIA forecasts which show water heater efficiency increasing from around 92 percent in 2022 to 98 percent by 2033.

(b) Water heaters must meet the following standard as of 2008: CAN/CSA-C191-04, Performance of Electrical Storage Tank Water Heaters for Domestic Hot Water Service. NS Power is not aware of any proposed standards to improve efficiency.

(c) E1 presently offers rebates on three-element electric resistance water heaters and heat pump water heaters.

(d) This analysis has not been done for the forecast, and specific heat pump technology is not available for the forecast, but assuming the rate of adoption proposed in this scenario is higher than that in the underlying EIA efficiency data, the overall intensity of water heating would decrease.

(e) A summary of the pilot was provided in the report on pages 78-79.

(f) The increased saturation of electric water heaters (86 percent by 2032 in the 2023 forecast compared with 82 percent by 2032 in the 2022 forecast) is due to a greater number of heat pumps in this year's forecast – it is assumed that the hot water heater saturation will increase by half the amount of heat pump saturation as people convert their non-electric heating to heat pumps.

(g) Confirmed. Estimated intensity per electric water heating household (total intensity/share of household with electric water heat) is provided in the table below:

Year	Estimated Intensity (kWh/water heater)
2023	2,175
2024	2,160
2025	2,146
2026	2,132
2027	2,120

Year	Estimated Intensity (kWh/water heater)
2028	2,109
2029	2,099
2030	2,090
2031	2,082
2032	2,075
2033	2,069

1

Request IR-9:

Residential Electric Vehicles (EV) (Section 4.4, pp 38-43)

(a) **Please provide the source data and calculations used to produce the updated 2023 EV sales forecast in Figure 26.**

(b) **Please provide a detailed explanation of how the updated federal sales targets for EVs have been translated into the 2023 EV sales forecast that is presented in Figure 26.**

(c) **How do the daily load shapes for various types of electric vehicles correspond to NS's system load patterns? How does the peak demand pattern for electric vehicles correspond to NS's summer and winter peak demands?**

(d) **Please provide more details about E3's EV Load Shaping Tool and how it was used to produce the results for this forecast. Specifically, the calculations behind the values in Figure 27.**

(e) **Please provide an update on the status of the time of use tariffs currently in the pilot stage and the Company's future plans for deploying time of use rates.**

(f) **The Company assumes that 70 percent of EV charging is managed and 30 percent is unmanaged. Please provide any calculations used to product this assumption, and please explain in detail how the assumptions about EV load management relate to the Company's current and future planned rate offerings.**

(g) **Please provide the confidential version of the January 2023 Smart Grid Nova Scotia Semi-Annual Report as an attachment.**

(h) **Please provide the source data and calculations for Figure 28.**

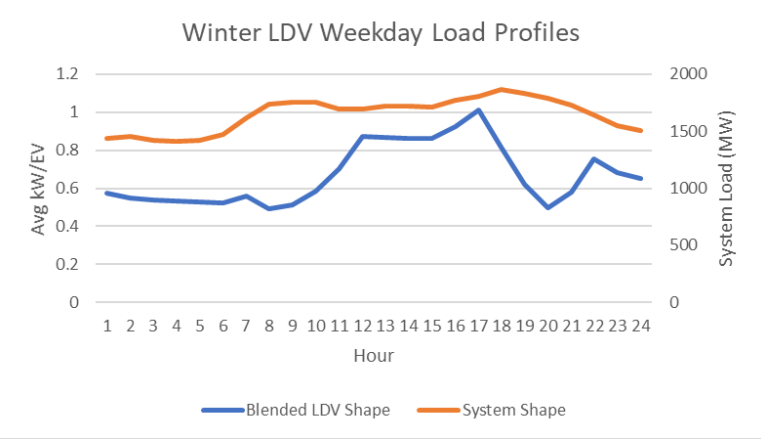
(i) Please provide the inputs and the calculations behind the results in Figure 30.

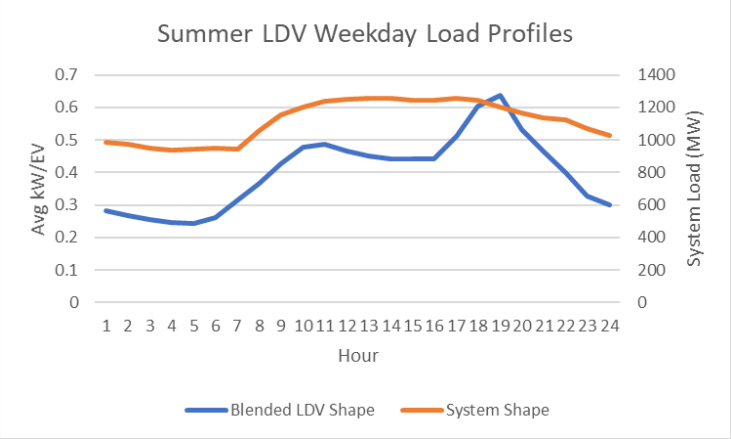
Response IR-9:

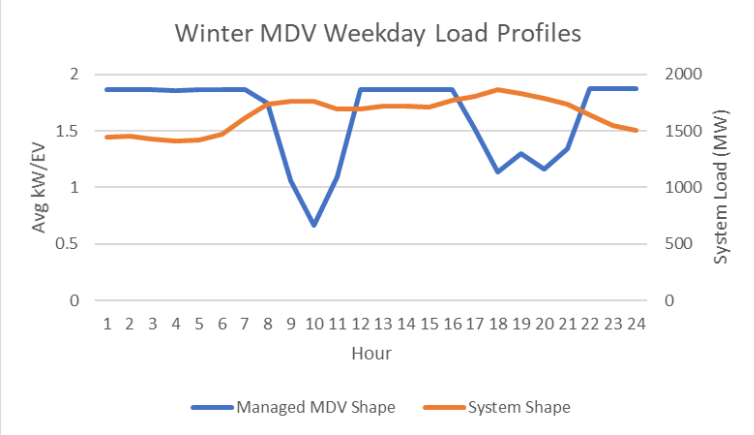
(a) Please refer to Attachment 1.

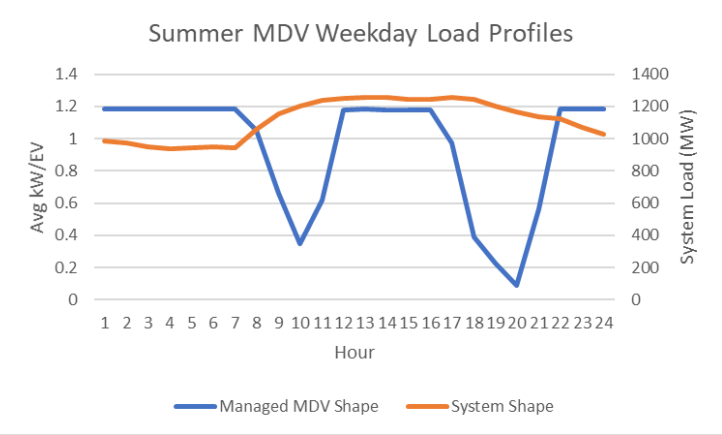
(b) Annual sales are forecast for the province and the mandated percentages are applied in each of 2026 (20 percent), 2030 (60 percent) and 2035 (100 percent) in accordance with the Federal sales targets, with interim years calculated to match the general uptake curve.

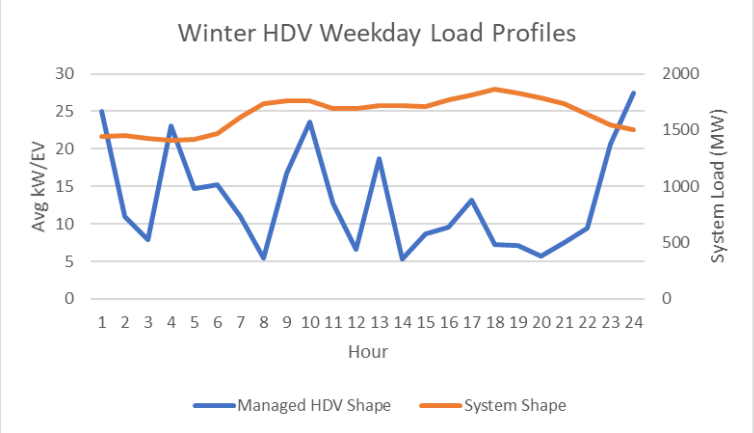
(c) The graphs below are examples of average vehicle load shapes for light duty vehicles (LDV), medium duty vehicles (MDV) and heavy duty vehicles (HDV) compared to the system load shape for a winter and summer weekday:

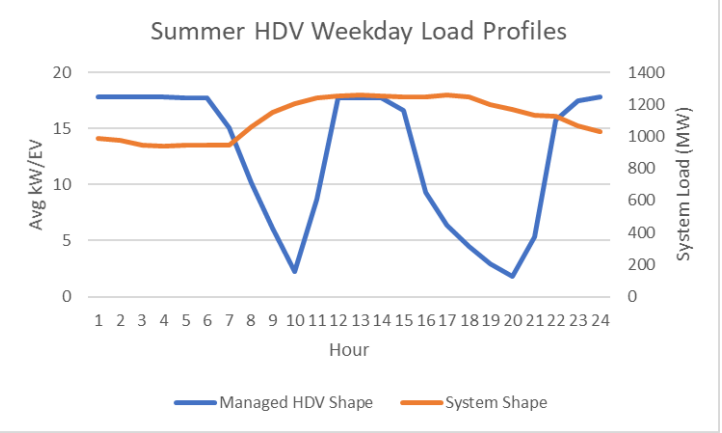












(d) E3 modelled differences in LDV driving behaviours between summer months and winter months; summer versus winter driving habits affecting average daily mileage which in turn affect charging behaviours. Charging profiles for transit buses and parcel trucks reflect relatively flat usage over the course of the year, with reduced efficiency in winter months.

A robust forecast of EV charging loads was developed in E3's EV Load Shape Tool. Charging loads depend on several factors, such as vehicle type, charging access, and the driving behaviour of drivers. To model charging behavior, E3 developed a bottom-up modelling approach that simulates driving and charging of thousands of EV drivers. Driving behaviour is captured using travel survey data and converted to 15-minute driving patterns though a Markov-Chain Monte Carlo method. The graph below shows an example

of LDV weekly driving patterns expressed as the probability that a driver is at a given location or is driving.



The driving population is characterized by drivers' EV type and access to charging. For LDVs, there are 4 EV types (short and long-range plug-in hybrid and short and long-rang battery electric vehicle) and 6 charging access types (a combination of access to residential, workplace, and public charging), resulting in 24 combinations or customer types. Loads for each customer type get weighted by the percentage of drivers forecasted to represent that customer type. The final load shape therefore captures the diversity of driving behaviour, EV types, and charging access across the Nova Scotia driving population.

Charging loads that feature drivers that plug in and begin charging immediately upon arrival at their destination reflect an unmanaged charging scenario. In this scenario, drivers still choose the location of their charging based on the relative electric rates at each location (for example, if a driver has the choice given their driving patterns and charger access to choose between more expensive public charging or less expensive residential charging, they will choose the less expensive residential charging). However, the timing of charging at a given location does not take into consideration any time-varying prices of electricity in an unmanaged charging scenario. In a managed charging scenario, drivers can shift the timing of their charging at a given location to minimize costs of charging based on time-varying electric rates.

A third charge management type, charge management with Vehicle-Grid Integration (VGI), still features drivers that shift their times of charging to minimize charging costs, but also features an aggregator's involvement to smooth peaks in charging that occur at transitions between peak and off-peak rate periods. The charging loads outputted from each charge management type get used with electric rates and electricity supply costs to calculate total bills and electricity supply costs for EV charging. In the blended scenario used for the forecast, 70 percent of EV owners manage their charging through an aggregator and 30 percent remain on flat rates with no shifting of charging times.

(e) Please refer to the response to Synapse IR-19.

(f) E3 assumes that 70 percent of EV customers will be responsive to TOU rates based on other jurisdictions. The managed charging could be achieved through a combination of direct load control, price response/tariffs, or subscription to an aggregator. For the purposes of the load forecast it is assumed that the managed charging will produce a reduction in peak demand compared to an unmanaged scenario, and the specific programs/tariffs will be developed over time to achieve those savings.

(g) Please refer to Partially Confidential Attachment 2.

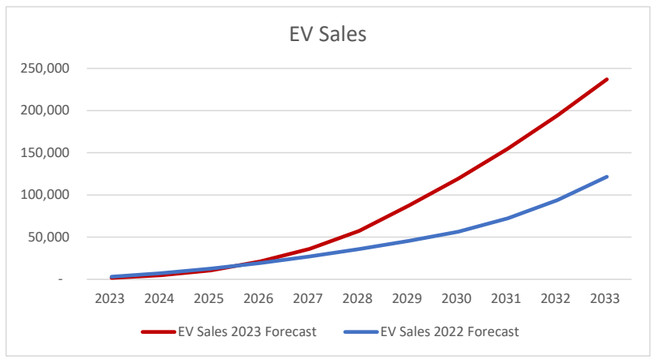
(h) Please refer to Attachment 3.

(i) Please refer to Attachment 1.

	kWh/year	kW/vehicle	kW/vehicle on peak (unmanaged)
LDV	4323	0.85	1.48
MDV	8205	1.62	1.06
Transit Bus	113890	7.33	27.70

	Home L1	Home L2	Workplace	Public L2	Public DCFC
Peak by Charging type	0.20	0.45	0.07	0.02	0.11

							Energy		Peak				
Year	**BEV tot**	**PHEV tot**	**MDV**	**HDV**	**Total**	**Cumlative from 2023**	**GWh**	**Cumulative from 2023**	**Peak MW**	**Avg kW per**	**Cumulative from 2023**	**Peak MW, unmanaged**	**Cumulative from 2023, unmanaged**
2022	585	329			914		3		0.8	0.85		1.4	
2023	1,684	895	53		2,633	1,719	10	6	2.3	0.87	2	3.9	3
2024	3,761	1,872	123	26	5,783	4,869	24	21	5.2	0.90	4	9.2	8
2025	7,703	3,562	211	65	11,540	10,626	50	47	10.4	0.90	10	18.7	17
2026	15,124	6,593	315	116	22,148	21,234	95	92	19.9	0.90	19	35.7	34
2027	25,783	10,738	436	199	37,156	36,242	161	158	33.3	0.90	33	60.0	59
2028	41,094	16,401	575	311	58,381	57,467	253	250	52.3	0.90	51	94.3	93
2029	63,090	24,129	729	428	88,377	87,463	380	376	78.7	0.89	78	141.7	140
2030	86,784	32,025	900	550	120,260	119,345	514	511	106.8	0.89	106	192.0	191
2031	113,311	40,654	1106	672	155,743	154,828	663	660	138.1	0.89	137	247.7	246
2032	142,826	49,949	1345	796	194,915	194,001	827	824	172.5	0.88	172	308.8	307
2033	175,452	59,939	1615	925	237,930	237,016	1,007	1,003	210.2	0.88	209	375.7	374



				Energy			Peak		
Year	**Res Charging (75% of LDV)**	**Commercial public LDV charging (25%)**	**Commercial MDV+HDV**	**Res Charging (75% of LDV)**	**Commercial public LDV charging**	**Commercial MDV+HDV**
2022	2.4	0.8	0.0	0.6	0.2	0.0
2023	6.9	2.3	0.4	1.7	0.5	0.1
2024	15.2	5.1	4.0	3.6	1.2	0.4
2025	30.7	10.2	9.2	7.3	2.3	0.8
2026	59.7	19.9	15.8	14.1	4.5	1.4
2027	101.0	33.7	26.2	23.6	7.5	2.2
2028	159.8	53.3	40.2	37.2	11.8	3.2
2029	243.7	81.2	54.8	56.4	18.0	4.3
2030	333.3	111.1	70.1	76.9	24.5	5.5
2031	433.3	144.4	85.6	99.6	31.7	6.7
2032	544.0	181.3	101.7	124.7	39.7	8.0
2033	666.0	222.0	118.6	152.3	48.5	9.4

Forecast for New Vehicle sales:

Inputs:

Population Census Profile, 2016 Census - Halifax [Census metropolitan area], Nova Scotia and Nova Scotia [Province] (statcan.gc.ca)

Census Year	2011	2016	2021
Ratio Halifax to NS	0.423	0.437	0.454
Halifax Population	390328	403390	439819
Nova Scotia Population	921727	923598	969383

2. Vehicle Sales: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2010000101

Geography	Nova Scotia																						
Vehicle type	Total, new motor vehicles																						
Month Index	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
Monthly Sales	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11
Units	2,566	3,242	4,404	5,106	5,113	6,046	4,037	4,001	3,963	3,229	3,092	2,844	2,303	2,796	4,532	4,483	4,597	5,115	4,307	4,047	3,764	3,518	3,323
Dollars (x 1,000)	77,619	95,581	136,024	155,590	149,350	179,195	125,850	113,148	115,588	95,628	93,101	91,944	69,145	83,806	128,228	128,784	131,457	151,316	124,635	118,375	112,762	105,698	95,459
Cars	1223	1637	2222	2587	2719	3239	2072	2144	1932	1621	1460	1400	990	1379	2379	2432	2575	2960	2307	1963	1815	1620	1549
Trucks	1343	1605	2182	2519	2394	2807	1965	1857	2031	1608	1632	1444	1313	1417	2153	2051	2022	2155	2000	2084	1949	1898	1774
Cars %	48%	50%	50%	51%	53%	54%	51%	54%	49%	50%	47%	49%	43%	49%	52%	54%	56%	58%	54%	49%	48%	46%	47%
Trucks %	52%	50%	50%	49%	47%	46%	49%	46%	51%	50%	53%	51%	57%	51%	48%	46%	44%	42%	46%	51%	52%	54%	53%

Vehicle sales Forecast:

Approximate sales in Halifax and rest of NS based on ratio of census population
Forecast begining 2022 assumes average of 2016 to 2021
Growth rate of 0.5% from 2023 to 2045

Year	NS Total	Halifax	Rest of NS
2012	48703	21271	27432
2013	52544	22949	29595
2014	53886	23535	30351
2015	55057	24047	31010
2016	54451	23782	30669
2017	58947	25746	33201
2018	52821	23070	29751
2019	51201	22363	28838
2020	39967	17456	22511
2021	44699	20280	24419
2022	51228	23242	27985
2023	51484	23359	28125
2024	51741	23475	28266
2025	52000	23593	28407
2026	52260	23711	28549
2027	52521	23829	28692
2028	52784	23949	28835
2029	53048	24068	28979
2030	53313	24189	29124
2031	53579	24310	29270
2032	53847	24431	29416
2033	54117	24553	29563
2034	54387	24676	29711
2035	54659	24799	29860

EV Sales based on mandates

Year	Total	Halifax	Rest of NS	PHEV	BEV
2020	442			26%	74%
2021	500			29%	71%
2022	914	557	357	36%	64%
2023	1666	952	714	34%	66%
2024	3053	1626	1428	32%	68%
2025	5632	2776	2855	30%	70%
2026	10452	4742	5710	29%	71%
2027	14804	6601	8203	28%	72%
2028	20975	9189	11785	27%	73%
2029	29723	12792	16931	26%	74%
2030	31988	14513	17475	25%	75%
2031	35606	16155	19451	25%	75%
2032	39633	17982	21651	24%	76%
2033	44115	20016	24100	24%	76%
2034	49105	22280	26826		
2035	54659	24799	29860		

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

2. Vehicle Sales:

Geography																								
Vehicle type																								
Month Index	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Year	2011	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2012	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
Monthly Sales	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13
Units	3,112	2,776	3,059	4,577	4,926	5,463	5,295	4,295	4,074	4,100	3,833	3,562	2,743	2,703	2,912	4,598	5,507	6,199	5,681	4,870	4,786	4,463	4,236	3,653
Dollars (x 1,000)	91,877	80,836	89,603	129,099	140,318	158,633	155,358	123,493	117,422	116,501	115,706	110,606	84,070	82,572	86,603	139,789	164,550	182,026	168,363	144,756	140,873	133,502	131,903	115,510
Cars	1373	1313	1497	2426	2808	3164	2952	2081	2089	2239	1956	1911	1341	1240	1500	2394	2976	3504	3122	2587	2471	2381	2108	1702
Trucks	1739	1463	1562	2151	2118	2299	2343	2214	1985	1861	1877	1651	1402	1463	1412	2204	2531	2695	2559	2283	2315	2082	2128	1951
Cars %	44%	47%	49%	53%	57%	58%	56%	48%	51%	55%	51%	54%	49%	46%	52%	52%	54%	57%	55%	53%	52%	53%	50%	47%
Trucks %	56%	53%	51%	47%	43%	42%	44%	52%	49%	45%	49%	46%	51%	54%	48%	48%	46%	43%	45%	47%	48%	47%	50%	53%

2. Vehicle Sales:

Geography																								
Vehicle type																								
Month Index	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Year	2013	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
Monthly Sales	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15
Units	2,936	2,473	3,185	4,623	5,494	6,009	5,240	5,506	4,881	4,651	4,453	3,834	3,537	2,532	2,586	3,726	5,914	6,707	5,390	5,835	5,270	5,141	4,505	4,044
Dollars (x 1,000)	91,403	76,870	96,420	140,938	164,851	181,335	160,022	166,798	146,561	149,008	138,867	120,153	116,388	85,042	83,416	117,528	185,428	208,385	182,758	187,626	166,648	169,689	147,614	133,178
Cars	1404	1131	1582	2306	2833	3179	2825	2774	2402	2037	2171	1783	1457	951	1134	1650	2921	3278	2298	2492	2206	1971	1674	1595
Trucks	1532	1342	1603	2317	2661	2830	2415	2732	2479	2614	2282	2051	2080	1581	1452	2076	2993	3429	3092	3343	3064	3170	2831	2449
Cars %	48%	46%	50%	50%	52%	53%	54%	50%	49%	44%	49%	47%	41%	38%	44%	44%	49%	49%	43%	43%	42%	38%	37%	39%
Trucks %	52%	54%	50%	50%	48%	47%	46%	50%	51%	56%	51%	53%	59%	62%	56%	56%	51%	51%	57%	57%	58%	62%	63%	61%

2. Vehicle Sales:

Geography																								
Vehicle type																								
Month Index	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Year	2015	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2016	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017
Monthly Sales	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17
Units	3,407	2,697	3,380	4,853	6,050	5,745	5,415	4,779	4,640	5,128	4,127	4,407	3,230	2,914	2,761	5,090	5,854	6,973	6,383	5,987	5,692	5,672	4,432	4,035
Dollars (x 1,000)	118,088	93,798	116,308	160,184	199,060	197,459	181,341	161,169	160,497	177,920	143,644	150,878	116,691	113,299	102,496	176,970	214,713	236,997	225,846	206,998	196,978	199,347	155,711	150,197
Cars	1107	863	1250	2069	2464	2300	1969	1679	1608	1947	1534	1599	975	912	781	1648	2306	2794	2227	2132	2317	1969	1503	1173
Trucks	2300	1834	2130	2784	3586	3445	3446	3100	3032	3181	2593	2808	2255	2002	1980	3442	3548	4179	4156	3855	3375	3703	2929	2862
Cars %	32%	32%	37%	43%	41%	40%	36%	35%	35%	38%	37%	36%	30%	31%	28%	32%	39%	40%	35%	36%	41%	35%	34%	29%
Trucks %	68%	68%	63%	57%	59%	60%	64%	65%	65%	62%	63%	64%	70%	69%	72%	68%	61%	60%	65%	64%	59%	65%	66%	71%

2. Vehicle Sales:

Geography																								
Vehicle type																								
Month Index	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Year	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019
Monthly Sales	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19
Units	3,154	2,672	3,146	4,488	5,456	6,509	5,822	5,126	5,027	4,652	4,032	3,308	2,583	2,699	2,968	4,708	4,936	5,674	5,952	4,613	4,970	4,394	4,179	3,504
Dollars (x 1,000)	119,806	97,025	111,411	162,401	196,141	232,734	207,393	183,508	184,522	165,943	149,840	130,601	101,530	101,091	107,560	178,730	189,645	213,547	226,410	176,081	190,428	185,616	162,613	137,832
Cars	1022	857	1146	1515	1983	2293	2082	1879	1405	1363	1168	941	615	755	816	1352	1483	1757	1729	1353	1260	1179	1071	802
Trucks	2132	1815	2000	2973	3473	4216	3740	3247	3622	3289	2864	2367	1968	1944	2152	3356	3453	3917	4223	3260	3710	3215	3108	2702
Cars %	32%	32%	36%	34%	36%	35%	36%	37%	28%	29%	29%	28%	24%	28%	27%	29%	30%	31%	29%	29%	25%	27%	26%	23%
Trucks %	68%	68%	64%	66%	64%	65%	64%	63%	72%	71%	71%	72%	76%	72%	73%	71%	70%	69%	71%	71%	75%	73%	74%	77%

2. Vehicle Sales:

Geography																								
Vehicle type																								
Month Index	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Year	2019	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
Monthly Sales	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
Units	2,604	2,687	2,892	2,165	1,633	2,940	4,024	4,431	4,576	4,569	4,212	3,130	2,708	2,786	2,993	4,432	4,847	3,449	4,770	4,785	4,030	3,900	3,299	2,960
Dollars (x 1,000)	108,135	107,934	111,490	88,078	69,473	120,403	153,652	177,101	182,456	181,079	166,536	127,389	110,260	112,937	123,385	178,528	199,716	142,190	198,640	204,243	168,698	160,611	142,321	145,956
Cars	539	604	640	545	329	697	934	969	1054	995	841	639	482	479	517	863	1092	768	1136	1137	878	942	704	568
Trucks	2065	2083	2252	1620	1304	2243	3090	3462	3522	3574	3371	2491	2226	2307	2476	3569	3755	2681	3634	3648	3152	2958	2595	2392
Cars %	21%	22%	22%	25%	20%	24%	23%	22%	23%	22%	20%	20%	18%	17%	17%	19%	23%	22%	24%	24%	22%	24%	21%	19%
Trucks %	79%	78%	78%	75%	80%	76%	77%	78%	77%	78%	80%	80%	82%	83%	83%	81%	77%	78%	76%	76%	78%	76%	79%	81%

2. Vehicle Sales:

Geography	
Vehicle type	
Month Index	12
Year	2021
Monthly Sales	Dec-21
Units	2,448
Dollars (x 1,000)	118,177
Cars	357
Trucks	2091
Cars %	15%
Trucks %	85%

	kWh/year	kW/vehicle on peak
LDV	4,323	0.85
MDV	8,205	1.62
Transit Bus	113,890	7.33

						2022 Energy		2022 Peak	
Year	**BEV tot**	**PHEV tot**	**MDV**	**HDV**	**Total**	GWh		Peak MW	Avg kW per car
2021	709	238			947	4		0.8	0.9
2022	1,768	1,096			2,864	12		2.4	0.85
2023	3,508	2,417	53		5,978	26	3,114	5.1	0.86
2024	5,962	4,146	123	26	10,258	48	7,394	9.0	0.88
2025	9,170	6,235	211	65	15,680	76	12,817	14.0	0.89
2026	13,168	8,633	315	116	22,232	110	19,369	20.0	0.90
2027	17,983	11,290	436	199	29,908	153	27,044	27.1	0.91
2028	23,636	14,149	575	311	38,671	204	35,807	35.4	0.92
2029	30,147	17,160	729	428	48,465	259	45,601	44.7	0.92
2030	37,565	20,284	900	550	59,299	320	56,436	54.8	0.92
2031	48,816	24,599	1106	672	75,192	403	72,329	69.3	0.92
2032	64,455	30,017	1345	796	96,612	510	93,748	88.6	0.92
					124,453		121,590		

Nova Scotia POWER
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January 31, 2023

REDACTED

Ms. Crystal Henwood
Regulatory Affairs Officer/Clerk
Nova Scotia Utility and Review Board
1601 Lower Water Street, 3rd Floor
Halifax, NS B3J 3S3

Dear Ms. Henwood,

Re: M09985 – CI C0010788 – Smart Grid Nova Scotia Project – Semi-Annual Report

In its Decision regarding the above noted matter, the Nova Scotia Utility and Review Board (NSUARB, Board) directed Nova Scotia Power Incorporated (NS Power, Company) to provide semi-annual reporting on the Smart Grid Nova Scotia Project (Project) as follows:

> …it is the Board's view that parties would be better informed if reports were filed on a semi-annual basis. The Board so directs, with reports due by July 31 and January 31, each year.[1][2]

The NSUARB elaborated on the content of the semi-annual reports as follows:

> NS Power suggested that annual reporting similar to the model used for the Intelligent Feeder Project (M07981) would be an appropriate model for the Smart Grid Nova Scotia project. Under that model, the annual reports could include progress updates on asset deployment and construction, customer selection criteria and outcomes, data and learnings regarding the various economic assumptions, details on any additional or refined metrics, details regarding business case development, general updates on broader data and learnings, EfficiencyOne's role and corresponding outcomes regarding demand response programs.
>
> The Board acknowledges that information such as that noted above should be provided in the project reports; however, additional information is also required. Details regarding the status and proposed implementation of programs and rate structures being developed for use under this pilot project are to be included in the

[1] M09519, NS Power CI C0010788 – Smart Grid Nova Scotia Project Application, NSUARB Decision, May 7, 2020, page 38, para 119.
[2] The NSUARB approved an extension to provide this semi-annual report from January 31, 2022, to February 18, 2022, by letter on January 28, 2022.

> reports. Also, the reports are to include financial details showing a breakdown of expenditures by category as presented in Figure 9 in the application. A further breakdown of expenditures related to each of the DER asset groups, and a breakdown of specific expenditure allocations against each of the funding partner contributions are to be provided in the reports.
>
> The SBA requested that NS Power should publicly share information regarding progress on the broader Smart Grid Atlantic Initiative. The Board directs that to the extent this can be done, either publicly or confidentially, such information is to be included in NS Power's project reports. In addition, copies of all reports that NS Power is required to file with the project partners and funding entities are to be included with NS Power's regular reports to the Board and Intervenors.[3]

In its subsequent Order, the NSUARB provided the following regarding reporting requirements:

> 1. The Board directs NS Power to include in progress reports and outcomes, a description of EfficiencyOne's role in the project and the extent of the collaboration between EfficiencyOne and NS Power.

//

> 4. The Board directs NS Power to publicly share information regarding progress on the broader Smart Grid Atlantic Initiative, to the extent this can be done, either publicly or confidentially, by including such information in NS Power's project reports. In addition, copies of all reports that NS Power is required to file with the project partners and funding entities are to be included with NS Power's regular reports to the Board and Intervenors.
>
> 5. The Board directs NS Power to file reports on a semi-annual basis, due by July 31 and January 31, which started July 31, 2020.[4]

In its Decision regarding the approval of the Solar Garden Rate Rider, the NSUARB also provided the following:

> NS Power accepted Synapse's recommendation that NS Power include the following statistics in its Smart Grid Project Reports to the Board:
>
> - generation by month;
> - annual generation compared to forecast generation;

[3] Ibid, pages 37 and 38 paras 116, 117, and 118.
[4] M09519, NS Power CI C0010788 – Smart Grid Nova Scotia Project Application, NSUARB Order, September 11, 2020, page 2 of 2.

- details about system outages, including the equipment involved, the length and cause of each outage, the steps NS Power expects to take to remedy the outages and how much time this will require;
- monthly program enrolment and exits (number of participants and subscribed capacity);
- low-income participation (to the extent possible);
- estimated average participant bill impacts by class; and
- estimated cumulative benefits to participants and non-participants.

However, in addition to the metrics discussed above, Synapse also recommended that NS Power post, on its website, a monthly report about the solar garden's performance, including the following information:

- total generation and average generation per kW for each of the past 12 months;
- details about equipment outages or replacements affecting solar garden output; and
- good faith forecasts of annual generation per kW for each of the next 5 years, taking into account expected panel degradation and historical trends in generation.

While NS Power agreed to provide this information, it proposed to do so in its semi-annual Smart Grid Project Reporting to the Board rather than by posting monthly reports on its website. NS Power said this would combine all data and learnings into a pre-existing reporting format providing increased regulatory efficiency. The Board accepts NS Power's reasoning about including the information in its semi-annual report and directs it to do so.[5]

NS Power provides the requested information in the sections that follow. This is the Company's sixth semi-annual report regarding the Project. The last report was filed with the NSUARB on July 29, 2022.

[5] NSUARB Decision, Smart Grid Nova Scotia Solar Garden Pilot Rate Rider, M10176, November 10, 2021, pages 17 and 18.

List of Attachments

- Attachment 1 – SGNS Updated Project Timeline
- Attachment 2 – SGNS Use Case Testing Update Report
- Attachment 3 – SGNS Use Case Testing Dashboard
- Attachment 4 – Solar Garden Specific Metrics
- Attachment 5 – SGNS Project Lessons Learned
- Attachment 6a – SIF Claim 15 Appendix A
- Attachment 6b – SIF Claim 15 Appendix B
- Attachment 6c – SIF Claim 15 Appendix C
- Attachment 6d – SIF Claim 15 Appendix D
- Attachment 7a – SIF Claim 16 Appendix A
- Attachment 7b – SIF Claim 16 Appendix B
- Attachment 7c – SIF Claim 16 Appendix C
- Attachment 7d – SIF Claim 16 Appendix D
- Attachment 8a – NRCan Smart Grid Claim 10
- Attachment 8b – NRCan Smart Grid Claim 10 Update
- Attachment 9a – NRCan Smart Grid Claim 11
- Attachment 9b – NRCan Smart Grid Claim 11 Update
- Attachment 10a – EVID Claim 10
- Attachment 10b – EVID Claim 10 Report
- Attachment 11 – SIF 2021/22 Annual Performance Benefits Report
- Attachment 12 – NRCan SG 2021/22 Annual Performance Report
- Attachment 13 – NRCan EVID 2021/22 Annual Performance Report
- Attachment 14 – SIF 2020/21 Annual Performance Benefits Report[6]

Overall Project Update

The Project remains on track to be on budget as described in the Financial Details and Expenditures section, below. The Project is progressing largely in accordance with the overall scope and timeline provided in the previous semi-annual report, with testing, data collection and analysis, and documented learnings as noted herein and provided in greater detail in the Smart Grid Nova Scotia (SGNS) Use Case Testing Update Report (**Attachment 2**) and in the SGNS Project Lessons Learned Report (**Attachment 5**). However, the timeline has been revised as detailed in the Project Schedule Update section below, and in the SGNS Updated Project Timeline (**Attachment 1**).

Project Schedule Update

Please refer to **Attachment 1** for the updated Project timeline. The changes to the timeline since the prior semi-annual report dated July 29, 2022 are outlined, below. None of the changes to the Project schedule will result in additional costs, change in or additional scope, or risks to the Project. The proposed changes extend testing and evaluation to provide additional time to complete data collection and evaluation. The Project timeline modifications include the following:

[6] The 2020/21 Annual Performance Benefits Report was submitted to the Strategic Innovation Fund (SIF) in August 2022.

- Energy System Platform (ESP) integration of one battery type (Tesla Powerwall) will extend into Q1 2023.
- Commercial and Industrial (C&I) Solar + Battery installation dates were extended beyond the original timeline; however, all installations have now been completed.
- Bi-directional charging installations and testing have been extended due to delays in charger availability. Installations will continue in 2023 and testing will be ongoing throughout 2023.

Asset Deployment and Construction

Asset deployment is now complete for all components of the Project, with the exception of residential (2 of 4) bi-directional charging stations, due to availability – as described in the Bi-directional Chargers section. Despite asset-specific challenges, noted below, and operating under conditions resulting from the COVID-19 pandemic, asset deployment progress has been successful to-date and has allowed the project to remain on schedule for completion in 2023. A summary of NS Power's progress for the reporting period for each asset class is described below.

SIEMENS ENERGY SYSTEM PLATFORM

The ESP is a key component of the Project. The ESP is a cloud-based platform designed to help utilities converge and manage distributed resources across their systems. The ESP platform can connect to a wide array of energy resources including solar photovoltaic (PV) and other generators, battery storage, commercial and industrial loads, smart water heaters, electric vehicle (EV) chargers, and microgrids.

- Solution Designs continue to be revised by Siemens and NS Power to meet the requirements of all use cases as additional asset integrations are completed, and as the functionality of ESP is enhanced.
- The Siemens ESP release R3b was installed and included specific functionality to support NS Power use cases for the completed integrations. Resolution for identified deficiencies is ongoing and will be required to enable the execution of the next use cases.
- Solution Designs are being revised by Siemens and NS Power to meet requirements of Sunverge battery storage related use cases. The conformance testing for the Sunverge battery storage systems integration to the ESP was completed and identified deficiencies continue to be remedied. Meanwhile, integration to the NS Power test environment has been completed and the NS Power pilot environment is simultaneously being prepared to begin running use cases once deficiencies are resolved.
- The remaining two customer Building Management System (BMS) integrations were completed in November 2022.
- The conformance testing for Tesla residential batteries is ongoing, between Siemens and Tesla, as an effort among Siemens, NS Power, and NB Power.
- The Siemens ESP User Guide was revised to incorporate the new asset and use case integrations and system capabilities with the most recent ESP releases as well as to

include specific details requested by NS Power project team.

- Training was provided for NS Power ESP users on the new functionality to support use cases.
- Data extract report designs and functionality for assets and events were developed during the reporting period and will be delivered in Q1 2023.

EV SMART CHARGING

- Use case testing continued through this reporting period with customers in both the ChargePoint and *ev.energy* programs. Similar to the previous reporting period, availability of chargers fluctuated as customers experienced vehicle or charger issues or were away from home for extended periods, and ongoing troubleshooting of ChargePoint connectivity with customer networks and warranty replacements continued. The pool of available chargers is nevertheless sufficient to investigate the impact of this type of distributed energy resource (DER) and how best to integrate it into the energy system in Nova Scotia.
- In September 2022, ChargePoint acknowledged that all ChargePoint Home Flex units procured for the Project could suffer from a Wi-Fi module defect that would disconnect the station from the home Wi-Fi and prevent it from reconnecting. Units that experience this failure must be replaced. NS Power outlined this defect in previous semi-annual reports and continued to experience the issue through the current reporting period. ChargePoint has taken accountability for the defect, has issued multiple firmware releases to the fleet in an attempt to resolve the issue; affected stations continue to be replaced, as required. Due to the impact of this defect on the fleet of chargers, use case testing has been extended into 2023 to ensure data is captured and analyzed from replaced/updated chargers.

BI-DIRECTIONAL CHARGERS

- Testing has continued with the Coritech bi-directional charger, installed at the Nova Scotia Community College (NSCC). Peak Reduction/Load Levelling and Generation Contingency use case testing began in August 2022. Renewable Generation Following modified use case testing, further described in **Attachment 2**, began in November 2022. NS Power is conducting this use case testing remotely through the Building Management System (BMS) in real time. NS Power and NSCC are exploring adding functionality to NSCC's BMS including manual event scheduling and automated demand charge management.
- Additional bi-directional charging station installations will support the completion of all planned use case testing. The status of the remaining chargers is as follows:
    - A Fermata 15kW bi-directional charger (UL certified) was installed in October 2022. However, bi-directional chargers are required to be Canadian certified. Fermata has agreed to provide a Canadian certified charger, to replace the UL certified 15kW charger, at no extra cost. The 20kW bi-directional charger is expected to be certified in Canada by February 2023 with delivery to NS Power in March/April 2023. Use case testing with the Fermata 15kW charger has begun – first with the EVSE3 use case (time-varying curtailment) but now following the

same use case schedule as the smart charging pilot, leading up to the replacement with the 20kW charger. Testing of demand charge management functionality began in December 2022.

- Delivery of the dcbel (formerly Ossiaco) bi-directional charger at the NSCC Institute of Technology Campus is forecast for spring 2023. Site preparation and rough-in work has been completed.
- The order for the Wallbox Quasar 2 bi-directional charger has been canceled given the lead time to procure it; NS Power will continue to monitor charger availability through the duration of the Project.
- The Ford Charge Station Pro (19.2 kW) is Ford's bi-directional compatible EV charging station. It is being explored as a possible additional bi-directional charging station to aid in the completion of all planned use case testing, in particular home backup. To provide bi-directional charging capability, the Ford Charge Station Pro needs to be paired with a Ford/Sunrun Home Integration System (HIS). NS Power has received a Ford Charge Station Pro charger but has not received a Sunrun HIS given delays in certification. NS Power will continue to work with vendors to obtain a HIS when it becomes available for purchase in Canada.

COMMUNITY SOLAR GARDEN

- A recurring current transformer (CT) failure was observed at the solar garden and was the source of a three-day outage at the end-of-June 2022. Upon further investigation, the failure was due to insulator tape coming into contact with the cabinet which caused grounding issues. This item has been resolved and noted for future installations.
- In August 2022, insulation was installed in the E-house[7] to mitigate condensation forming on the ceiling and moisture building up around electrical equipment. In addition, the insulation will decrease energy consumption of the heat pump located in the E-house.
- An antenna was installed in December 2022 to establish a radio link between the Solar Garden and the Control Centre in Ragged Lake. The radio link will allow connectivity to NS Power SCADA and PI historian systems. The existing PI system integration to Siemens ESP will provide access to solar garden generation data within ESP for use case testing. In addition, the radio link enables the NS Power Control Centre to remotely operate the recloser through SCADA.
- Details on solar garden production and performance are provided in Solar Garden Specific Metrics (**Attachment 4**).

[7] The E-house refers to the repurposed shipping container that houses the main low voltage electrical distribution and communication equipment on-site, at the Community Solar Garden.

DISTRIBUTED BATTERIES

- NS Power resolved a communication latency problem with the cellular modems initially deployed in the Sunverge LG installations that prevented over-the-air updates from completing successfully. The original communication deployment for modems deployed at these sites was on a corporate Private Access Point Name (APN). The connectivity was reconfigured to use customer internet or public cellular, which resolved these issues.
- NS Power continues to investigate an internal communication issue between the LG batteries and the LG inverter impacting up to a third of the Sunverge LG installations. This issue decreases battery reliability causing the battery to go into a standby mode, where it no longer accepts commands or performs as expected. Sunverge has recommended replacing the communication cable between the inverter and the batteries with a Cat5E shield cable. Two systems have been retrofitted so far, and NS Power is currently monitoring the status of these batteries to make sure the issue is resolved.
- Tesla installations continue to be onboarded into Tesla Powerhub for full utility control and visibility. Tesla integration with ESP is ongoing.

COMMERCIAL AND INDUSTRIAL SOLAR + BATTERY

- All three sites were commissioned and have received electrical certification.
- Additional functionality for zero export mode was implemented and tested during the current reporting period.
- As noted in the Project Schedule Update, solar array and Battery Energy Storage System (BESS) plants are energized and in operation at all customer sites. ESP integration activities are underway and will be completed in Q1 2023.
- Capacity and performance testing has been completed at two of the three sites. Testing of the last site, which was energized in December 2022, will be completed by Q1 2023.
- As-built drawings have been issued for the three sites.

COMMERCIAL AND INDUSTRIAL BUILDING MANAGEMENT SYSTEM

- Commercial and industrial (C&I) BMS helps building owners and operators optimize the use of energy in a commercial building. The C&I BMS scope involves the integration of customers' BMS with the Siemens ESP to control various equipment at three C&I sites. Of note, the three C&I BMS sites are not the same three sites participating in the C&I Solar + Battery scope, as described above.
- C&I BMS was an addition to the scope of the Project, defined in the July 29, 2022, semi-annual report[8], which allows for the inclusion of relevant DER demand response (DR) use case testing in alignment with DR work being explored with EfficiencyOne (E1).
- The C&I BMS program is considered Phase 1 of the E1/NS Power C&I DR pilot and will be coordinating program design and learnings with Phase 2 of the E1/NS Power C&I

[8] M09985, Nova Scotia Power - Smart Grid Nova Scotia Project - Semi-Annual Report, July 29, 2022, page 5 of 111.

DR pilot, which involves the procurement of a DR Aggregator by E1.

- Two customer BMS integrations were completed in November 2022 (the first was completed in February 2022, as previously reported) and testing at all three sites is ongoing.

Customer Programs

Section 3 of NS Power's Compliance Filing[9] provides an overview of the customer programs for each asset class under the Project. As of December 31, 2022, the structure of those customer programs is the same as outlined in NS Power's Compliance Filing, with the exception of the following updates:

- In order to continue use case testing in 2023, the EV Smart Charging program has been extended. The extension was provided to existing SGNS customers with a ChargePoint Home Flex EV Smart Charger who do not drive a Tesla vehicle. Program terms match those of the original program, outside of the $20 per month incentive in the form of a bill credit, which is roughly equivalent to the original $250 per year incentive and matches the existing *ev.energy* incentive. The program began on January 1, 2023 and will end on June 30, 2023. Participation is voluntary and customers must re-enroll, as outlined in the EV Smart Charging section.
- Due to technology constraints affecting Volkswagen eGolf vehicles in Canada, NS Power was unable to connect to these vehicles with *ev.energy*. Although initially advertised as eligible for participation in the EV Smart Charging program with *ev.energy*, three customers with Volkswagen eGolfs were deemed ineligible after applying. During this reporting period, the vehicle eligibility list was updated to include newer BMW models, iX and i4, in beta.
- The 10 Intelligent Feeder (IF) project's Powerwalls are planned for inclusion in the SGNS Project for corresponding use case testing. In exchange for giving SGNS control of their batteries, an incentive of $100 per year would be provided to those customers who agree to the use of their Powerwalls in the SGNS Project. [10]

An update on customer recruitment is set out below.

CUSTOMER CRITERIA AND SELECTION

EV Smart Charging

- The original EV Smart Charging program, with ChargePoint Home Flex, ended December 31, 2022. Ahead of the expiration of the original EV Smart Charging program with ChargePoint Home Flex, customers who do not drive Tesla vehicles were sent an offer to join an extension of the ChargePoint program using their SGNS provided ChargePoint Home Flex chargers to continue use case testing in the first six months of 2023.

[9] M09519, CI C0010788 – NS Power Smart Grid Nova Scotia Project Application, Compliance Filing, July 24, 2020, Section 3, pages 9-13.

[10] NS Power's letter to the NSUARB, M09984 – Intelligent Feeder Project (CI#49787) – Final Annual Report, November 18, 2022.

- At the end of the reporting period, 17 of an eligible 73 customers had enrolled in the extension of the original EV Smart Charging program. NS Power will continue to follow up with all eligible customers to maximize the number of customers who join the extended program. While the sample size will decrease, the pool of available chargers continues to remain relevant for additional testing to continue to validate the proposed use cases.
- The EV Smart Charging program with *ev.energy*, which launched in June 2022, added a total of 27 new customers and transitioned two Tesla drivers from the ChargePoint program in the current reporting period. As of December 31, 2022, there were 108 new customers, including 18 Tesla customers, in the program.
- The *ev.energy* program will remain open until the maximum budgeted participants have been onboarded. In December 2022, Tesla drivers in the original ChargePoint program were reminded they could still transition to *ev.energy* if they had not yet done so. Beginning January 1, 2023, all drivers who transitioned from the original ChargePoint program would be offered the $20 per month incentive payment, as the original ChargePoint program ended December 31, 2022.

Community Solar Garden

- Recruitment of applicants continued during the current reporting period.
- Residential capacity (1,200 MWdc) was initially fully subscribed on August 22, 2022. Following some customer turnover in the fall (a total of 7 cancellations in the current reporting period, representing 37.5 kW of capacity), residential capacity was again fully subscribed in December 2022 and remained so at the end of the reporting period.
- NS Power is no longer marketing residential subscriptions but continues to accrue a small amount of interest for residential subscriptions each month. Residential subscription requests are placed on a waitlist and contacted if capacity becomes available, in the order the application was received. Priority is given to residents of Amherst, per the terms of the rider. The waitlist had eight customers at the end of the reporting period.
- In August/September 2022, NS Power attempted a small direct sales campaign to eligible small businesses in Amherst and received no interest. Currently, the program has a maximum of 100 kW subscriptions. Some interest from larger customers have been received but declined by the customer after detailed discussion. NS Power will continue to market and sell directly to eligible commercial entities to continue to test demand of the commercial subscription product in 2023.

Battery Storage

- Please refer to update under Customer Programs, above, regarding the incorporation of IF Powerwalls into the SGNS Project.
- NS Power manages the program battery enrollment when participating customers sell their homes. In 2022, four homes with SGNS battery storage were sold and the new homeowners were successfully onboarded to the program.

Commercial and Industrial Solar + Battery

- As per the previous semi-annual report, participant agreements are complete with three C&I customer participants.
- Customer participants were provided access to monitor solar generation through the solar inverter manufacturer's web platform – Sunny Portal.

Commercial and Industrial Building Management System

- No update since last report.

CUSTOMER FEEDBACK & SURVEYS

To support the evaluation of DER use case customer benefits, qualitative customer feedback data is periodically collected from Project participants to observe and record individual experiences, perceived value, and satisfaction levels across programs. The aggregate customer experience data informs ongoing Project improvements and contributes to enhancing potential future program design. Results from customer surveys are included the Use Case Testing Update Report (**Attachment 2**).

Metrics, Data, and Learnings

Data collection on the use case testing continued with the solar garden, EV chargers, and EV telematics, and started for residential batteries and commercial BMS, in the current reporting period. Please refer to **Attachment 2** – Use Case Testing Update Report for information on data and learnings to date. The status of each use case being tested is provided in **Attachment 3** – Use Case Testing Dashboard. The blue shading in this attachment denotes where devices are connected, and where NS Power is gathering data and running use case tests as planned.

Please refer to **Attachment 4** – Solar Garden Specific Metrics, which includes the metrics previously included in this section of the semi-annual report. **Attachment 5** – SGNS Project Lessons Learned presents the Project to date lessons learned, previously a component of the Use Case Testing Update Report (**Attachment 2**).

Business Case Development

Consistent with previous semi-annual reports, as outlined in Section 2 of NS Power's Compliance Filing,[11] NS Power has developed a draft preliminary economic analysis model which will be further developed throughout the Project. Data collection and compilation is underway, including analysis of use case inputs on connected devices.

The final stages of business case development include capturing model inputs, which include both grid and customer benefits for utility-controlled assets. Future reporting will continue to provide updates on model inputs from use case testing, and the final report will present the economic analysis model with all inputs and assumptions identified.

[11] M09519, CI C0010788 – NS Power Smart Grid Nova Scotia Project Application, Compliance Filing, July 24, 2020.

January 31, 2023
C. Henwood

Financial Details and Expenditures

Please refer to **Figure 1** and **Figure 2** for the financial details of the Project. The Project remains on track to be on budget.

Figure 1 – Cost Table by Capital Type ($ millions)[12]

Expense Type	Cost Actual (at 31 Dec 2022)	Cost Budget
Labour	1.47	1.62
Contracts & Consulting	9.08	4.82
Materials/Application Software (ESP)	5.62	9.16
Travel & Other Expenses	0.11	0.38
Other Goods & Services	0.00	1.60
Overheads	1.36	1.07
AFUDC	0.31	0.31
Contributions	(11.13)	(11.90)
Total[12]	**6.81**	**7.05**

As reported in the January 2022 report, some costs originally budgeted under Materials were incurred within Contracts & Consulting. It was determined that procurement of the materials for the Solar Garden and C&I sites was more efficient to include in the contracts with the associated vendors. As a result, Contracts & Consulting costs will be higher than originally budgeted, and Materials costs will be lower.

[12] Capital cost categories have been amended from those shown in the July 2020 Semi-Annual report to better reflect the cost categories for the project.

Figure 2 – Costs and Funding Contribution by DER Asset Group ($ millions)

DER Asset	Cost Budget	Cost Actual (at 31 Dec 2022)	Funding Partner Allocation	
ESP	3.99	3.64	Province of NS SIF NRCan SG	0.20 [redacted] 1.29
EV Smart Chargers	1.95	1.69	NRCan EVID	0.83
C&I Solar PV + Batteries	4.87	4.62	SIF NRCan SG	[redacted] 0.96
Solar PV Garden	5.24	5.08	SIF NRCan SG	[redacted] 1.70
Residential Batteries	2.91	2.91	SIF NRCan SG	[redacted] 1.16
Total[1]	**18.95**	**17.94**	–	**11.13**

Role of EfficiencyOne

E1 serves an advisory role on the Project with engagement focused on commercial DR during the reporting period. NS Power continues to collaborate with E1 on broader DR efforts through the Demand Response Working Group (DRWG) and the technical team within the DRWG is engaged in commercial DR program development that ties into the Project.

The C&I BMS program is considered Phase 1 of the E1/NS Power C&I DR pilot, which includes coordinating program design and learnings with Phase 2 of the E1/NS Power C&I DR pilot to allow for comparison between the two Phases. The C&I BMS program will align testing with the single use case being tested as part of Phase 2 of the E1/NS Power C&I DR pilot, Critical Peak Reduction, and plans to test additional existing Project use cases that may be possible due to integration with the ESP to add to the value-stack and learnings of the Project.

Phase 1 progress during the reporting period concluded with the recruitment and integration of three participants to participate in DR events over the 2022/23 winter peak period. DR activities and events for Phase 1 are planned to continue through to February 2023.

[1] As figures in the table are rounded to the millions, totals may differ due to rounding.

Phase 2 progress during the reporting period included:

- Refinement of pilot design elements such as customer agreements, DR event criteria, E1's incentives and/or performance penalties, and customer baseline methodology.
- Work with the service provider/vendor to build connections to its web-based DER control platform for the purposes of scheduling and viewing Phase 2 pilot events, which includes a method for providing customer interval data.

Phase 2 pilot activities are planned to continue through February 2024.

External Reporting and the Smart Grid Atlantic Initiative

NS Power provides ongoing reporting to the federal funding programs as part of its funding program commitments. The reports provided since the last semi-annual report on July 29, 2022 are as follows:

Funding Claims to the Strategic Innovation Fund (SIF) –

- SIF Claim 15 Appendix A – **Attachment 6a**
  Partially Confidential – Third Party
- SIF Claim 15 Appendix B – **Attachment 6b**
  Non-confidential
- SIF Claim 15 Appendix C – **Attachment 6c**
  Confidential Excel – Third Party
- SIF Claim 15 Appendix D – **Attachment 6d**
  Partially Confidential – Third Party
- SIF Claim 16 Appendix A – **Attachment 7a**
  Partially Confidential – Third Party
- SIF Claim 16 Appendix B – **Attachment 7b**
  Non-confidential
- SIF Claim 16 Appendix C – **Attachment 7c**
  Confidential Excel – Third Party
- SIF Claim 16 Appendix D – **Attachment 7d**
  Partially Confidential – Third Party

Funding Claims to Natural Resources Canada (NRCan) Smart Grid (SG) Program –

- NRCan SG Claim 10 – **Attachment 8a**
  Partially Confidential – Commercial
- NRCan SG Claim 10 Update – **Attachment 8b**
  Non-confidential

- NRCan SG Claim 11 – **Attachment 9a**
  Partially Confidential – Commercial

- NRCan SG Claim 11 Update – **Attachment 9b**
  Non-confidential

Funding Claims to NRCan Electric Vehicle Infrastructure Demonstration (EVID) Program[13] –

- NRCan EVID Claim 10 – **Attachment 10a**
  Non-confidential

- NRCan EVID Claim 10 Report – **Attachment 10b**
  Non-confidential

SIF Annual Performance Benefits Report –

- SIF 2021/22 Annual Performance Benefits Report – **Attachment 11**
  Non-confidential – Excel

NRCan SG Annual Performance Report –

- NRCan SG 2021/22 Annual Performance Report – **Attachment 12**

Non-confidential

NRCan EVID Annual Performance Report –

- NRCan EVID 2021/22 Annual Performance Report – **Attachment 13**
  Non-confidential

SIF Annual Performance Benefits Report –

- SIF 2020/21 Annual Performance Benefits Report – **Attachment 14**
  Non-confidential – Excel

The following reports are due to be submitted at Project end: "Strategic Innovation Fund End of Project Reporting," "Natural Resources Canada Smart Grid End of Project Reporting," and "Natural Resources Canada EVID Funding End of Project Reporting."

[13] The Claim 11 report for NRCan's EVID program was not submitted within the July to December 2022 report period. This report will be submitted in the following semi-annual reporting period (i.e. January to June 2023), and will be included as an attachment to the July 2023 semi-annual report.

Confidentiality

Pursuant to Rule 12 of the Board Regulatory Rules, NS Power requests confidential treatment of certain portions of the Attachments filed with this report. NS Power support for its request is provided below in accordance with Rule 12(4).

Commercial Information

- **Attachment 6c** – SIF Claim 15 Appendix C
- **Attachment 7c** – SIF Claim 16 Appendix C
- **Attachment 8a** – NRCan SG Claim 10
- **Attachment 9a** – NRCan SG Claim 11

Confidentiality was applied to costs associated with invoice-level contractor payments and personnel hourly compensation rates. As Excel files cannot be partially redacted, they are deemed fully confidential.

To protect value for customers and mitigate the risk of prospective proponents having access to the information itemized above, and maintain good business relations with vendors, this information is confidential.

The more a supplier is aware of NS Power's specific requirements and a competing vendor's costs, the better the supplier's ability to obtain the highest price, reduce competition and increase the cost for NS Power and its customers. Higher prices, or avoidable contractual constraints, will result in unnecessary higher costs to customers.

In addition, NS Power seeks to keep the terms and conditions of suppliers' pricing and arrangements confidential from their other customers or potential competitors. This prevents competitors from using the information to gain a competitive advantage. This is equally true for NS Power, which desires to protect its ability to acquire services and equipment on the most competitive terms. Those "best" terms may not be available if there is a risk that they will be disclosed to the customers or competitors of the supplier.

Since NS Power customer rates are cost-based, the maintenance of confidentiality for these items is to the direct benefit of customers.

Third Party Proprietary

- Figure 2 (Partially Confidential)
- **Attachment 6a** – SIF Claim 15 Appendix A
- **Attachment 6c** – SIF Claim 15 Appendix C
- **Attachment 6d** – SIF Claim 15 Appendix D
- **Attachment 7a** – SIF Claim 16 Appendix A
- **Attachment 7c** – SIF Claim 16 Appendix C
- **Attachment 7d** – SIF Claim 16 Appendix D

Figure 2 and Attachments 6a, 6b, 6c, 7a, 7b and 7c include SIF funding claim percentages and amounts which have not been released publicly by government. The release of these

percentages and amounts could negatively impact government negotiations with other funding recipients; accordingly, the Government of Canada's SIF program has requested confidential treatment of these figures.

Attachments 6d and 7d are joint progress reports compiled by the Smart Grid Atlantic Initiative members, namely Siemens, NB Power, and NS Power, and as such feature details specific to Siemens' and NB Power's involvement. The Project partners have advised that they consider those details confidential, and as such have requested confidential treatment of those details.

NS Power will file its next semi-annual report, as directed, by July 31, 2023. The final project report is currently expected to be filed by December 31, 2023.

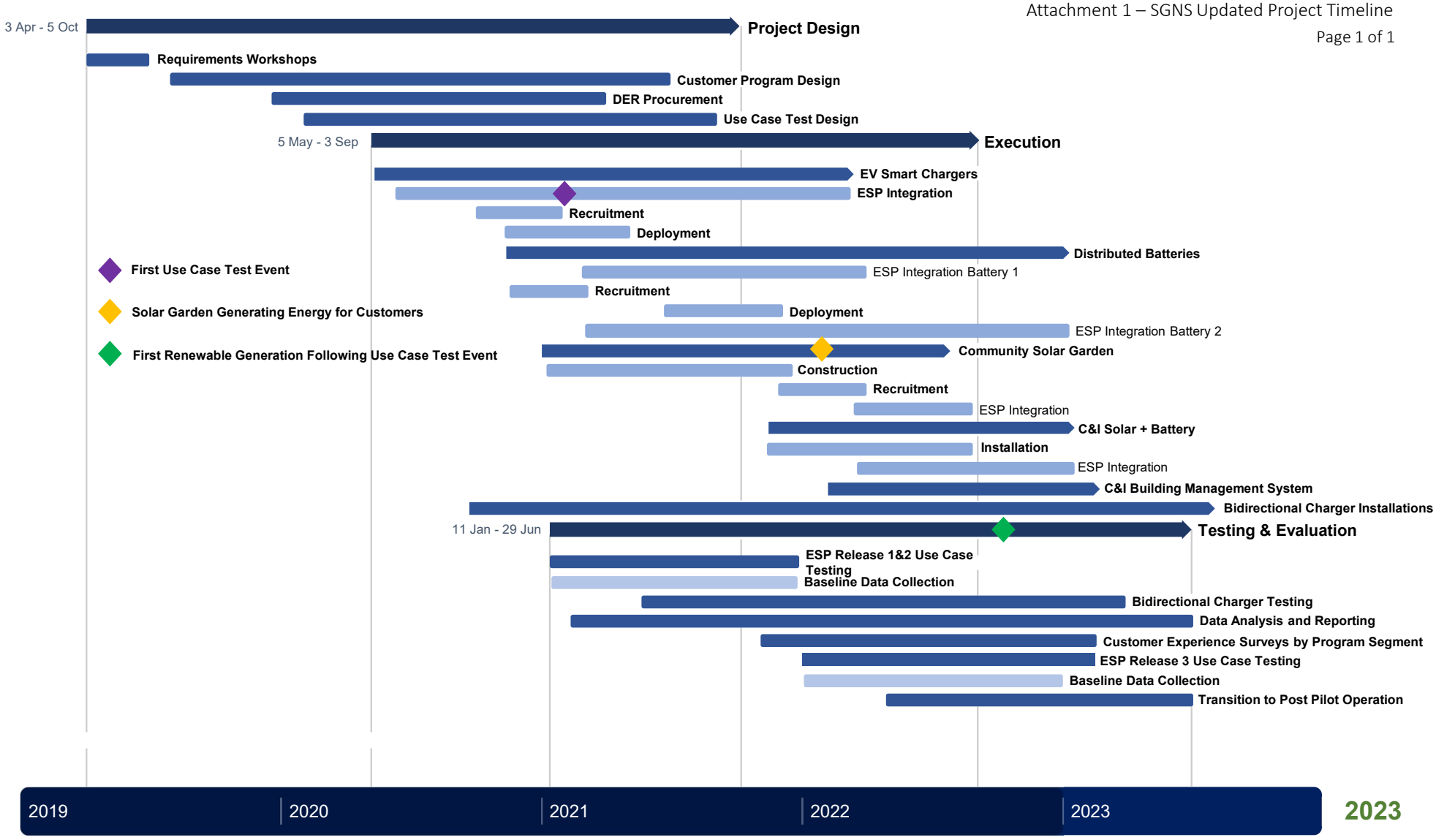
Yours truly,



Mark Peachey, LLB
Manager, Capital Filings

c. Judith Ferguson, EVP Reg, Legal & Bus Planning
Lia MacDonald, VP, Customer Experience & Innovation

Attachment 1 – SGNS Updated Project Timeline
Page 1 of 1



SGNS Use Case Testing Update Report

January 31, 2023

SGNS USE CASE TESTING UPDATE REPORT

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1.0 INTRODUCTION

The Smart Grid Nova Scotia (SGNS) Project is designed to gather data and learnings on the effectiveness of Distributed Energy Resource Management Systems (DERMS) in enabling central utility control of Distributed Energy Resources (DERs). Accordingly, use case metrics have been developed for the corresponding assets under the scope of the Project, which will measure potential technical and economic benefits of DERs controlled, by the utility, through a DERMS. Potential technical and economic benefits associated with a DERMS solution are expected to provide value and benefit to all customers, regardless of participation in DER programs.

Included in the SGNS Compliance Filing, NS Power submitted "Attachment A – SGNS Project Testing Matrix" to outline use case testing progress. Project use case testing has been underway since January 2021, as identified in Attachment 3 – SGNS Use Case Testing Dashboard. Blue shading indicates where devices are connected, and NS Power is gathering data and running use case tests as planned. Green shading will indicate enough data has been collected to apply to the Financial Model. A draft version of the financial model was submitted in the Compliance Filing Attachment C.

Any modifications to the testing throughout the project will be identified in Section 2.0, while Section 2.1 lists any modifications to the testing during the current reporting period. This report provides detail and context to the testing NS Power is performing and the data NS Power is collecting for the SGNS Project.

2.0 MODIFICATIONS TO TESTING PLANS

- Addition of data collection for 'Commercial & Industrial (C&I) Customer Demand Reduction' under 'electric vehicle (EV) vehicle-to-grid (V2G) Chargers,' as highlighted in Attachment 3.[1]
- Customer Tesla vehicles continue to be excluded from use case events to protect from undue risks placed on Tesla protection systems. The project team is developing additional testing to understand what conditions trigger the Tesla protection system and working with the vendor and participant customers to minimize risk.[2]
- Addition of managed EV charging by connection to vehicle telemetry using *ev.energy* platform. Although no integration to the Energy System Platform (ESP) will be completed, the project team will align events with other use cases, as applicable, to compare and contrast the different approaches. Tesla vehicles that were excluded from previous events will be managed on *ev.energy*, along with up to 100 additional vehicles, which are mostly Tesla vehicles.[3]
- Addition of Commercial and Industrial Building Management System (BMS) controls for Demand Response (DR) has been added to the testing matrix. ESP integration was included in scope.[3]

[1] Modification first reported in July 2021 Semi-Annual Report.
[2] Modification first reported in February 2022 Semi-Annual Report.
[3] Modification first reported in July 2022 Semi-Annual Report.

2.1. MODIFICATIONS DURING CURRENT REPORTING PERIOD

- Wind Following use case, modified from the original EVSE4 use case, for *ev.energy* was added in November 2022. Additional details are discussed in Section 3.1.2.
- Addition of the use case BMS10 – Critical Peak Reduction to the C&I BMS program. Additional details are discussed in Section 3.7.2.

3.0 DATA COLLECTION AND OBSERVATIONS

3.1. EV SMART CHARGING

3.1.1. OBSERVATIONS

BASELINE DATA OBSERVATIONS

ChargePoint

The first installations of smart chargers occurred in January 2021. Baseline data has been collected from active smart chargers within the program from January 2021 onwards. 'Baseline' data excludes energy consumed as part of any test event. The consumption is therefore uninfluenced. The data and subsequent observations are distinct from data and observations drawn from test events. All consumption data is based on energy used at the charger level. Figure 1 accounts for data collected from January 1, 2021, to December 31, 2022. Baseline data is considered for days without events, excluding holidays.

To date, aggregated charging data was extracted from the ChargePoint portal and analyzed using Microsoft Excel. The project team has worked closely with the Siemens development team to design and deploy tools to extract raw project data from ESP.

ev.energy

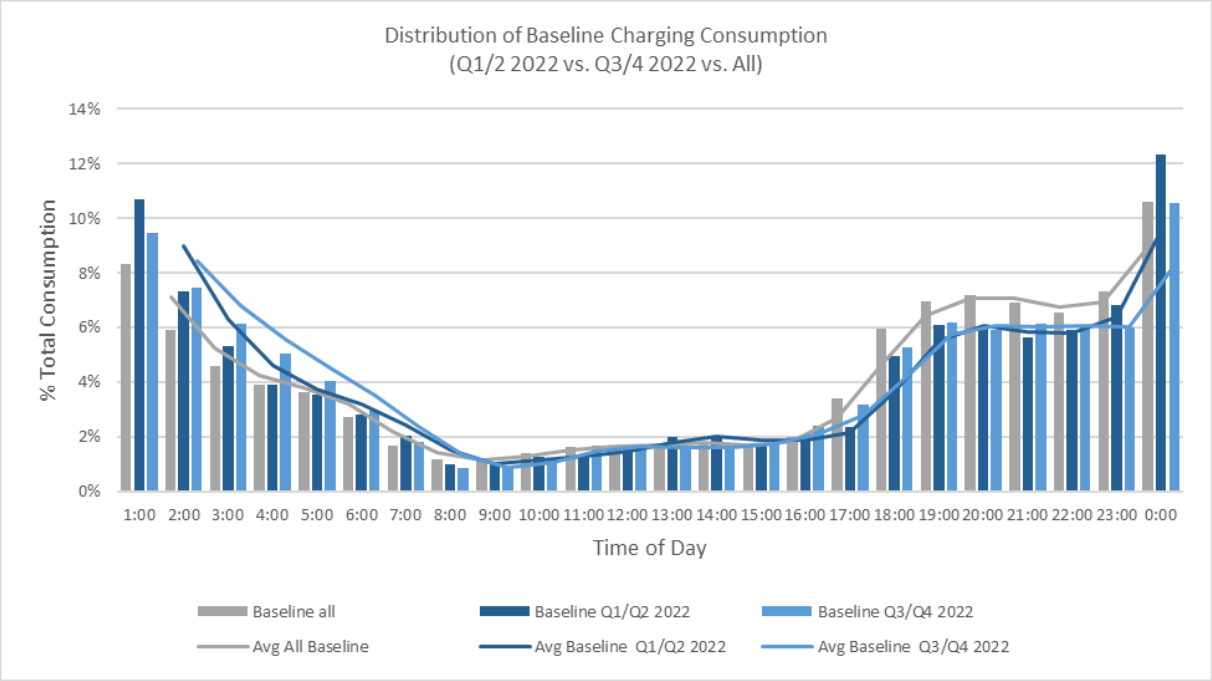
Data capture began on June 14, 2022 and occurred throughout this reporting period. By the end of the current reporting period, 108 customers were enrolled in the *ev.energy* pilot. Eighteen of these customers were Tesla vehicles transitioned from the ChargePoint user group, all of which were removed from the ChargePoint baseline data for this period.

BASELINE ENERGY CONSUMPTION BY HOUR

ChargePoint

Updated baseline data collection was consistent with the results in the July 2022 report. Distribution of charging by hour of the day in Q3/Q4 2022 showed a lower distribution in the evening period, which shifted into the early morning hours, as shown in Figure 1**.** The highest energy consumption period remains the 23:00 through 00:00 hours. Figure 1 shows the comparison of previously reported average baseline data to the overall average baseline EV consumption for each hour of the day from January 2021 to December 31, 2022.

Figure 1 – Average Baseline EV Consumption for Each Hour of the Day



ev.energy

As *ev.energy* uses an algorithm to schedule smart charging throughout the 24-hour period that prioritizes the driver's vehicle 'ready by' time, the baseline is presented as a calculated counterfactual to what was actually measured. The counterfactual is calculated to display the energy delivered as if charging started immediately when the vehicle was plugged in (as if it was uninfluenced by the scheduling algorithm or any events issued by the utility). As shown in Figure 2, this counterfactual review indicates that the 22:00 to 23:00 period is the highest consumption throughout the reporting period.

Figure 2 – *ev.energy* Data Baseline Plot – June 14 to December 31, 2022, by Hour (Counterfactual)

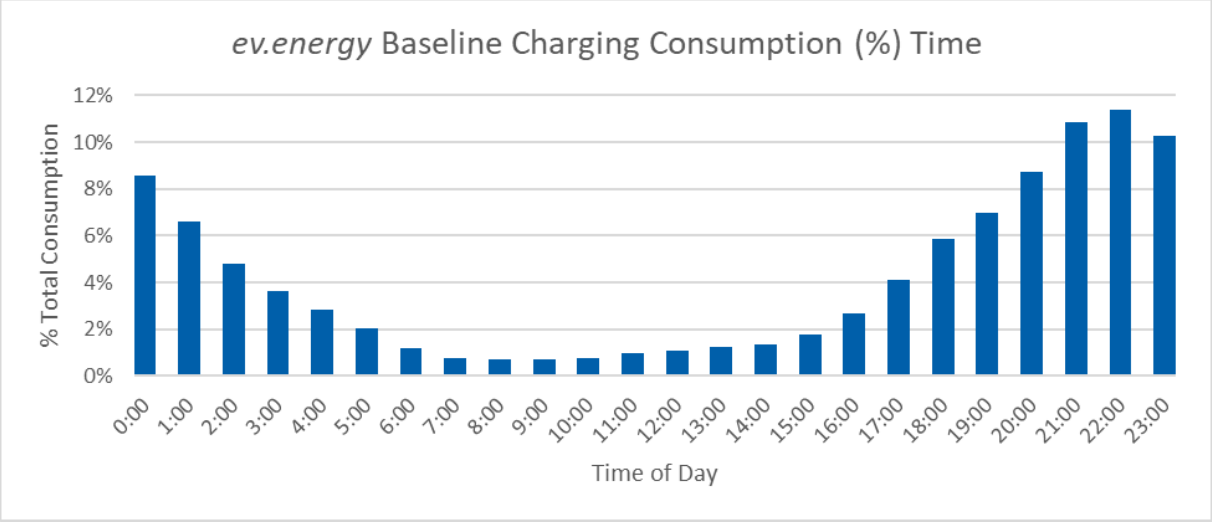


Figure 3 – *ev.energy* Plot Depicting the Time of Day When Drivers Plug-in their Vehicle, and Whether they are Home or Away

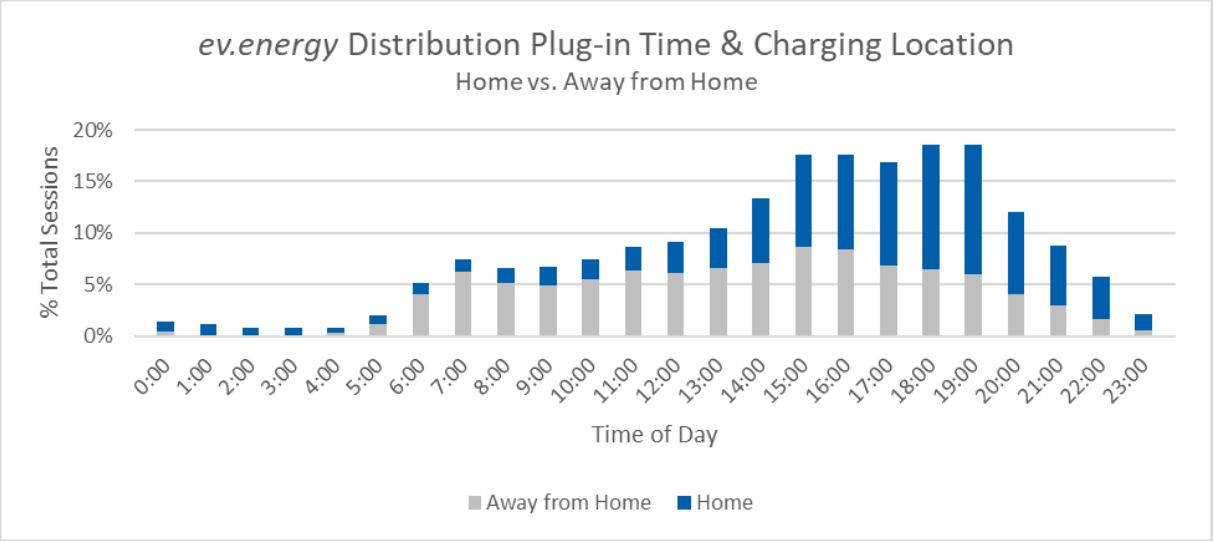
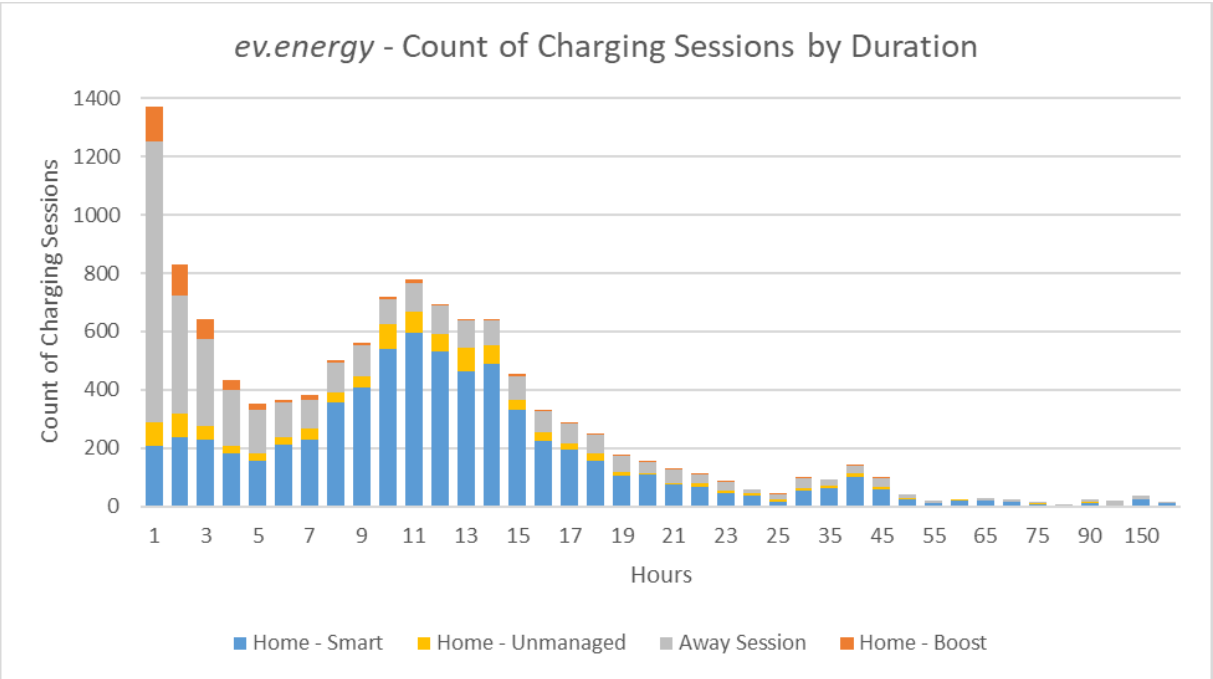


Figure 3 shows that the evening period between 15:00 to 19:00 is, as expected, when the majority of drivers plug-in, at home, where managed charging is available.

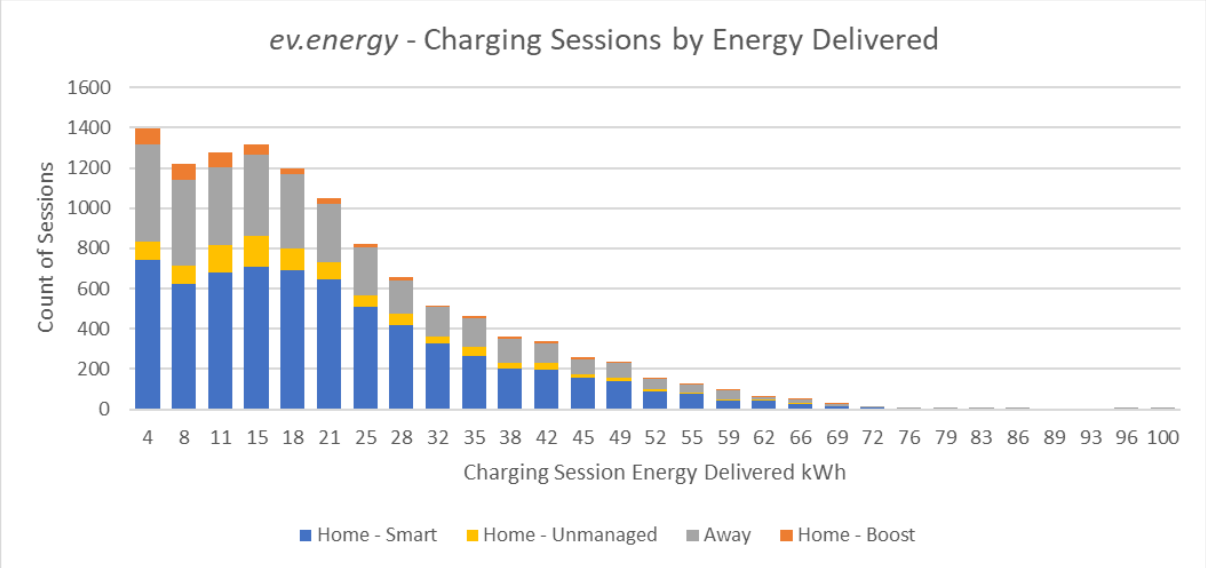
Figure 4 – *ev.energy* Plot Depicting the Duration of Charging Sessions



As shown in Figure 4, *ev.energy* vehicle telemetry charging data contains additional metrics that further describe charging session detail. This includes charging sessions away from home, unmanaged charging as well as 'boosted' charging, which is when the driver opts out of both demand response events and smart charging in order to receive energy to their vehicle immediately. It is observed that smart charging sessions

generally span longer charging session durations, typically 7 to 15 hours and, as shown in Figure 5, consume the majority of the energy delivered, both of which likely correlate to overnight charging sessions. Conversely, charging sessions away from home are most often of shorter durations. Figure 5 also shows that boosted charging, or opt-outs, are most often not high energy consumption events.

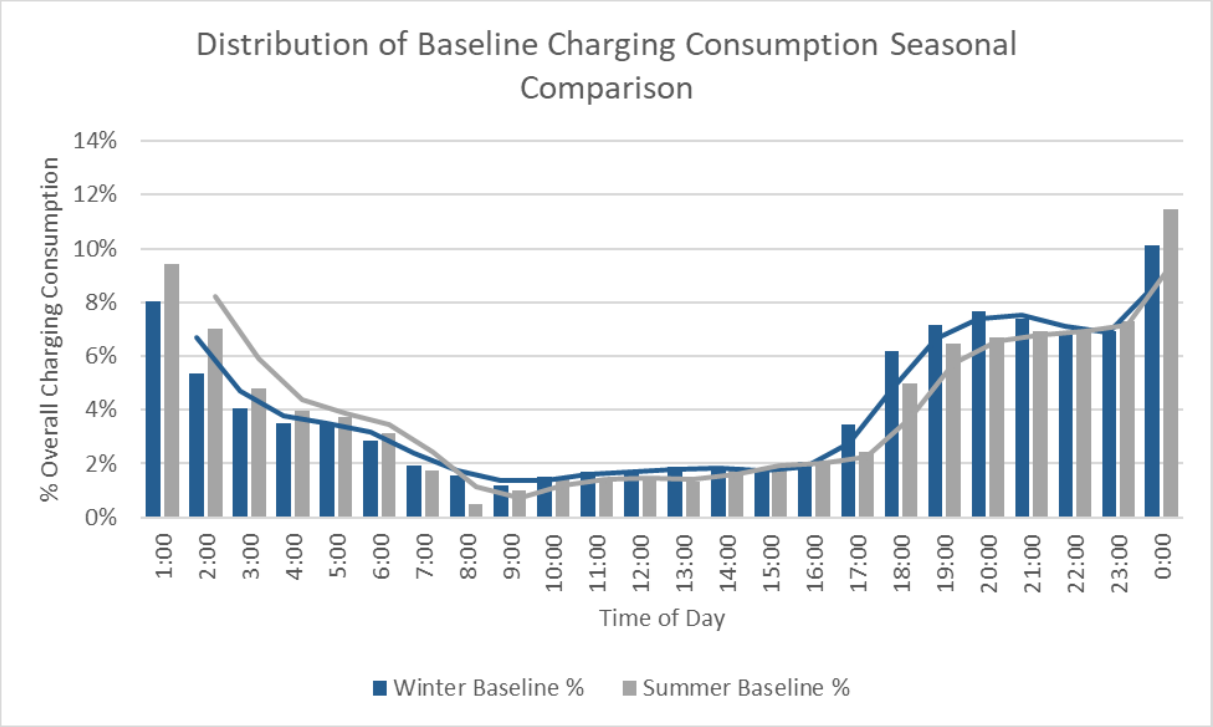
Figure 5 – *ev.energy* Plot Depicting Energy Consumed per Charging Session



BASELINE ENERGY CONSUMPTION BY SEASON

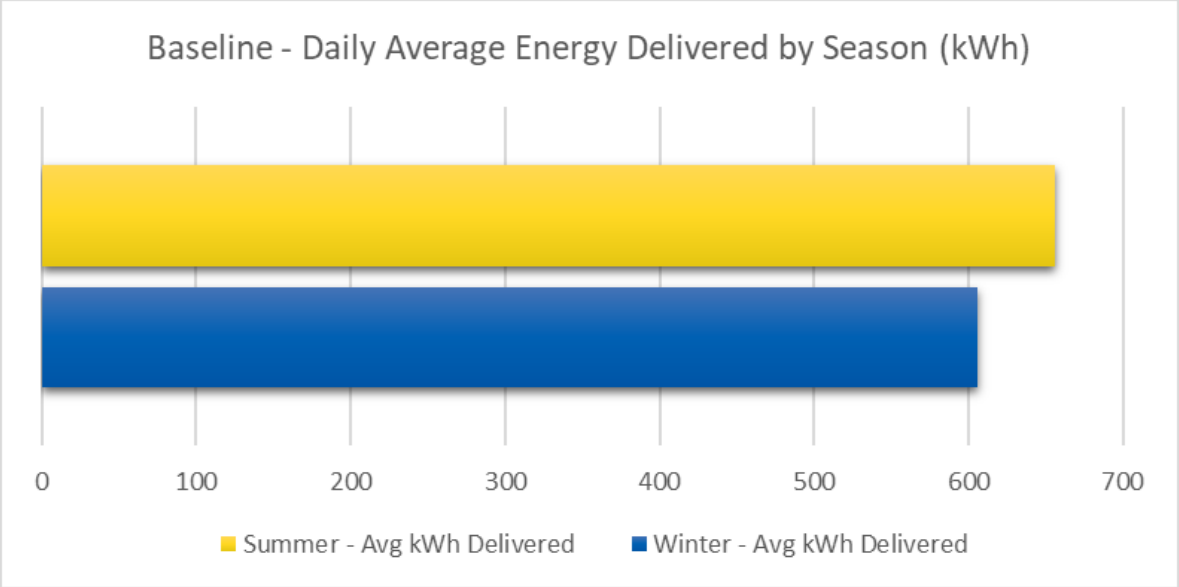
A comparison of seasonal baseline charging from ChargePoint devices was updated with additional data for the current reporting period, as shown in Figure 6. The same pattern of energy consumption being higher in the evening during the winter period, and higher in the overnight to morning period during the summer months, was observed as previously reported. However, a regression to the average between summer and winter has occurred. Understanding these types of patterns and metrics will support building an accurate business model where metrics can be applied seasonally.

Figure 6 – Average Baseline ChargePoint EV Consumption for Each Hour of the Day comparing Winter Months to Summer Months



As shown in Figure 7, analysis of the additional data from this period shows the average daily EV charging energy consumption continued to be higher during the summer compared to the winter months; this pattern continues to be unexpected. The initial hypothesis that battery system inefficiencies, brought on by the colder temperatures in winter, would result in higher energy requirements in the winter. This will continue to be monitored for analysis in future reporting.

Figure 7 – ChargePoint Daily Average Seasonal Energy Delivered

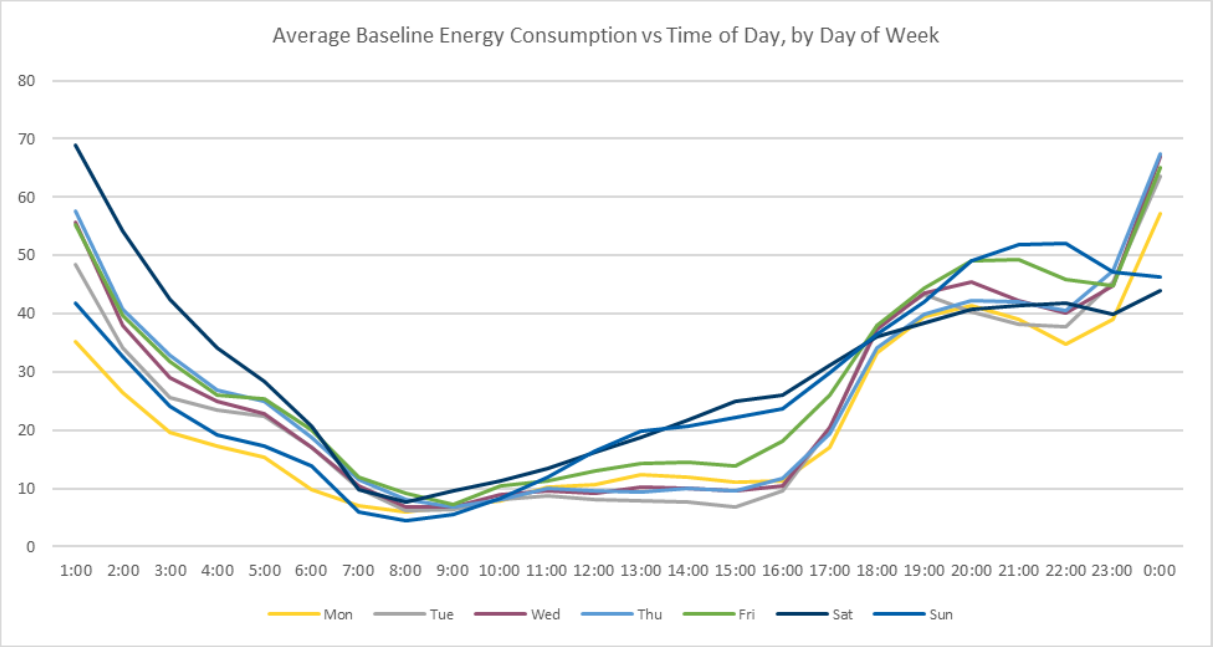


Seasonal data from *ev.energy* will be prepared for future reporting, as data is not sufficient at this time for analysis.

BASELINE ENERGY CONSUMPTION BY HOUR EACH DAY OF WEEK

Figure 8 shows the baseline consumption data by hour, broken out for each day of the week, for the period January 2021 to December 31, 2022. The results remain consistent with evaluation provided in the past two semi-annual reports, with the 23:00 peak occurring during the weekdays and not during the weekends.

Figure 8 – Average Baseline EV Consumption for Each Hour of the Day on Each Day of the Week



The 23:00 charging trend does not appear on Saturday and Sunday, possibly for two reasons:

- Evening charging between daily commutes is not required and/or the lack of assumed rate arbitrage beginning at 23:00 on weekends.
- The 23:00 peak, observed on weekdays, is not observed on weekend days as charging tends to follow a different pattern in the mid-day through evening period. This may be a combination of several factors:
  - naturally occurring charging behaviour;
  - behaviour driven by time-of-use (TOU) rates (which includes 11 customers within the pilot); and/or
  - behaviour influenced by perception of a benefit, whether perpetuated by others, news articles, or – as previously reported – by the default language in the ChargePoint app that customers use, that suggests all customers are eligible to save from off-peak rates, as shown in **Attachment 5** – SGNS Project Lessons Learned.

PEAK EV CHARGER DEMAND

Understanding peak EV charger demand from the fleet of chargers under study in the project provides insight to the capability of a broader program of managed chargers to provide demand response.

After full enrollment was achieved, the number of chargers available at any point in time continues to fluctuate based primarily on connectivity and driver availability. To date, the peak charging observed is 171.1 kW at the 23:15 interval on March 1, 2022, with 45 vehicles charging of the 93 available chargers enrolled to the program at the time, as shown in Figure 9. This is currently the maximum actual power available to curtail that has been observed, given the ideal scenario. The absolute maximum coincidental peak charging level for the SGNS program with the current configuration of installed capacity of chargers would be 984 kW, which means that the peak observed to-date would be approximately 17% of total installed capacity. It is also worth noting that some vehicles have a limitation on charging power and the actual installed capacity within the program is lower.

In the current reporting period, the peak observed is shown in Figure 10,145.8 kW at 00:15 on December 10, with 37 drivers charging of 87 of the available chargers. This did not surpass the peak from the previous period, as noted above and in the July 2022 report.

Figure 9 – Screen Capture of the Peak Demand (171.1 kW) seen by ChargePoint EV Charging Fleet, to Date

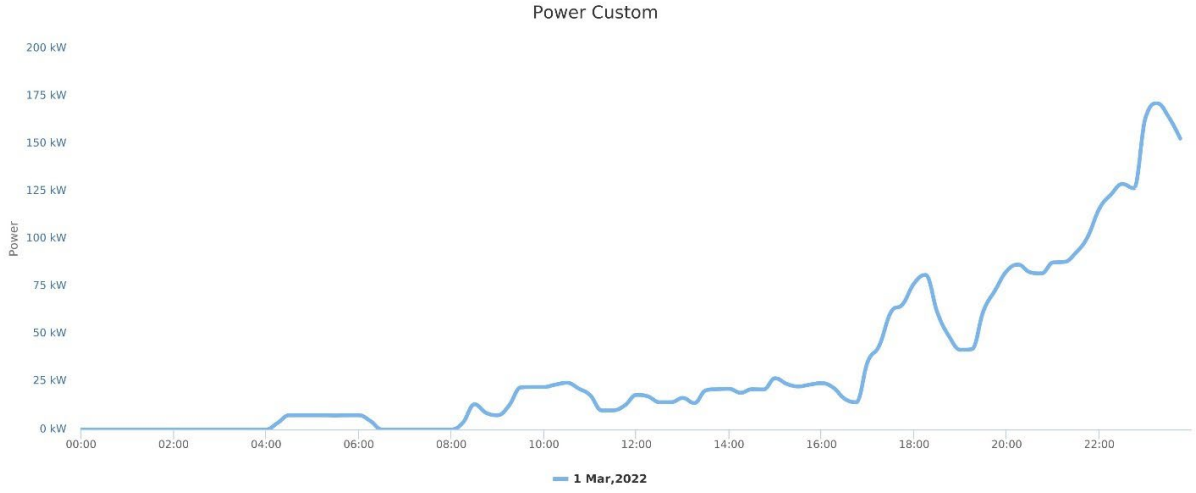
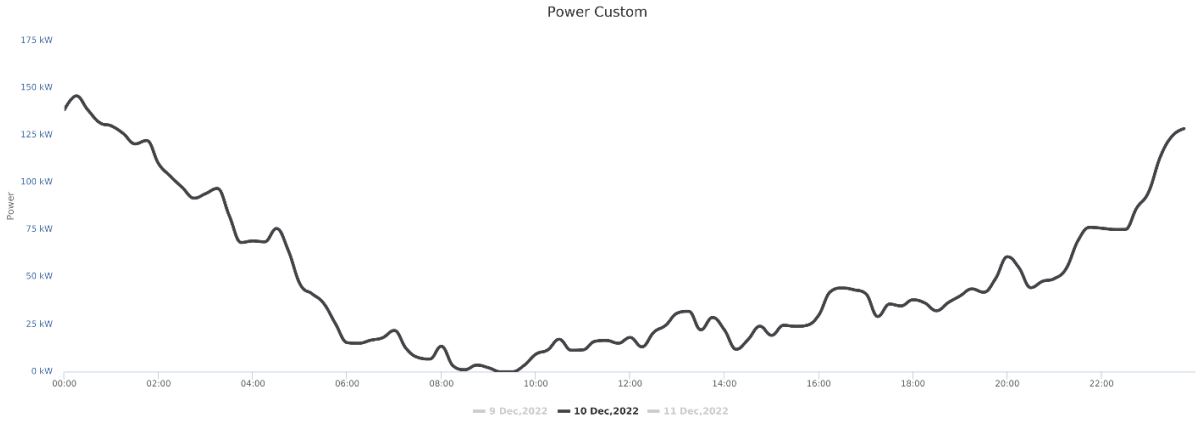
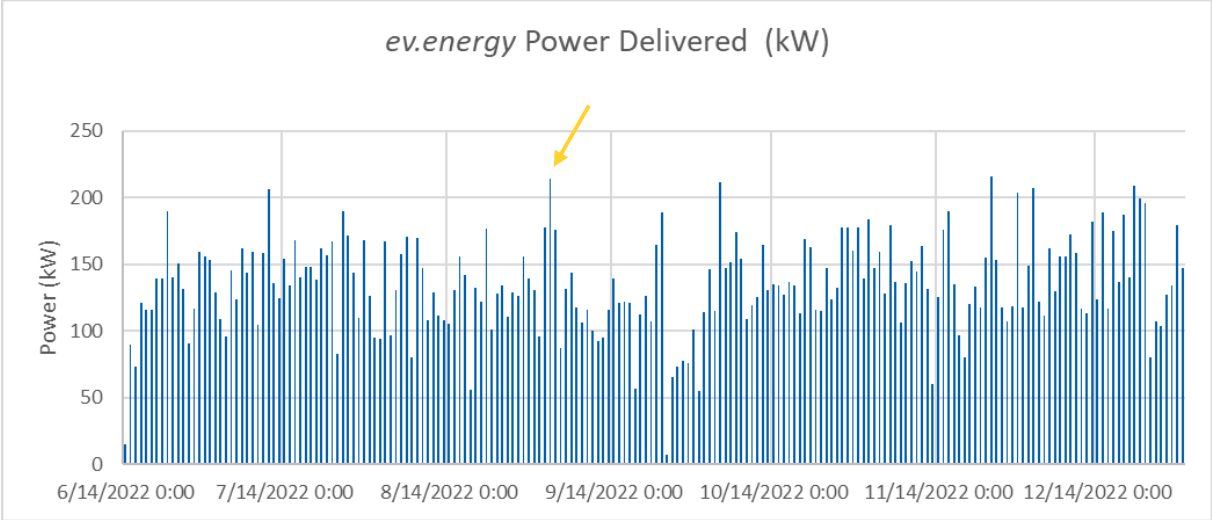


Figure 10 – Screen Capture of the Current Reporting Period Peak Demand (145.81 kW) seen by ChargePoint EV Charging Fleet, December 10, 2022 at 00:15



As depicted in Figure 11, the 30-minute interval of peak energy delivered was September 2, 2022 at 05:00. The average power delivered in this 30-minute interval is calculated as 214.26 kW, while 48 vehicles were in an active session. This peak occurred at 05:00, which is likely a result of the *ev.energy* algorithm shifting 'smart' charging participants to the morning period – closer to the driver's chosen 'ready by' time, as discussed in Section 3.1.2. Because of this, this peak would be considered influenced charging.

Figure 11 – *ev.energy* Plot of Energy Delivered during Period of June 14 to December 31, 2022



3.1.2. TESTING

All test events, below, included a group of 1 to 61 ChargePoint chargers. Events started with the first available charger on January 25, 2021 and continued as chargers were available to be added, with up to 61 involved by December 31, 2021. A larger testing group was planned; however, the charge control issue

with Tesla vehicles[2] – which comprise 40 of the total 101 participating vehicles – prevent them from being included in most of the tests. Note the total number of available chargers fluctuates based on defective units being replaced, customers changing within the program, and reliability of home Wi-Fi. The number of chargers receiving events has averaged around 56 devices of 61 chargers not associated with a Tesla vehicle over this reporting period, as several chargers have required replacements due to manufacturer issues.

As noted in this report and the July 2022 report, NS Power launched more EV smart charging testing using the *ev.energy* EV platform, welcoming additional customers, and moving existing Tesla drivers over from the ChargePoint program. Testing on *ev.energy* included the entire registered fleet. The number of vehicles receiving events fluctuated with user acquisition growth, which totaled 108 vehicles at the end of the reporting period.

Figure 12 and Table 1 summarize all ChargePoint events run since the beginning of testing, in 2021. Table 2 summarizes events sent to *ev.energy* customers. The majority were for the EVSE3 time-varying curtailment use case, in which chargers were curtailed to 25% or 50% of their nominal charging capacity between the hours of 17:00 and 19:00.

- The 'Received Event Ratio' depicts the ratio of charging stations that participated in the event, versus the number of stations that received the event. The gap between the two is due to technical configuration changes or defects that limited the availability of chargers to participate in events and this number continues to increase this period as defects have been resolved within the integration and testing.
- 'Estimated Average Shed per Event per Opt-in (kW)' is the average reduction in charge power observed for an event across all participating chargers. This metric may be useful to predict the kW shed value for large scale programs and will inform the business model to be presented with future reporting. This value has remained generally constant throughout this and previous reporting periods.
- 'Estimated Average Shed per Event per Opt-in and Charged (kW)' is also added to the table and may suggest the average curtailment opportunity that a level 2 charger provides during periods where a vehicle is actively charging. Assuming a high opt-in ratio, as has been observed so far, these figures would remain relatively unchanged for all chargers that are participating in a smart charging program and receiving an event.

[2] Detailed in the July 2021 Semi-Annual Report.

Figure 12 – Figure indicating ChargePoint Event Counts versus Event Start Time

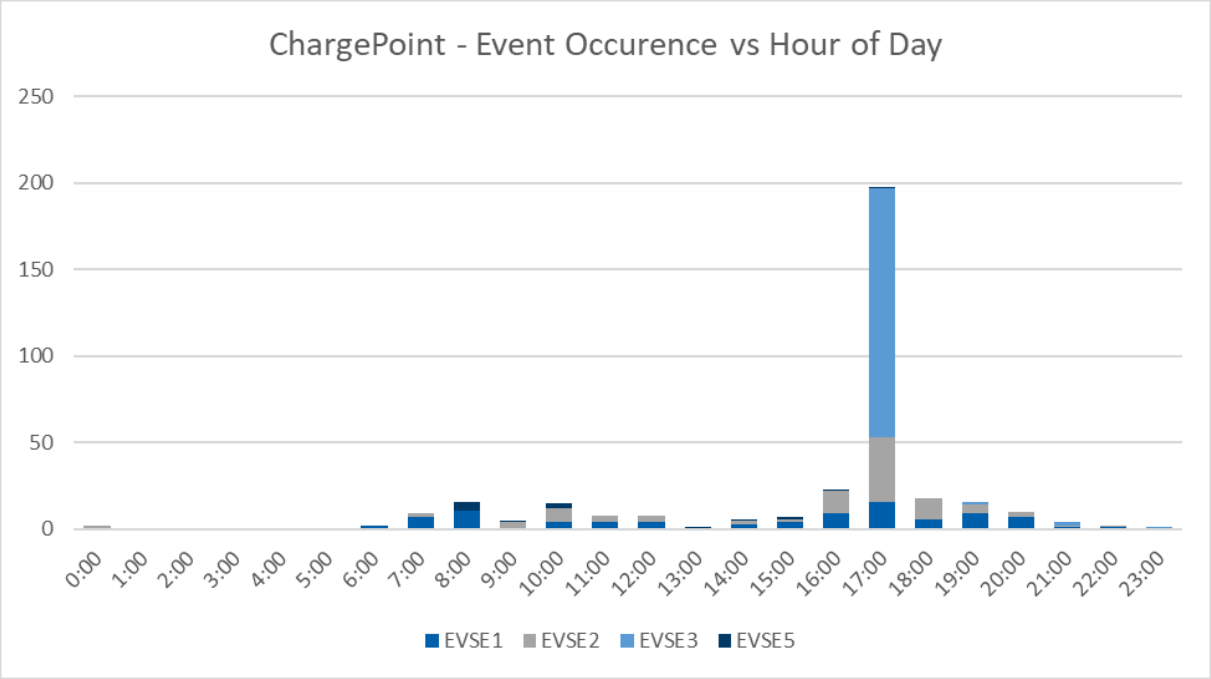


Table 1 – Summary of Events Dispatched to ChargePoint EV Chargers since January 2021

	EVSE Use-Case Summary (January 1, 2021 - December 31, 2022)				
	EVSE1	EVSE2	EVSE3	EVSE5	All
First Event Date	5/19/2021	5/25/2021	1/25/2021	7/13/2021	1/25/2021
Period End Date	12/22/2022	12/22/2022	12/22/2022	12/22/2022	12/22/2022
Number of Events	88	100	149	14	351
Expected Event Participation (Chargers)	4618	5372	5734	791	16515
Received Event Notification (Chargers)	3991	4698	4588	598	13875
Received Event Ratio	86%	87%	80%	76%	84%
Opt-Ins	3976	4678	4570	596	13820
Opted in and Charging during event	698	834	966	87	2585
Opted in and Not Charging during event	3269	3830	3598	507	11204
Opt-Outs	15	20	18	2	55
Opted out and Charging during event	2	2	2	0	6
Opted out and Not Charging during event	13	18	16	2	49
Opt in Ratio	99.62%	99.57%	99.61%	99.67%	99.60%
Estimated Average Shed per Event (kW)	45	47	33	36	40
Estimated Average Shed per Event per Opt-in (kW)	0.99	0.97	1.04	0.83	1.00
Estimated Average Shed per Event per Opt-in and Charged (kW)	5.3	5.2	4.0	5.4	4.7

Table 2 – Summary of Events Dispatched to ev.energy Customers, July 1 to December 31, 2022

	EVSE Use-Case Summary (July 1, 2022 - December 30, 2022)			
	EVSE1	EVSE2	EVSE3	All
First Event Date	8/30/2022	8/26/2022	7/12/2022	1/25/2021
Period End Date	11/14/2022	11/14/2022	11/14/2022	6/30/2022
Number of Events	9	7	49	65
Opted in and Charging during event	178	138	875	1191
Chargers Available	857	718	4510	6085
Opt-Outs	16	12	32	60
Average % Shed per Event	33.49%	68.73%	80.41%	72.66%
Estimated Average Shed per Event (kWh)	48.16	53.54	52.63	52.11
Estimated Average Shed per Event per Opt-in (kW)	1.01	1.14	1.46	1.36

Based on the data to-date, shown in Figure 13, the highest available power for shedding (curtailing of charge) occurs at the 23:00 interval followed by the 07:00 interval, which is consistent with the previous report although the overall distribution has been somewhat levelized, in part due to more data across each hour of the 24-hour period. It is suspected that the higher shed values at these hours may be outliers, due to the small sample sizes of events dispatched to date for these hours. This data is only currently available for hours in which events were scheduled and this leaves a gap during early morning hours. This will be improved through additional events across all 24 hours as additional use cases are executed, and further analysis is completed in future reports.

As use case testing progresses, more confidence in hourly shed potential is expected, and can then be applied to the Financial Model (Attachment C of the Compliance Filing[3]). This will evaluate the shed values with hourly system cost figures (e.g. marginal cost) to determine the value of each kW (or kWh) of shed to NS Power for a specific hour or two-hour period.

[3] Reference M09519 – Smart Grid Nova Scotia Project Application – Compliance Filing (24 Jul 2020) Appendix C

Figure 13 – Power Shed Opportunity versus Event Start Time

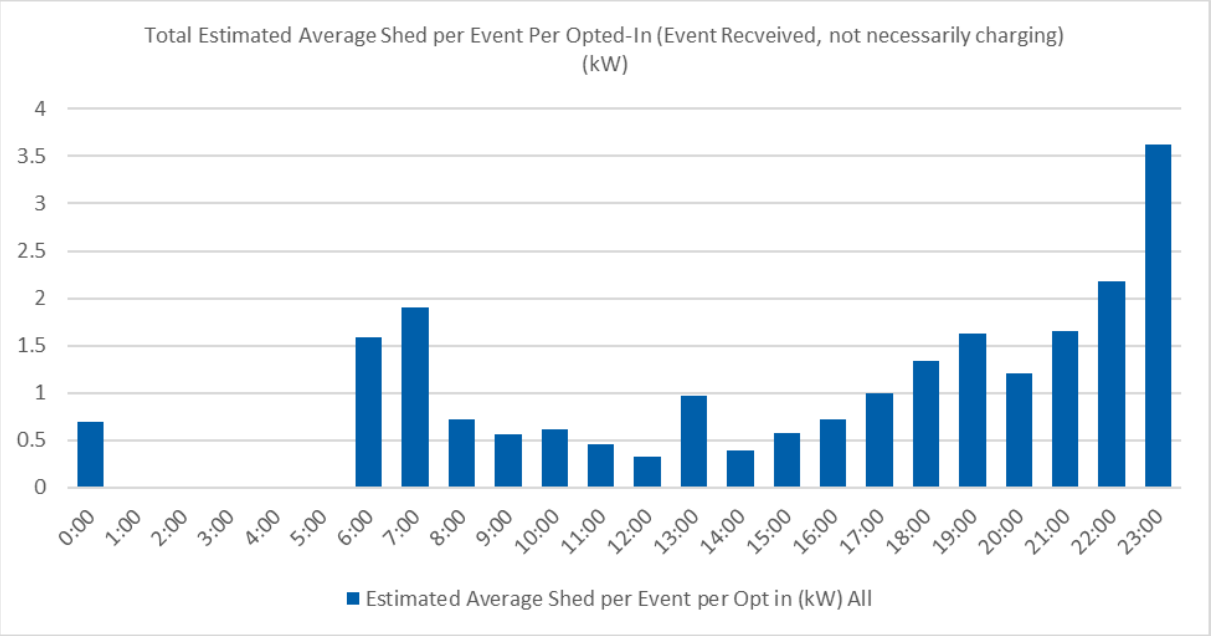
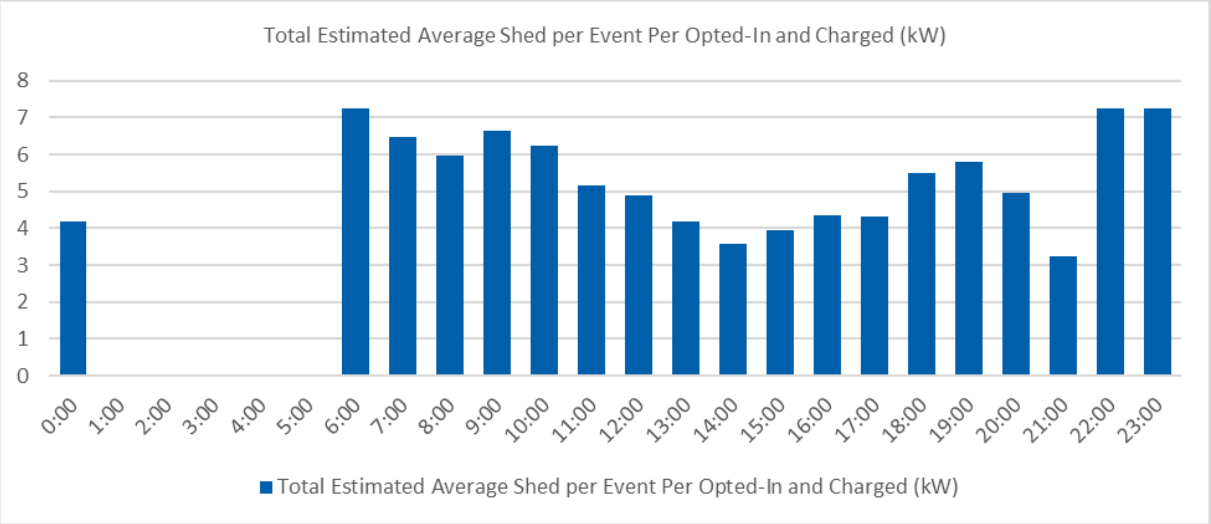


Figure 14 also shows a similar calculation of shed values, considering only data where vehicles were charging during events. This metric can support future analysis considering the average curtailment opportunity that a level 2 charger provides during periods where a vehicle is actively charging.

Figure 14 – Power Shed Opportunity of Vehicles that are Actively Charging versus Event Start Time



EVSE1 – LOAD LEVELING, DAY AHEAD GENERATION PLANNING

Introduced for ChargePoint on May 19, 2021. Curtailed to 25% of nominal or 50% of nominal charge. Estimated Shed per Event per Opt-In (kW) across all executed events in the ChargePoint fleet is currently 0.99 kW as shown in Table 1.

ev.energy EVSE1 use case testing was introduced on August 29, 2022 and curtails charging to 0% during an event. Estimated Shed per Event per Opt-In (kW) across all executed events in the *ev.energy* fleet is currently 1.01 kW as shown in Table 2.

This use case is based on economic dispatch and analysis will be completed in conjunction with the business model presented in future reporting. The use case will continue to be included in the schedule for execution.

EVSE2 – LOAD LEVELING, INTRA-DAY GENERATION PLANNING

Introduced for ChargePoint on May 25, 2021. Intra-day Economic Dispatch: curtailed to 25% of nominal or 50% of nominal charge. Estimated Shed per Event per Opt-In (kW) across all executed events in the ChargePoint fleet is currently 0.97 kW as shown in Table 1.

ev.energy EVSE2 use case testing was introduced on August 26, 2022, and curtails charging to 0% during an event. Estimated Shed per Event per Opt-In (kW) across all executed events in the *ev.energy* fleet is currently 1.14 kW as shown in Table 2.

This use case is based on economic dispatch and analysis will be completed in conjunction with the business model presented in future reporting. The use case will continue to be included in the schedule for execution.

EVSE3 – LOAD LEVELING, TIME-VARYING CURTAILMENT

Modified Time-Varying Curtailment (17:00 to 19:00 window only). Introduced for ChargePoint on January 25, 2021. Curtailed to 25% of nominal or 50% of nominal charge. 100% of nominal and 0% of nominal used in early use-case testing with smaller groups to prove functionality. The subsequent stage of testing will include a scheduler within ESP that will follow the NS Power residential TOU rate structure (i.e. rate 06B) and automatically execute curtailment events during on-peak hours.

ev.energy EVSE3-modified use case testing was introduced on July 11, 2022 where 17:00 to 19:00 window demand response events were dispatched, curtailing to 0% of nominal during an event.

ChargePoint Results

Figure 15 depicts the technical capability to curtail EV charging load during the Nova Scotia grid peak, between 17:00 and 19:00, by curtailing electric vehicle supply equipment (EVSE).

Figure 15 – ChargePoint Dashboard Depicting a 25% Curtailment Event from 15:00 to 17:00

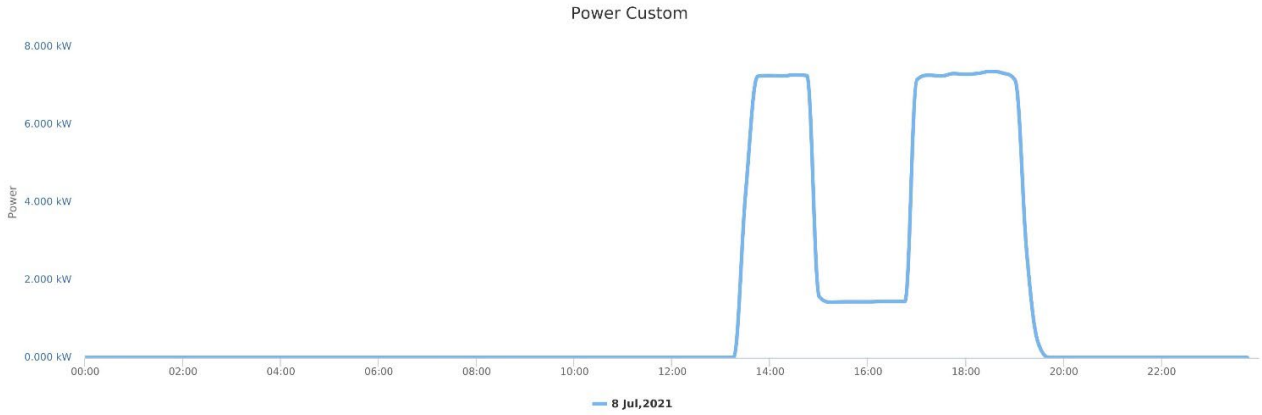
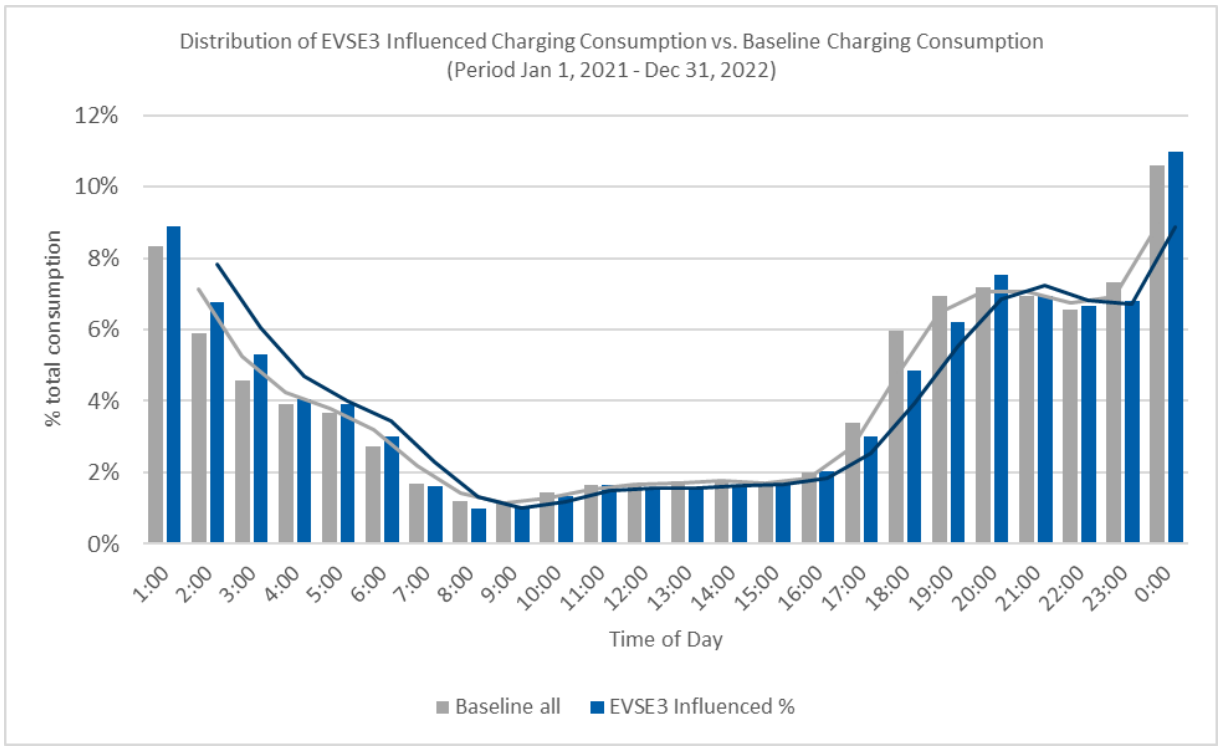


Figure 16 – EVSE3 Event Results



The EVSE3 use case data captured to date, as shown in Figure 16, suggests that there is an opportunity to shift EV charging peak away from the Nova Scotia grid peak to alleviate potential EV peak time charging impacts to the system, which NS Power will continue to test and evaluate.

The peak charging power found during the typical Nova Scotia grid peak hours for the managed charging fleet was found to be 132.3 kW at 19:00 on February 27, 2022, with 31 chargers connected at the time shown in Figure 17. This peak is aligned to the end of an EVSE3 17:00 to 19:00 curtailment event, where

charging power is ramping back up and, although this suggests a successful peak shifting event, it is worth noting that other peaks can be created due to curtailment events.

In the current reporting period, the peak observed during the Nova Scotia grid peak hours, between 17:00 and 19:00, was 121.6 kW at 18:00 on September 23, 2022, as depicted in Figure 18. This did not surpass the peak from the previous reporting period, as noted above and in the July 2022 report.

The 132.3 kW peak, described above, which occurred during the Nova Scotia grid peak hours, represents 13.4% of the maximum installed charger capacity of 984 kW. This also indicates that the expected maximum 17:00 to 19:00 peak is 77.3% of the maximum observed peak of 171.1 kW in Figure 9, which, as previously mentioned, could be influenced by other factors, including messaging within the ChargePoint app.

Figure 17 – Screen Capture of the Peak Demand seen by ChargePoint EV Charging Fleet During the 17:00 to 19:00 Period, to Date

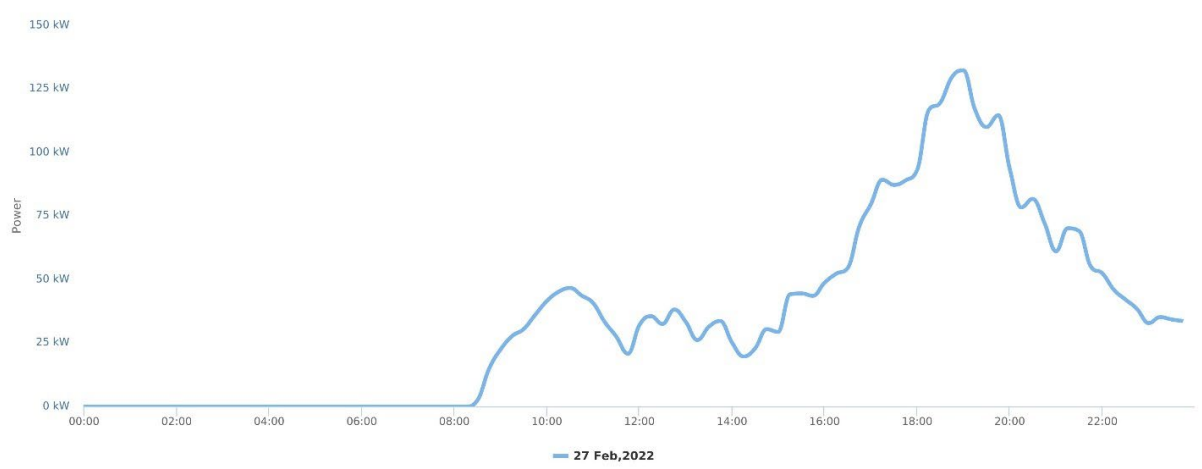


Figure 18 – Screen Capture of the Peak Demand seen by ChargePoint EV Charging Fleet During the 17:00 to 19:00 Period, Between July 1 and December 31, 2022

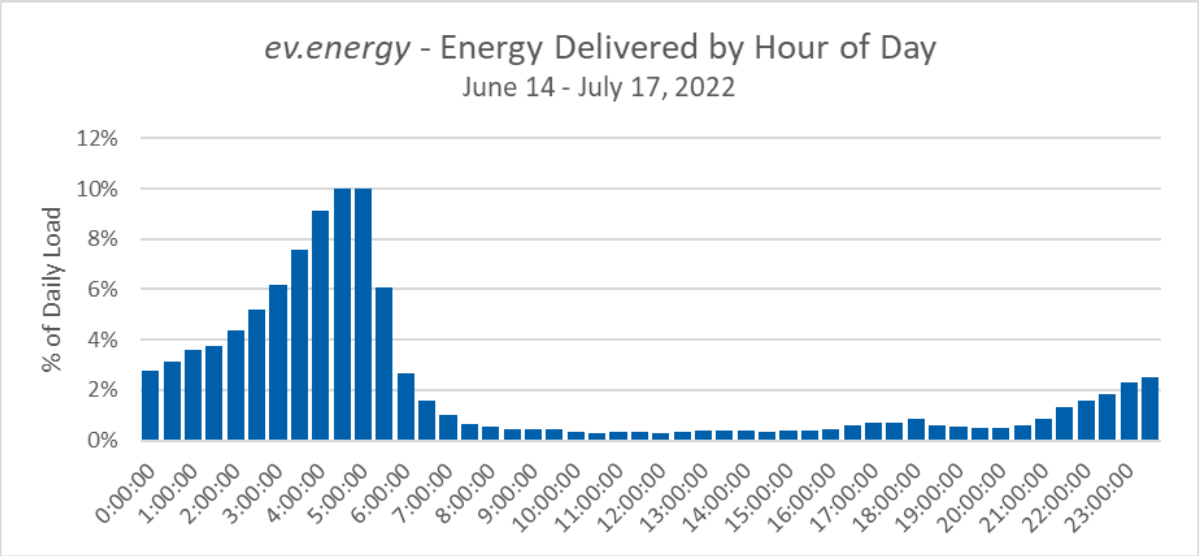


Estimated Shed per Event per Opt-In (kW) across all executed events in the ChargePoint fleet is currently 1.04 kW as shown in Table 1. This testing will continue through 2023 and results will be presented as part of future reporting.

ev.energy Results

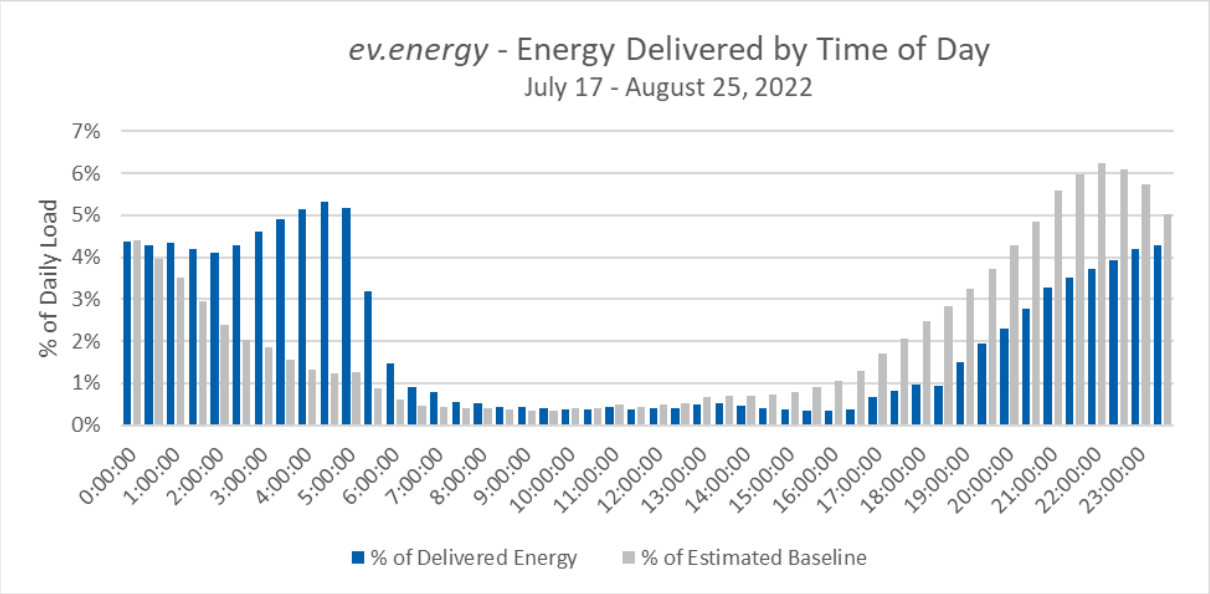
The *ev.energy* scheduling algorithm prioritizes fully charged vehicles by an in-app, user-defined 'ready by' time. This functionality automatically shifts charging, based on tariff and 'ready by' time to the overnight period and closer to the 'ready by' time. As shown in Figure 19, this algorithm created a new, unintended, morning peak at approximately 05:00.

Figure 19 – Actual Energy Delivered to Customers using *ev.energy*, June 14 to July 17, Before Any Use Case Events were Issued



By iterating on the experiment, *ev.energy* was able to adjust the scheduling algorithm by introducing another 'proxy' price signal, smoothing the overnight charging as to not create as significant a new morning peak just before popular 'ready by' times, as shown in Figure 20.

Figure 20 – Actual Energy Delivered, July 17 and August 25, during EVSE3 Testing



Along with the *ev.energy* smart charging, the data in Figure 20 also includes 27 demand response events scheduled for the 17:00 to 19:00 period. The *ev.energy* estimated baseline (counterfactual) calculation indicates that the total uninfluenced energy delivered in the 17:00 to 19:00 time period July 17 to August 25, 2022 would have been 2.74 MWh, while the actual energy delivered was 1.04 MWh. This initial review equates to 62% shift in energy that could be delivered outside of the NS Power 2-hour system peak.

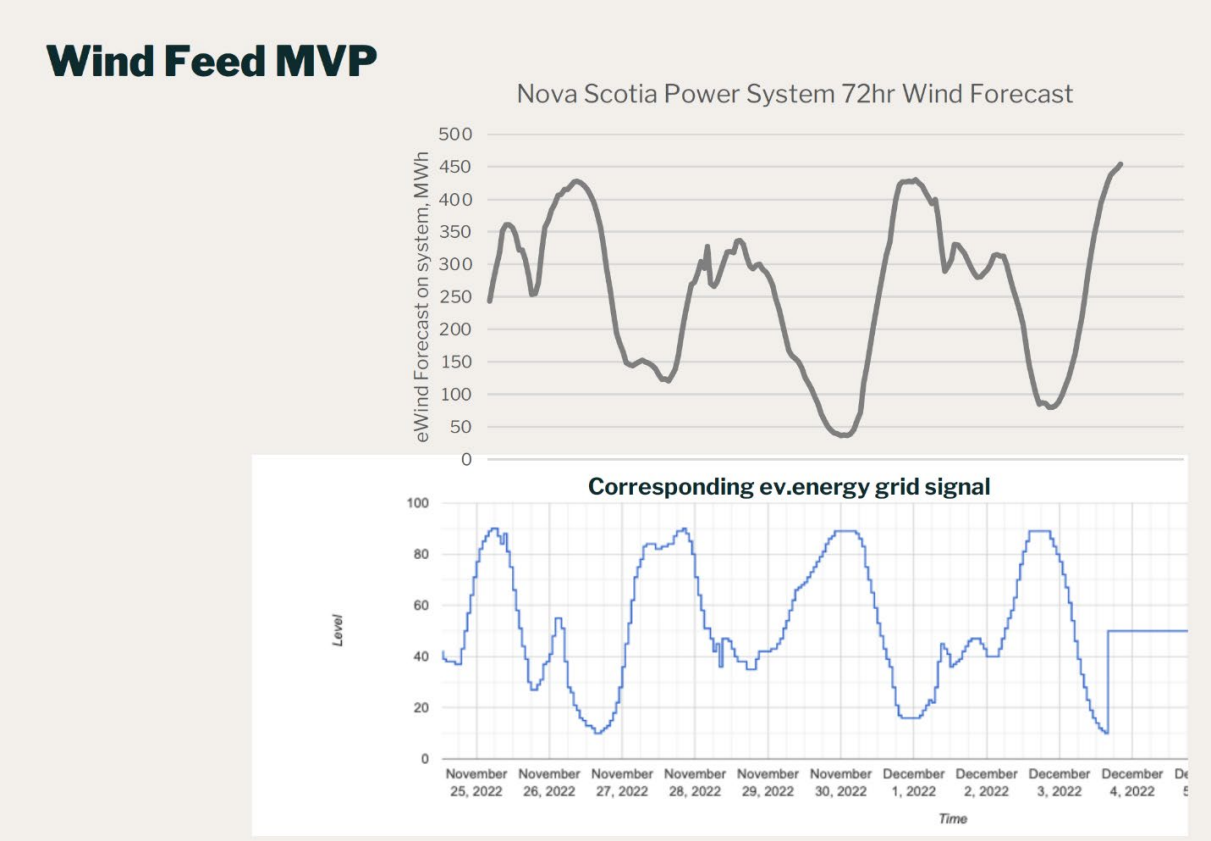
Estimated Shed per Event per Opt-In (kW) across all executed events in the *ev.energy* fleet is currently 1.01 kW as shown in Table 2. This testing will continue through 2023 and results will be presented as part of future reporting.

EVSE4 – INTERMITTENT RENEWABLE GENERATION FOLLOWING

ESP functionality for this use case with ChargePoint EVSE was delivered in the current reporting period; however, defects were found during testing that precluded use case execution to date for the ChargePoint integration. The NS Power PI system integration was completed. It is expected that defects will be resolved early in Q1 2023 and use cases will be executed throughout Q1/Q2 2023 and analysis will be available in future reporting.

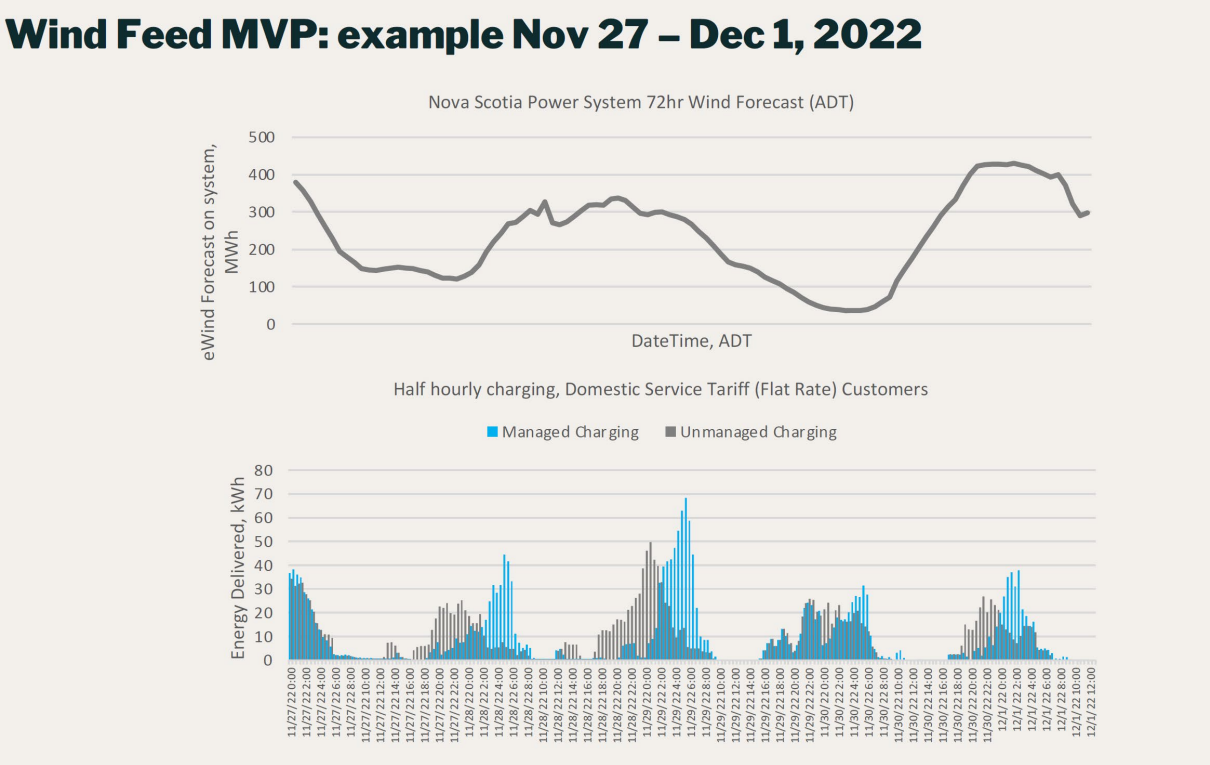
The *ev.energy* use case testing was expanded to include a modified Intermittent Renewable Generation Following use case, whereby a 72-hour wind generation forecast would be delivered to *ev.energy* partners on Mondays, Wednesdays, and Fridays. As depicted in Figure 21, a grid signal inverse to the wind forecast was generated and applied to the scheduling algorithm as a 'proxy' price signal that would attempt to shift charging to times when wind generation was forecast to be high, and to curtail charging (to zero) when wind generation was forecasted to be low.

Figure 21 – NS Power 72-hour Wind Forecast and Corresponding *ev.energy* Grid Signal



In the initial test, or minimum viable product (MVP), the signal was 'relative,' meaning that it set the maximum forecast wind generation near level 0 ('cheapest') and the minimum forecast wind generation near level 100 ('most expensive'). This would be true whether the variance to forecast was 400 MWh or 5 MWh.

Figure 22 – Early Example Results from the *ev.energy* Wind Following Use Case, for the period November 27 to December 1, 2022



Early results shown in Figure 22 are inconclusive. While the 'Managed Charging' is shifted from the 'Unmanaged Charging' and appears correlated to the shape of the forecast, the scheduling algorithm is also prioritizing the 'ready by' time selected by the individual drivers. Especially on November 28, 29, and 30, it is difficult to positively correlate the results to the specific action. This concept, and how the relative signal change influences the charging will be explored further as this use case testing is ongoing.

In addition to further data collection and analysis there are at least two planned iterations. First, changing the relative wind signal to an absolute signal, where the cheapest proxy signal is equivalent to the maximum wind generation capacity on the system and the most expensive is a forecast of 0 MWh. The other iteration is attempting to square the wind signal so that it is delivered in steps, instead of ramping, to better approximate an on/off scenario.

If correlated wind following is established, then DR events will be introduced on top of the case to examine a value-stacking effect. Further analysis will be provided in future reporting.

EVSE5 – GENERATION CONTINGENCY (10-MINUTE OPERATING RESERVE)

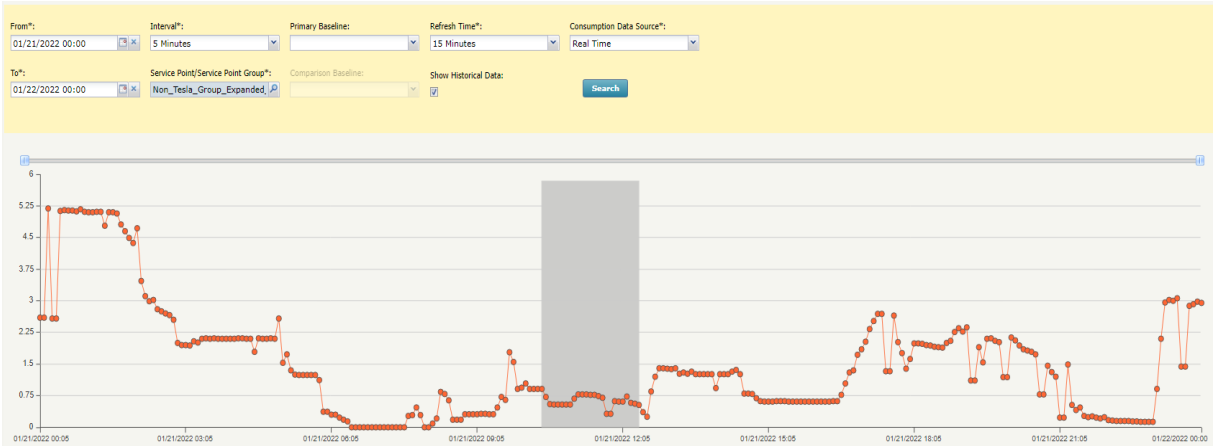
Introduced on the ChargePoint fleet on January 25, 2021 as a prioritized 'stand-by' use case (that cannot be scheduled but is run when the condition is present). Curtailed to 25% of nominal charge based on NS Power Large Interruptible Industrial rate advisory being issued. When available, EVSE5 takes priority over all other use-cases, though only one two-hour event can run each day.

The ability to respond to 10-minute operating reserve generation contingency events was proven technically successful. As the capability of 'Reserve Call' through the pool dispatch functionality matures within ESP, it will be a valuable automated tool for this use case and observations and analysis will be included in future reporting. As shown in Table 1, the Estimated Average Shed per Event (kW) is lower for this use case (currently 0.83 kW), as there are generally fewer vehicles charging during the contingency occurrences to-date.

EVSE5 events were dispatched to ChargePoint on the following dates: 7/13/2021, 8/25/2021, 8/26/2021, 8/31/2021, 11/2/2021, 11/5/2021, 11/17/2021, 11/18/2021, 12/08/2021, 1/12/2022, 1/21/2022, 1/27/2022, and 3/9/2022.

Additional Generation Contingency alerts were received during this reporting period on the following dates and EVSE5 events were executed: 8/9/2022, and 11/15/2022. Figure 23 depicts the 1/21/2022 Generation Contingency event to 50% charging power. Future testing plans will include curtailing any active chargers to 0 kW during a contingency event.

Figure 23 – Screen Capture from ESP Depicting an EVSE5 Event Dispatched on January 21, 2022



During the interval in gray shading, all active chargers were set to charge at 25% of the maximum energy in response to a 10-minute operating reserve event. The y axis indicates kWh.

An automated method of executing this use case based on generation system reserve levels is currently in design with the ESP development team for use with the ChargePoint fleet.

EVSE5 is also available to execute with the *ev.energy* system. Although, since the *ev.energy* system recommends one to two 30-minute interval polls to ensure a significant number of vehicles receive the grid signal and event, there are expected to be some limitations to the success of this use case. The capacity available on an ad-hoc basis may also conflict with the smart charging scheduler. No EVSE5 events have been scheduled with *ev.energy* to date; this will be further evaluated over the next reporting period.

EVSE6 – COLD LOAD PICKUP RELIEF

A revision of the configuration of this use case design was undertaken during the current reporting period, whereby the use case will no longer be triggered by an ESP Operator monitoring outages for an opportunity to manually execute a test. Instead, ESP will automatically monitor feeder PI data and trigger when ESP indicates a feeder has experienced an outage. This use case will be executed through the winter (Q1 2023), when this use case is most prevalent, and reporting will be included in future reporting.

ev.energy will not have the capability to issue automatic triggering events to reduce the effects of cold load pickup. Also, as discussed above, since the *ev.energy* system recommends one to two 30-minute interval polls to ensure a significant number of vehicles receive the grid signal and event, it is not contemplated that operators will use this platform to issue manual commands. This will be further evaluated in the first half of 2023.

EVSE7 – DISTRIBUTION CONGESTION MANAGEMENT

The ESP functionality for this use case was delivered in the current reporting period; however, defects were found during testing that precluded execution of this use case to date for the ChargePoint integration. The NS Power PI system integration was completed. It is expected that defects will be resolved in Q1 2023, and use cases executed throughout Q1 and Q2 2023 with analysis to follow in future reporting.

ev.energy will not have an integration to real time PI data for distribution congestion management and any real cluster of participants is by chance. It is contemplated that this use case will be modelled using real charging data from ev.energy that is aggregated to resemble an empirical cluster and real historical feeder data from real congested feeders measured in our normal course of business. This will not produce empirical evidence for this use case but demonstrate the theoretical opportunity to build such functionality should it prove to be useful. Further consideration and analysis will be presented in future reporting.

3.1.3. CUSTOMER EXPERIENCE OBSERVATIONS

ChargePoint

NS Power issued a customer survey to obtain additional insights from ChargePoint participants throughout the pilot period. Customer feedback included the following key insights.

- Customers were most motivated to enroll in the program for cost-savings (80% of customers) and positive environmental impacts (78% of customers).
- 86% of project participants affirmed their vehicle was always charged when needed.
- 98% of project participants affirmed the program did not cause disruptions to their normal routine or adversely affect their driving habits or home-life.
- 95% of project participants would participate in a managed charging program if offered by NS Power in the future.

ev.energy

NS Power will issue a customer survey to *ev.energy* project participants in 2023. Customer feedback data will be included in the final SGNS report.

3.2. BI-DIRECTIONAL CHARGING

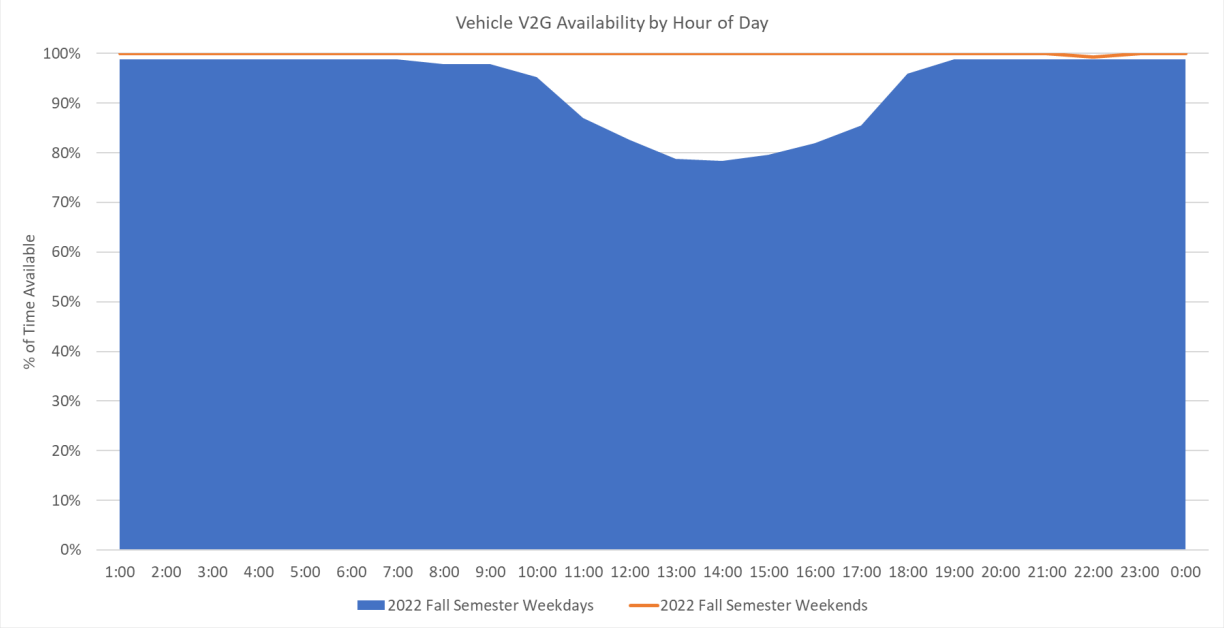
3.2.1. OBSERVATIONS

AVAILABILITY

In both residential and commercial settings, the timing and duration that the EV is available (i.e. plugged into the bi-directional charger and not in-use) must be considered when determining the load capacity that is available for various use cases. For instance, if the facility peak demand period coincides with the period in which the EV is not plugged in for charging, there will be limited load capacity for testing the demand charge management use case – due to vehicle availability. Understanding of this type of availability metric is be important to the success of pilot testing, as well as future programs.

Faculty at the Nova Scotia Community College (NSCC) Annapolis Valley Campus drive the Nissan Leaf that has been provided for V2G testing with the Coritech bi-directional charger. When used for transportation, the Leaf is primarily used for travel between NSCC campuses, during which time the Leaf is disconnected and unavailable for use case testing. Figure 24 shows the average Leaf availability for the Coritech charger during the fall 2022 semester (September 1 to December 31) on weekdays and weekends. This data demonstrates that the Leaf is typically available for bi-directional charging outside of general working hours, with highest transportation usage occurring during the middle of the workday.

Figure 24 – Summary of EV Availability (Connected to the Coritech Bi-directional Charger) during Fall 2022 Semester



For example, the Leaf at NSCC typically provides flexible bi-directional load capacity during Nova Scotia grid evening peak times; however, lower availability during working hours may limit the flexible bi-directional load capacity available for Nova Scotia grid morning peak reduction, generation contingency events during working hours, or facility demand management.

Prior to the start of remote testing, in August 2022, NSCC faculty were not plugging the Leaf into the Coritech charger when the vehicle was not in-use and, therefore, the average availability was lower during weekdays in 2022 overall versus the fall 2022 semester period.

3.2.2. TESTING

NS Power has been provided remote access to NSCC's BMS to control the Coritech bi-directional charger. Use case testing has been conducted remotely in real-time through the NSCC BMS since August 9, 2022. A reoccurring inverter fault with the Coritech charger has impacted charger functionality and data availability, and NS Power is working with Coritech and NSCC to resolve the issue.

NS Power has access to Fermata Energy dashboards to view data and track events from the Fermata FE-15 installed in Q4 2022. Currently, events for the FE-15 must be scheduled through Fermata staff by providing details of the events ahead of time via email. NS Power expects to obtain full user control of the FE-15 in March 2023. The Fermata FE-15 model will be replaced by the Canadian certified FE-20 model once it becomes available in the second or third quarter of 2023.

Available use-cases are cycled (rotated) on a weekly basis. Table 3 summarizes all Coritech bi-directional charging events run since the start of remote testing in August 2022.

Table 3 – Summary of Events Dispatched to Coritech EV Charger, since August 2022

	EVSE1	EVSE2	EVSE3-modified	EVSE5	EVSE4	All
First Event Date	8/9/2022	8/5/2022	8/16/2022	8/26/2022	10/31/2022	8/5/2022
Period End Date	12/31/2022	12/31/2022	12/31/2022	12/31/2022	12/31/2022	12/31/2022
Number of Events	6	10	4	2	31	53

Table 4 summarizes all the Fermata bi-directional EV charging events that have run since the beginning of testing in November 2022.

Table 4 – Summary of Events Dispatched to Fermata Bi-directional EV Charger in November 2022

	EVSE1	EVSE2	EVSE3	All
First Event Date	12/15/2022	12/5/2022	11/14/2022	11/14/2022
Period End Date	12/31/2022	12/31/2022	12/31/2022	12/31/2022
Number of Events	2	4	15	21
Estimated Average Reduction per Event (kW)	5.1	5.1	5.1	5.1

'Estimated Average Reduction per Event (kW)' is the average actual discharge power observed for an event. The nominal set point for discharge is 5 kW. NS Power will be investigating additional discharge levels, eventually up to the 15-kW nominal maximum. NS Power will continue to expand on testing scenarios in 2023, particularly EVSE5, once NS Power has full user control of scheduling events (currently anticipated in March 2023).

NS Power began testing demand charge management (DCM) functionality of the Fermata unit on December 14, 2022. Automated DCM is one of the main differentiators between the Fermata (included) and Coritech unit (manual DCM, out of the box). Additionally, the vehicle used for testing on the Fermata unit is available for V2G at all times as it is dedicated to testing, meaning there will be no availability limitations or empirical data on availability presented.

EVSE1 – LOAD LEVELING, DAY AHEAD GENERATION PLANNING

Discharge during the two highest consecutive peak hours of the day. Introduced for Coritech on August 9, 2022. Fermata EVSE1 use case testing was introduced on December 15, 2022.

This use case is based on economic dispatch and analysis will be completed in conjunction with the business model presented in future reporting. The use case will continue to be included in the schedule for execution.

EVSE2 – LOAD LEVELING, INTRA-DAY GENERATION PLANNING

Intra-day Economic Dispatch: discharge during the two highest consecutive peak hours of the day. Introduced for Coritech on August 5, 2022. Fermata EVSE2 use case testing was introduced on December 5, 2022.

This use case is based on economic dispatch and analysis will be completed in conjunction with the business model presented in future reporting. The use case will continue to be included in the schedule for execution.

EVSE3 – LOAD LEVELING, TIME-VARYING CURTAILMENT

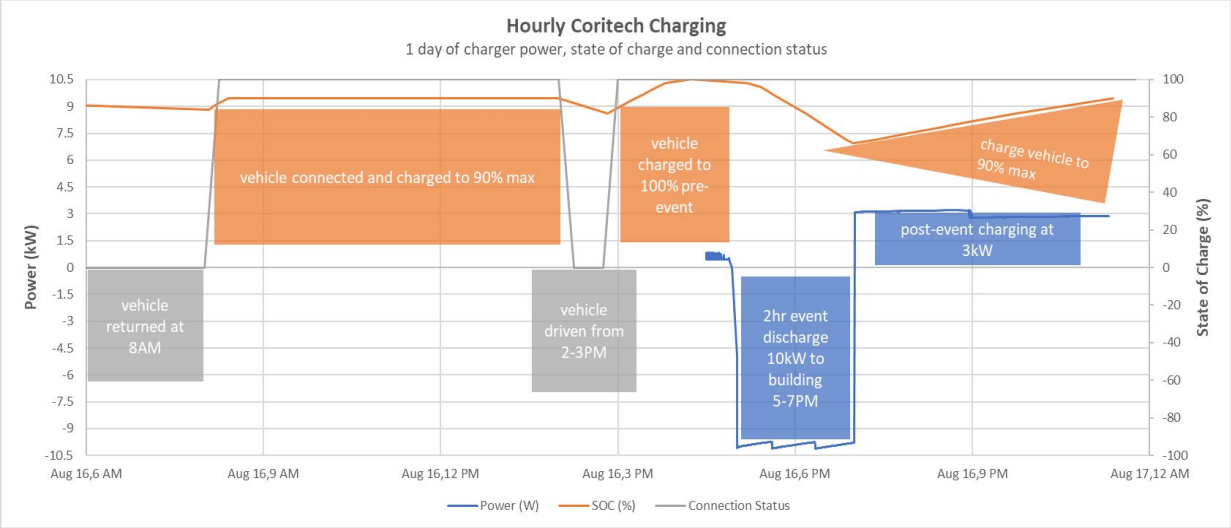
Modified Time-Varying Curtailment (17:00 to 19:00 window only). Discharge during the 17:00 to 19:00 window. Introduced for Coritech on August 16, 2022. Fermata EVSE3-modified use case testing was introduced on November 14, 2022.

Coritech – August 16, 2022, example:
Figure 25 depicts the technical capability of the Coritech bi-directional charger to discharge power from the EV back to the building during the Nova Scotia grid peak between 17:00 and 19:00. The EV was plugged in at 08:00 and charged to the maximum state of charge (SOC) setpoint in the BMS of 90%. The EV was driven by an NSCC employee from 14:00 to 15:00, then reconnected and charged from 82% to the adjusted

maximum SOC setpoint of 100%. Note that power data for the charger is not available from the NSCC BMS during 00:00 to 04:30. The EV was connected and available outside of working hours, as expected; therefore, NS Power was able to remotely discharge power from the EV back to the building at an average rate of 10 kW during the 17:00 to 19:00 period, as shown by measured charger power in Figure 25. During the event, the vehicle SOC was reduced from 100% to 66% and discharged 19.9 kWh to the building.

As the vehicle is not typically used outside of working hours, generally there would be at least 12 hours available to recharge following a similar discharge event. Therefore, at the end of the event, NS Power set the Coritech Power to 3 kW – which was 0.5 kW more than the minimum charge rate accepted by the Coritech charger – to allow the EV to charge overnight. At a charging rate of 3 kW, the vehicle reached the maximum SOC setpoint of 90% at 23:23.

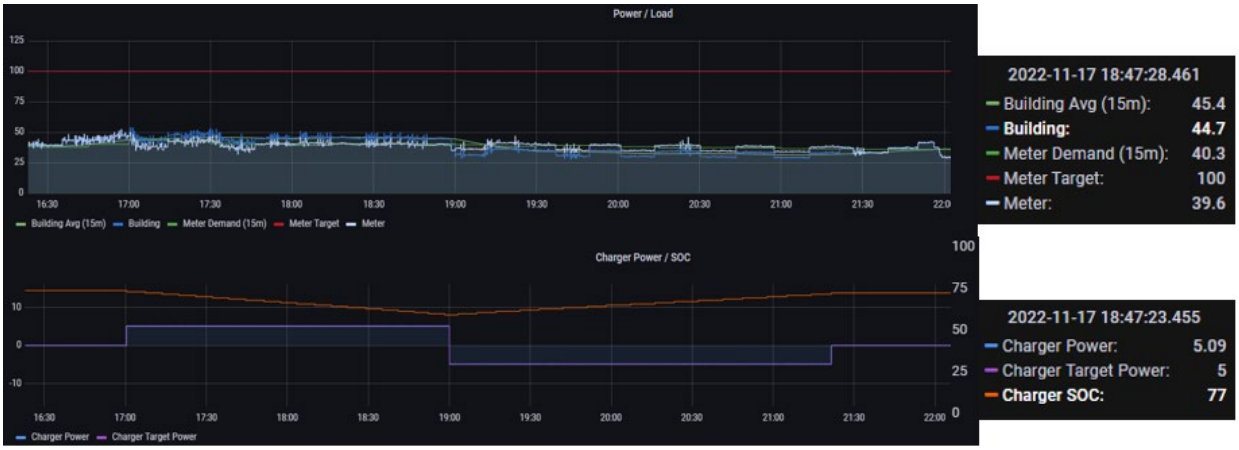
Figure 25 – Summary of EVSE Event Dispatched to Coritech EV Charger on August 16, 2022



Fermata – November 17, 2022, example:

Figure 26 depicts the technical capability to discharge from the EV battery during the Nova Scotia grid peak, between 17:00 and 19:00, by discharging from the vehicle battery. In this example, NS Power is discharging 5 kW back to the building. Figure 26 presents two graphs: the top graph ('Power / Load') illustrates in the right-hand summary values the difference of 5.1 kW between the 'Building' (44.7 kW) versus 'Meter' (39.6 kW) readings; this demonstrates the discharge. The bottom graph ('Charger Power / SOC') depicts the 5.1 kW discharge, immediately followed by a charging session to return the battery's SOC.

Figure 26 – Fermata's Grafana Dashboard Depicting a 5 kW Discharge Event from 17:00 to 19:00, Followed by a Charging Session



EVSE4 – INTERMITTENT RENEWABLE GENERATION FOLLOWING

Modified Intermittent Renewable Generation Following use case testing was introduced for Coritech on October 31, 2022. This manually executed use case involves variations on dispatch approach, as described below, which all aim to move energy consumption from periods of low wind generation to high wind generation. For each variation, the EV begins the event day at the target SOC and is charged, or discharged, at the end of the working day to bring the EV back to the target SOC by the following morning.

- Charge, or discharge, based on bands dictated by day ahead forecasted wind generation during regular working hours, as depicted in Table 5. A negative power command represents power flow from the EV to the building, and a positive power command represents power flow from the building to the EV.

Table 5 – EVSE4 Power Command Bands based on Forecasted Wind Generation

Forecasted Wind Generation (kW)	Power Command (kW)
<100	-10
100-200	-5
200-300	0
300-400	5
>400	10

- Charge during the two highest consecutive forecasted wind generation hours of the day. Charge rates tested: 5 kW, 7.5 kW and 10 kW.
- Discharge during the two lowest consecutive forecasted wind generation hours of the day. Discharge rates tested: 5 kW, 7.5 kW and 10 kW.

EVSE4 events have not yet been executed for the Fermata bi-directional charger. No functionality for integrated, automated execution of events is expected to be available during the pilot period, however, as mentioned above, the project team expects to have manual, remote control over the unit in Q1 2023 and in the interim will work with Fermata to develop a manual process for including wind forecast into future event dispatch. Results will be presented in future reporting.

EVSE5 – GENERATION CONTINGENCY (10-MINUTE OPERATING RESERVE)

A prioritized 'stand-by' use case that cannot be scheduled but is run when the condition is present. Discharge for two hours based on NS Power Large Interruptible Industrial rate advisory being issued. Introduced for Coritech on August 5, 2022. When available, EVSE5 takes priority over all other use cases, though only one 2-hour event can run each day. EVSE5 events were dispatched on the following dates: 11/15/2022, and 11/24/2021. EVSE5 has not been executed on the Fermata FE-15.

The ability to respond to 10-minute operating reserve generation contingency events was proven to be technically successful during the second half of 2022. On November 15, 2022 at 10:15, when the vehicle was available, NS Power successfully received an interruptible advisory notification and acted within 10 minutes to run a discharge event on the Coritech charger at NSCC.

The vehicle was discharged for a portion of the planned 2-hour event, from 10:15 until it was disconnected for transportation at 11:30, resulting in an estimated 12.4 kWh of energy discharged back to the building during the interruption advisory period. The charger experienced an inverter fault during the event when it was unplugged, resulting in empirical data not being available for the remainder of the event and a significant portion of the day. The inverter fault will be resolved with support from Coritech and further EVSE5 testing will continue in 2023.

Once NS Power receives full user control of the Fermata FE-15 to schedule events, then it will proceed with EVSE5 testing on the Fermata system.

EVSE6 – COLD LOAD PICKUP RELIEF

No functionality for integrated, automated event creation is expected to be available during the pilot period for Fermata or Coritech. It is contemplated that modelling this use case using real charging data from the vendor interfaces against real historical feeder data from real congested feeders measured in our normal course of business may provide additional insight for this use case to be presented in future reporting. The application of this use case will also be further evaluated throughout testing in 2023.

EVSE7 – DISTRIBUTION CONGESTION MANAGEMENT

No functionality for integrated, automated event creation is expected to be available during the pilot period for Fermata or Coritech. It is contemplated that modelling this use case using real charging data from the vendor interfaces against real historical feeder data from real congested feeders measured in our normal

course of business may provide additional insight for this use case to be presented in future reporting. The application of this use case will also be further evaluated throughout testing in 2023.

EVSE8 – PARTIAL OR WHOLE HOME BACKUP

The Coritech and Fermata units were both installed in existing buildings that were not configured for partial backup or critical loads to be isolated during outage conditions and reconfiguration of existing buildings was out of scope of this project. Further evaluation and modelling for these installations will be completed through the final phase of the project. In addition, further opportunities will be evaluated for potential study of partial backup or critical load to be supplied from bi-directional chargers, in particular in a residential setting.

EVSE9 – C&I CUSTOMER DEMAND REDUCTION

Also referred to as demand charge management – discharge during periods of facility peak demand to reduce monthly peak demand and, therefore, monthly demand charge for the customer. Modified C&I Customer Demand Reduction use case testing was completed manually by NSCC's Energy Sustainability Engineering Technology (ESET) program using the Coritech charger in March 2022.

The goal of the testing was to reduce monthly peak demand and, therefore, monthly demand charge for the building during the month of March. The test plan was to discharge the EV to the campus at a rate of 10 kW on weekdays, excluding holidays, from 11:30 to 13:00, which was determined to be a period of high demand for the building. Ideally, the testing period would align with the top monthly demand peaks which would then be reduced – resulting in a reduced monthly demand charge.

An ESET student at NSCC has compiled data into a report regarding the testing results, which will be refined and inform further analysis by the NS Power team. The results are summarized in the following observations:

- Faculty and students were unable to complete all tests periods as planned due to operational errors/issues and scheduling conflicts – as a result the monthly peak was not reduced.
- Regardless of the operation and scheduling issues, analysis of the monthly demand profile demonstrated that the planned discharge sessions would have successfully reduced monthly demand.
- Operational errors and scheduling conflicts would have been eliminated by automating the testing process – a recommendation in future cases. Manual dispatch resulted in missed peaks and inconsistent discharge sessions. Peak demand reduction could be maximized by integrating both the bi-directional charger and building meter with a building management system, allowing for automation and improved management.
- Further analysis of the monthly demand profile indicated that monthly demand could have been reduced further by increasing the discharge rate.
- Demand charge management with bi-directional EV chargers would be more impactful at reducing monthly demand at facilities with consistent energy demand profiles and peak periods that are substantial and shorter in duration.

- Demand charge management would be more impactful for customers with access to:
  - a fleet of EVs and bi-directional chargers;
  - EVs with larger battery capacity; or
  - an EV usage schedule that aligns with peak periods.

C&I Customer Demand Reduction use case testing was introduced on the Fermata charger in December 2022. With the FE-15, NS Power can pre-set a building demand threshold that, once reached, signals the charger to automatically discharge to offset high building demand.

Fermata – December 22, 2022, example:

Figure 27 depicts the technical capability of the Fermata bi-directional charger to discharge from the battery automatically based on a strategically pre-set 'Meter Target,' in kW. Once the building load exceeds the meter target, the charger discharges from the battery to the building to counter the high demand. In the top graph of Figure 27, ('Power / Load'), the difference in the 'Building' (65.4 kW) versus 'Meter' (50.3 kW) demonstrates the discharge power of 15.1 kW.

The charger will discharge to the building until the measured demand falls under the meter target, or until a minimum state of charge rule is reached. Currently, the building demand reading is not representative of the full building load, but by adjusting the meter target within range, the functionality is demonstrated.

Figure 27 – Fermata's Grafana Dashboard Depicting the DCM Response



3.3. RESIDENTIAL BATTERIES

3.3.1. OBSERVATIONS

BASELINE DATA OBSERVATIONS

Sunverge residential battery baseline data was captured from a database available to the project team from Sunverge. This data will be used for initial baseline analysis; however, next steps include capturing time

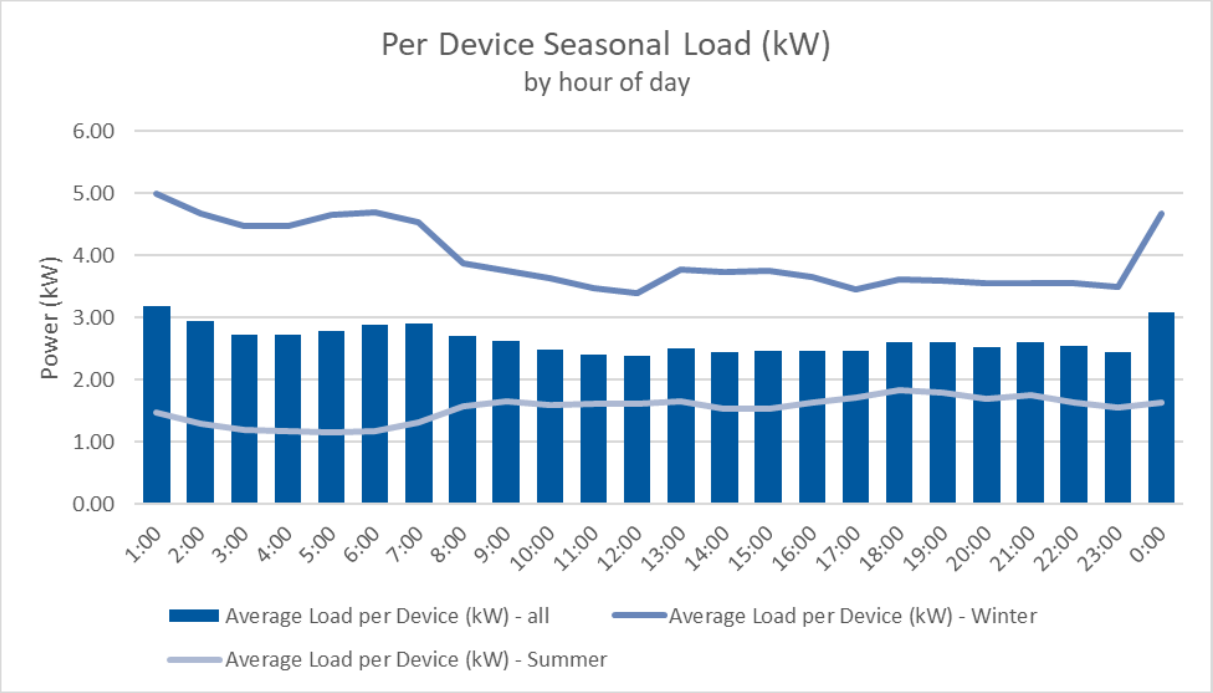
series interval data through the ESP integration for additional in-depth data review and use within the business model.

Tesla Powerwall baseline data was captured from the Tesla Powerhub portal for initial baseline data analysis. As devices are enrolled to Powerhub, the historical data will be available from date of commissioning. Integration to ESP is ongoing and expected to be completed during Q1 2023. For this reporting period, due to technical challenges enrolling some customer units into the Powerhub interface, the data is based on 85 of the 109 installed units.

BASELINE ENERGY CONSUMPTION BY HOUR

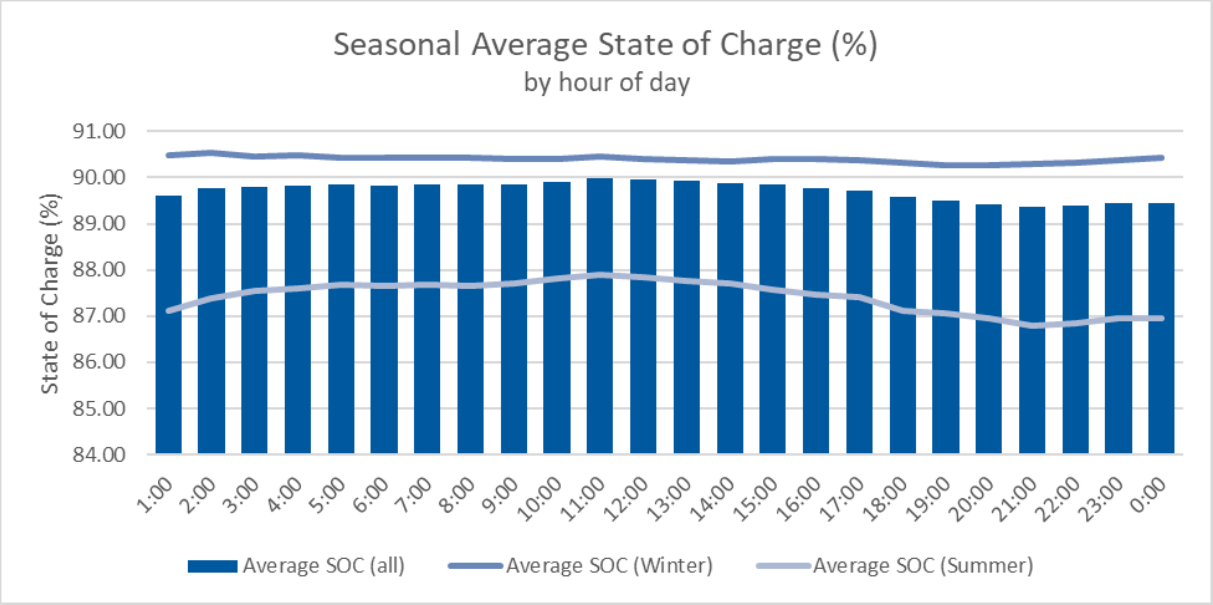
Sunverge Fleet

Figure 28 – Sunverge Residential Battery, per Device Site Load, presented Seasonally



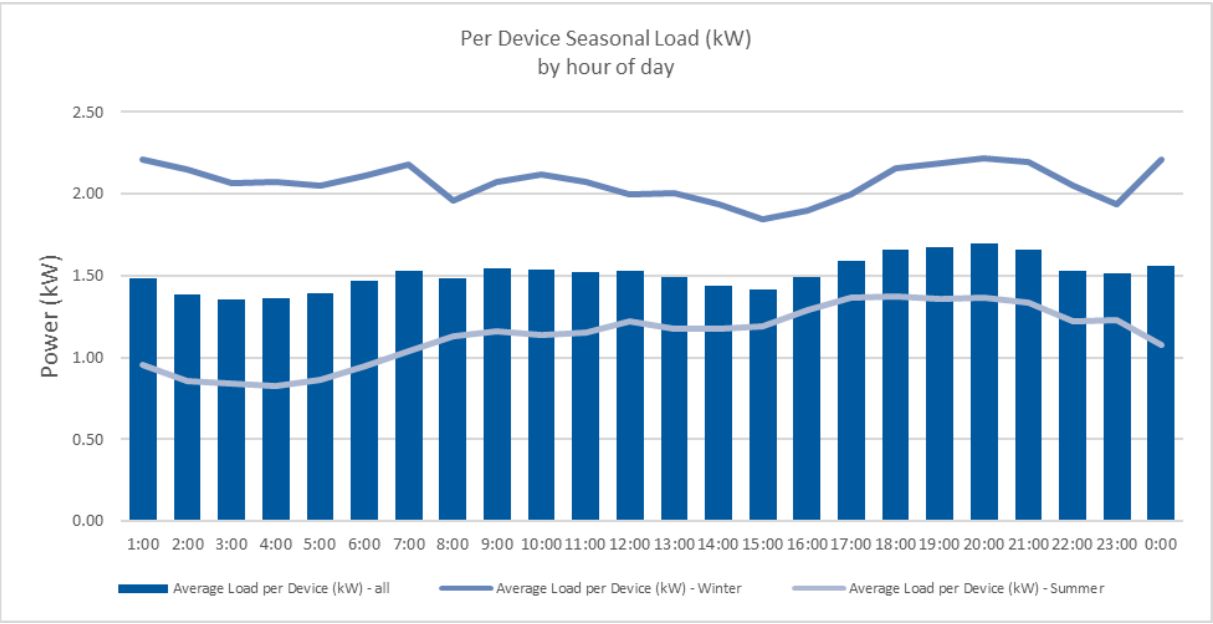
As shown in Figure 28 and Figure 29, the customer load will provide some insight to the availability of battery capacity for use case execution. Since residential battery installation currently has a limitation not to export beyond the meter, this metric indicates the available capacity to support the grid. In the future, this limitation could be re-evaluated and/or removed.

Figure 29 – Average State of Charge for Sunverge Residential Batteries, by Hour of the Day



Tesla Powerwall Fleet

Figure 30 – Tesla Powerwall Residential Battery, per Device Site Load, by Hour of the Day

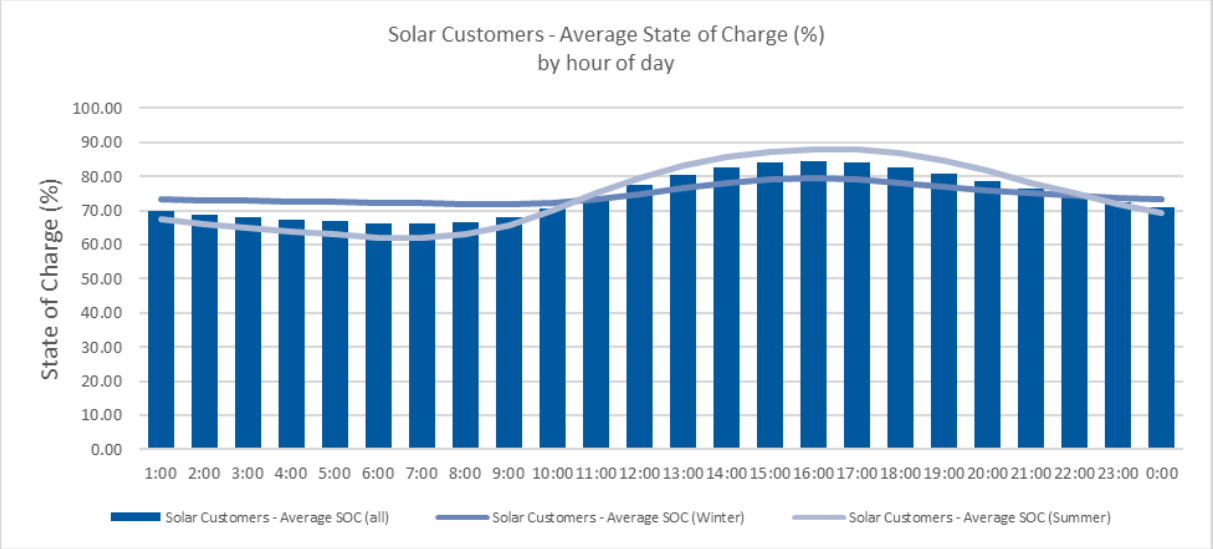


As shown in Figure 30, the customer loading will provide some insight to the availability of battery capacity for use case execution. Since residential battery installation currently has a limitation not to export beyond the meter, customer loading indicates the available capacity to support the grid. In the future, this limitation could be re-evaluated and/or removed.

SOLAR + STORAGE

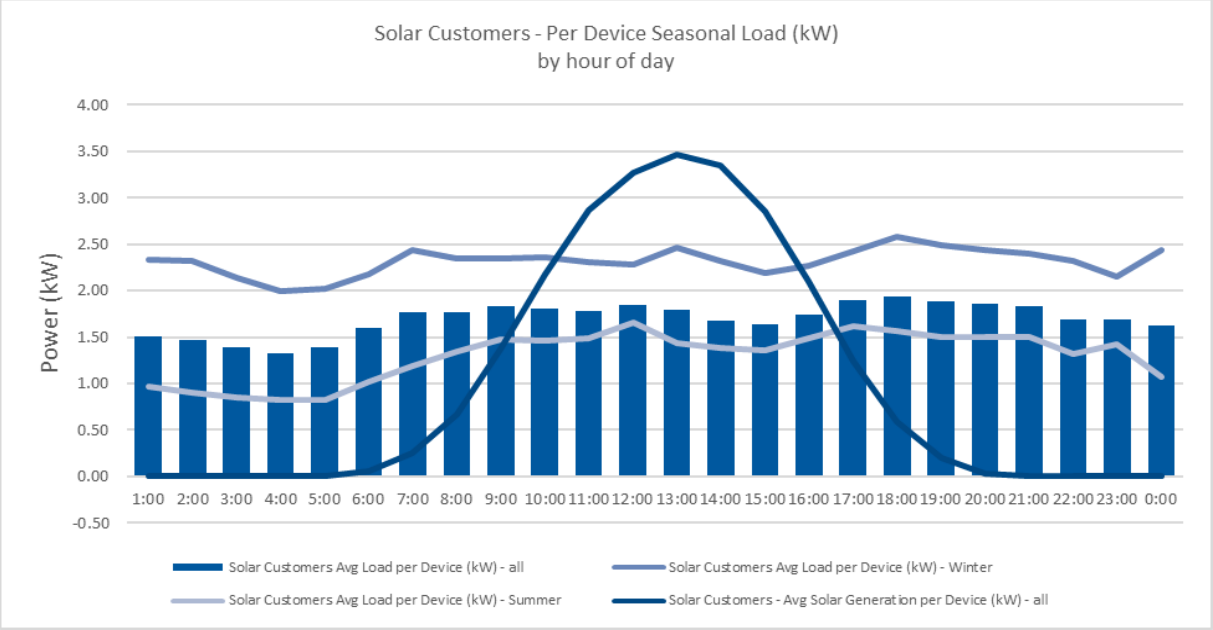
Of the 85 Powerwall units for which the data is based, 19 are AC coupled solar + storage. These customers have installed their own residential photovoltaic (PV) solar arrays either before or after receiving the battery, but the two systems are integrated together in most cases.

Figure 31 – Average State of Charge for Aggregated Fleet of Tesla Powerwall Batteries with Solar Installed



As shown in Figure 31, battery state of charge increases through the daytime hours where solar production is highest. The seasonality of this pattern shows the summer period average State of Charge to be higher than the winter, through the evening period, which is to be expected as solar production is also higher during this season.

Figure 32 – per Device Customer Usage for Aggregated Fleet of Tesla Powerwall Batteries with Solar Installed, including Solar Generation (kW)



Further review of solar plus storage, including any customers participating in this operating mode in the Sunverge fleet will be discussed in future reports.

TIME-BASED CONTROL

Figure 33 – Average State of Charge for Aggregated Fleet of Tesla Powerwall Batteries with Time-based Control Configured

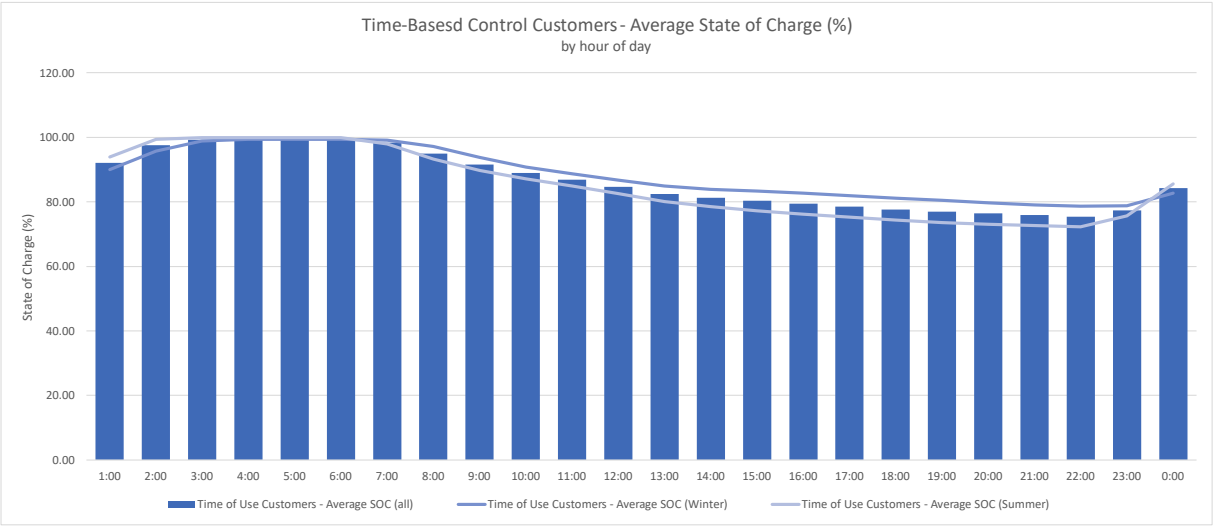


Figure 33 depicts that, during on-peak hours, the Tesla time-based control mode discharges the battery through to 23:00, followed by an off-peak charging period. This configuration was managed by the

customer through the Tesla app; however, this functionality has since been removed as utility integration is ongoing leading toward use case execution beginning.

Figure 34 – per Device Customer Usage for Aggregated Fleet of Tesla Powerwall Batteries with Time-based Control Configured

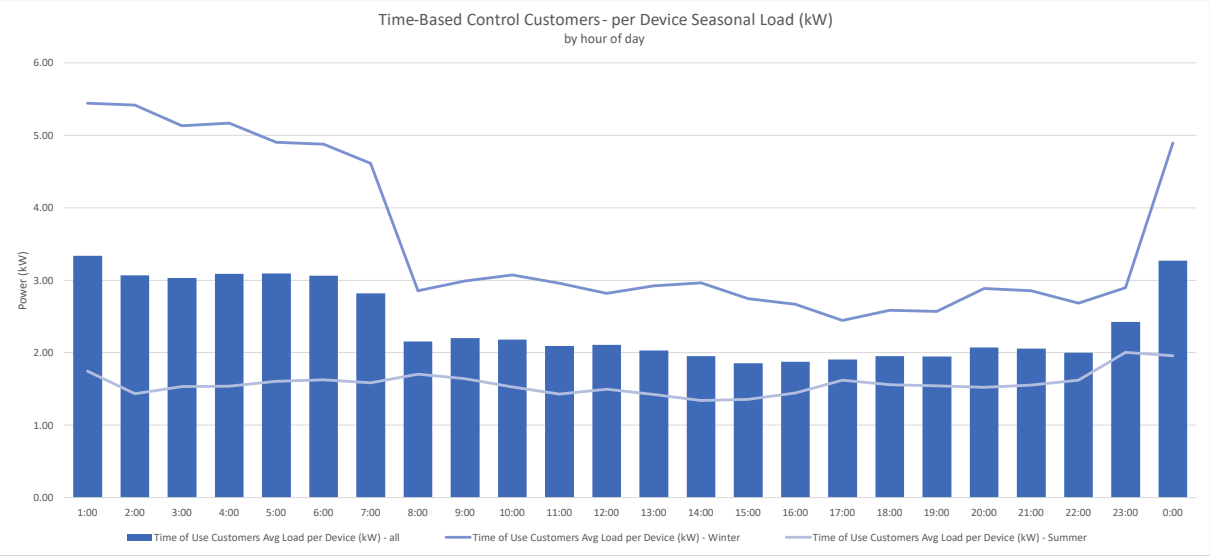


Figure 34 shows the site load being offset by the battery dispatch during on-peak times. Further review of time-based control, including any customers participating in this operating mode in the Sunverge fleet will be discussed in future reports.

3.3.2. TESTING

The Sunverge integration to ESP has been completed but defects within the integration have delayed use case execution with customer devices to date. This is expected to be resolved in Q1 2023. To date, integration and conformance testing in the ESP test environment, with a test unit located at the Sunverge laboratory, has been completed.

Since the Tesla Powerwall integration to ESP is in development, no ESP-driven use cases have been executed, to date.

No use case testing has been completed yet, outside of SV/PW8 – Partial Home or Critical Load Backup. Further reporting and analysis of these use case results will be presented in future reporting.

SV/PW1 – LOAD LEVELING, DAY AHEAD GENERATION PLANNING

Battery dispatch through pool dispatch or manual events, based on day ahead generation planning, marginal cost-based forecast. ESP constraints maintain one charge/discharge cycle per day.

No results to report.

SV/PW2 – LOAD LEVELING, INTRA-DAY GENERATION PLANNING

Battery dispatch through pool dispatch or manual events, based on Intra-day generation planning process based on system loading and wind forecast. ESP constraints to maintain one charge/discharge cycle per day.

No results to report.

SV/PW3 – LOAD LEVELING, TIME-VARYING CURTAILMENT

Initially, Modified Time-Varying Curtailment during 17:00 to 19:00 window will be executed via manual events using the vendor portal or coordinating with the distributor upon system functionality availability. This will be followed by alignment to NS Power's time-of-day rate (i.e. rate 06B) for automatic execution of curtailment events during on-peak hours through ESP.

No results to report.

SV/PW4 – INTERMITTENT RENEWABLE GENERATION FOLLOWING

ESP automatically triggers charge or discharge events, or pool-based dispatch, based on near real-time system wind generation received via PI integration. The intent is to follow generation and shift energy consumption from periods of low renewable energy generation to periods of high generation.

Sunverge batteries will be dispatched based on OpenADR simple signals and Tesla Powerwall batteries will be dispatched based on a full DNP3 point list, which will include more comprehensive control. As a second phase test, the community solar garden generation profile will also be used as an input for renewable following.

No results to report.

SV/PW5 – GENERATION CONTINGENCY (10-MINUTE OPERATING RESERVE)

This use case will dispatch residential batteries to support system generation reserve capacity based on issuance of any NS Power Large Interruptible Industrial rate advisories. This use case takes priority over other use cases.

No results to report.

SV/PW6 – COLD LOAD PICKUP RELIEF

This test will dispatch residential batteries for a short time following an extended feeder outage, so as not to compound the effect of 'cold load pickup.'

No results to report.

SV/PW7 – DISTRIBUTION FEEDER CONGESTION MANAGEMENT

ESP automatically triggers charge or discharge events, or pool-based dispatch, based on near real-time system feeder loading data received via PI integration with the intent to offload periods of feeder peak congestion by discharging residential battery storage.

No results to report.

SV/PW8 – PARTIAL HOME OR CRITICAL LOAD BACKUP

Introduced from date of device commissioning, which varies by battery, this use case is an inherent functionality of the device. This functionality has been enhanced by the project team by ensuring that storm preparations are undertaken, and batteries are fully charged prior to an expected weather event.

The integrations between ESP and residential batteries were not yet functional, as of the current reporting period. However, commands were sent to the devices from the Sunverge portal, or via coordination with the Powerwall distributor (MPower), to ensure a fully charged battery ahead of forecasted weather events.

Storm preparation was undertaken for residential batteries on the following days to ensure Partial Home Backup would have maximum availability:

- September 22, 2022 – duration of weather event
- November 10, 2022 – duration of weather event
- November 30 to December 2, 2022
- December 12 to 14, 2022 – inclusive of only those batteries in North region and Cape Breton
- December 22 to 25, 2022

Further analysis will be presented in future reporting.

3.3.3. CUSTOMER EXPERIENCE OBSERVATIONS – RELIABILITY

Residential batteries were able to support customers during severe weather events, as well as any other outage conditions.

NS Power issued customer surveys following a severe weather event during the reporting period. Customer feedback included the following key insights.

- 96% of pilot participants who experienced an outage reported their battery turned on and provided back-up power as they expected.
- When asked whether participants believe their battery will provide sufficient back-up power in the event of an outage, customer confidence increased from 87% to 96%, following the weather event.
- The number of participants exploring additional sources of back-up power decreased from 55% to 44% following their experience using battery storage during the severe weather event.

3.4. C&I BATTERIES

Construction and commissioning at C&I sites was completed in the second half of 2022. Additional functionality for zero export mode was also implemented and tested during this reporting period. Early integration conformance testing is underway; however, no ESP-driven use case testing has been executed to date.

3.5. C&I SOLAR PV

All three C&I sites were commissioned, and integration work is ongoing. Additional functionality for zero export mode was also implemented and tested during the current reporting period. No use case testing to report currently.

3.6. COMMUNITY SOLAR PV

Community solar garden site metrics from July 1 to December 31, 2022 are provided in Attachment 4 – Solar Garden Specific Metrics.

The NS Power Telecom link to the interconnection recloser at the community solar garden will be completed in Q1 2023. Pending the final integration of the solar garden generation into the NS Power PI database, renewable following use cases can be executed with other asset types to follow the generation at this site. Analysis will be included in a future report.

3.7. C&I BUILDING MANAGEMENT SYSTEM

3.7.1. OBSERVATIONS

CUSTOMER NOTIFICATION MANAGEMENT

Through the BMS, all three customers have visibility into their current building's operating mode and are able to return the building to standard operating mode – from either 'OFFPEAK' or 'ONPEAK' mode – to opt out of an event. On request, two customer sites are receiving an email notification prior to each event, for which they can reply with a request to opt-out of an upcoming event before it begins. To date, there have been no customer opt-outs.

3.7.2. TESTING

All test events below included one-to-three customer sites. Events started on February 14, 2022, with the first integrated site and continued until the end of February, at which time testing was paused to complete the integration of the other two customer sites. Testing resumed with Site 2 in July 2022 and continued as the remaining sites were integrated. By November 22, 2022, all three sites were involved.

The type of equipment and programmed BMS control actions vary for each customer site, as follows:

- Site 1 – controlled equipment includes hot and chilled water pumps, fan coils, and heat recovery ventilation (HRV) units.
- Site 2 – controlled equipment includes air handling units and water pumps.
- Site 3 – controlled equipment includes in-floor heating, air handling units, and lightning.

Aggregated power of controlled equipment, which is calculated by the BMS based on equipment nameplates and trends and not measured directly, is available for each customer site in ESP.

Table 6 summarizes all events that have run since the start of testing. The majority of events included only the first integrated site and were conducted for BMS3 use case, for which customer load was reduced between the hours of 17:00 and 19:00.

'Estimated Average Reduction per Event (kW)' is the average reduction in power observed for an event across all participating sites. Since the estimated average reduction per event metric is impacted by site-specific reduction and participation, it has been provided for each site. These metrics are specific to the three participating sites and may be useful to help predict the demand (kW) reduction value for similar equipment only.

Estimated average event savings for each site was determined using the same approach as Phase 2 of the E1/NS Power C&I Demand Response pilot. However, ESP-sourced power trend data for controlled equipment was used as the input, rather than utility metering, due to the load reduction being a small percentage of building load – and therefore, getting lost in the noise. The approach compares average power during the event period against the highest 6 of 10 earlier baseline days (excluding event days, holidays, and weekends) and applies an adjustment factor to account for potential differences across baseline and event days.

Table 6 – Summary of Events Dispatched to C&I BMS since February 2022

	BMS1 Modified	BMS3	BMS10	All
First Event Date	12/6/2022	2/14/2022	12/12/2022	2/14/2022
Period End Date	12/31/2022	12/31/2022	12/31/2022	12/31/2022
Number of Events	4	14	2	20
Expected Event Participation	12	14	6	32
Received Event Notification	12	14	6	32
Opt-Outs	0	0	0	0
Opt in Ratio	100%	100%	100%	100%
Estimated Average Reduction per Event (kW)	12.6	3.4	10.3	5.5
Site 1 - Estimated Average Reduction per Event (kW)	4.8	1.2	3.0	2.2
Site 1 - Event Participation	4	12	2	18
Site 2 - Estimated Average Reduction per Event (kW)	8.0	16.0	12.5	10.4
Site 2 - Event Participation	4	1	2	7
Site 3 - Estimated Average Reduction per Event (kW)	25.5	18.0	16.0	21.7
Site 3 - Event Participation	4	1	2	7

BMS1 – LOAD LEVELING, DAY AHEAD GENERATION PLANNING

Reduce customer load during the highest consecutive peak hours of the day. Max. 4-hr duration. Introduced on December 6, 2022. Estimated Average Reduction per Event (kW) results to date are shown in Table 6.

This use case is based on economic dispatch and analysis will be completed in conjunction with the business model presented in future reporting. The use case will continue to be included in the schedule for execution.

BMS2 – LOAD LEVELING, INTRA-DAY GENERATION PLANNING

Reduce customer load during the highest consecutive peak hours of the day. Maximum 4-hour duration. As of December 31, 2022, testing has not been completed for this use case, as the project required at least 12 hours' notice to customers during the first period of testing to identify any potential customers issues. Since no customer issues have been experienced to date, the project team is planning to complete BMS2 testing with customers who confirm they are comfortable with shorter event notification (i.e. less than 12 hours' notice).

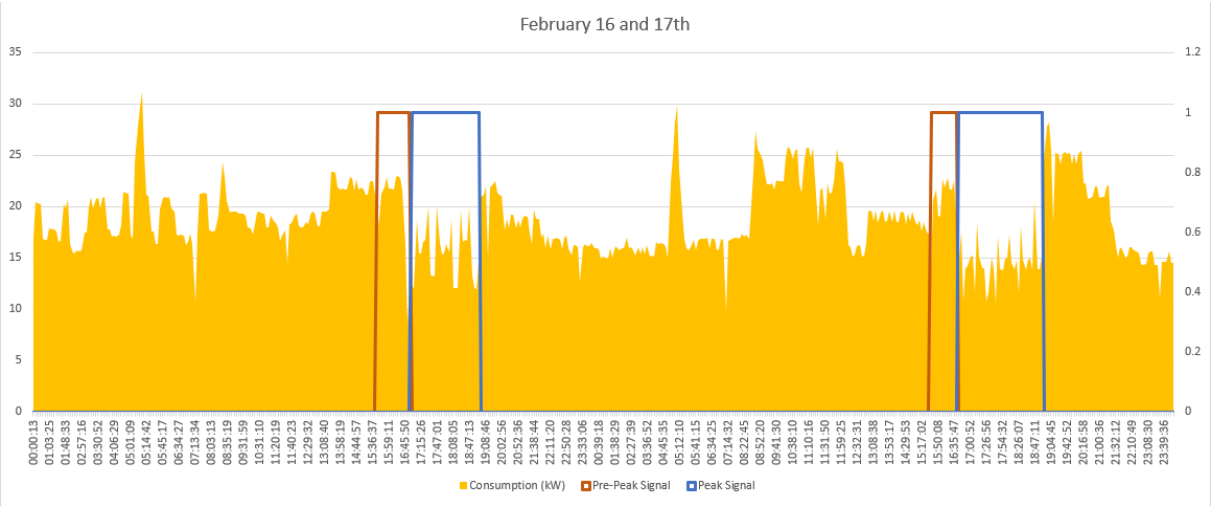
BMS3 – LOAD LEVELING, TIME-VARYING CURTAILMENT

Modified Time-Varying Curtailment (17:00 to 19:00 window only). Introduced on February 14, 2022. Estimated Average Reduction per Event (kW) results to date are shown in Table 6.

Figure 35 shows demand reduction events completed on February 16 and 17, 2022. The controlled (influenced) load decrease is evident during the 17:00 to 19:00 peak event periods, which is indicated by 'Peak Signal.' Pre-event heating/cooling periods were scheduled during the 1-hour period leading up to events to minimize customer impact during events, which is indicated by 'Pre-Peak Signal.' Measurement and verification (M&V) of February testing was completed by the E1/NS Power Demand Response Working

Group (DRWG) using the site's advanced metering infrastructure (AMI) data since submetering was not available; however, shifted load was minor compared to overall building load.

Figure 35 – Figure indicating Demand Reduction Events for Customer Site 1



Investigation into adding other controlled loads was completed with Siemens and the customer, with the aim to increase load reduction capacity for the upcoming winter season. However, due to the requirement to integrate any additional equipment into the customer's BMS, the decision was made to investigate increased demand reduction actions for equipment that was already integrated. Investigation into increasing demand reduction actions for existing integrated equipment for all three customer sites is ongoing.

The use case will continue to be included in the schedule for execution and results and analysis will be presented in future reporting.

BMS5 – GENERATION CONTINGENCY

A prioritized 'stand-by' use case (that cannot be scheduled but is run when the condition is present). Customer load will be reduced for a maximum 4-hour duration based on NS Power Large Interruptible Industrial rate advisory being issued. When available, BMS5 takes priority over all other use cases, with the exception of BMS10, though only one event can run each day. As of December 31, 2022, testing has not been completed for this use case, as the project required at least 12 hours' notice to customers during the first period of testing, to identify any potential customer issues. Since no customer issues have been experienced to date, the project team is planning to complete BMS5 testing with customers who confirm they are comfortable with shorter event notification, as little as a few minutes, to support Generation Contingency events.

BMS10 – CRITICAL PEAK REDUCTION

Maximum 4-hour duration during 07:00 to 11:00 or 17:00 to 21:00 between December 1, 2022 and February 28, 2023). Aligns with the single use case being tested as part of Phase 2 of the E1/NS Power C&I Demand Response pilot which involves the procurement of a DR aggregator – as described in the 'Role of EfficiencyOne (E1)' section of the covering letter to this semi-annual report. Introduced on December 12, 2022.

Estimated Average Reduction per Event (kW) results to date are shown in Table 6.

The use case will continue to be included in the schedule for execution and results and analysis will be presented in future reporting.

December 19, 2022 – example:

Figure 36, Figure 37, and Figure 38 demonstrate the technical capability of reducing the load at three customer sites through direct control of equipment through ESP during a Nova Scotia grid critical peak from 17:00 to 19:00. The estimated average event reduction varies for each site, with Sites 2 and 3 demonstrating higher kW savings than Site 1.

Programmed reduction actions for equipment are set conservatively to test customer impact. To-date, NS Power has not received any customer complaints. Therefore, more aggressive equipment actions are planned to be tested in the future with the aim of increasing load reduction at each customer site, and specifically for Site 1.

Figure 36 – Summary of Critical Peak Reduction Event Dispatched to the BMS at Site 1 on December 19, 2022

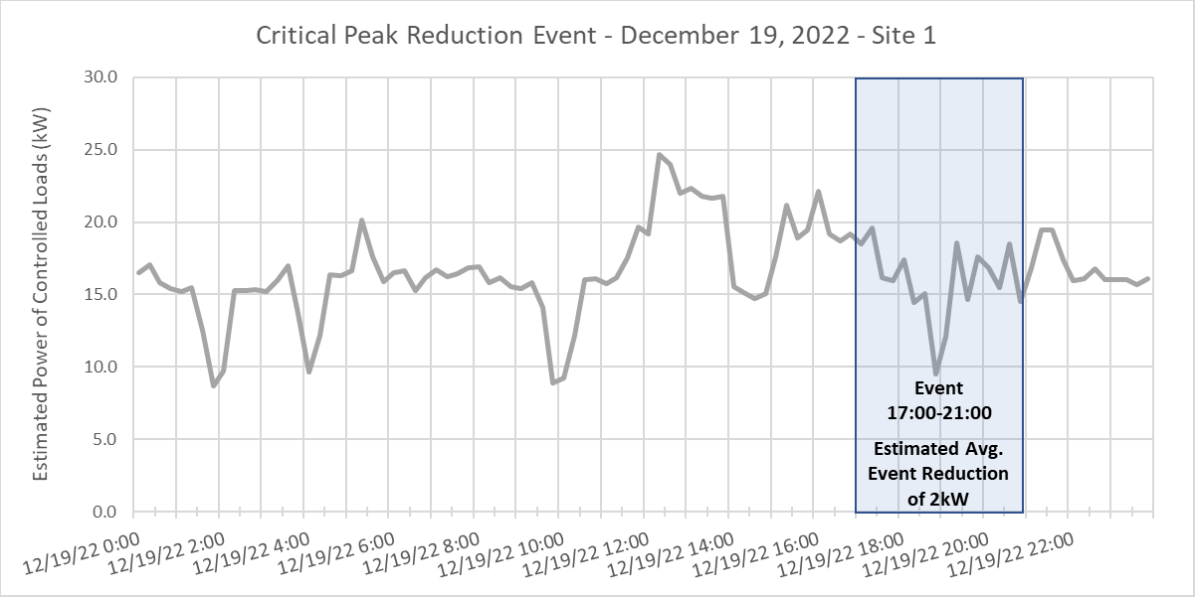


Figure 37 – Summary of Critical Peak Reduction Event Dispatched to the BMS at Site 2 on December 19, 2022

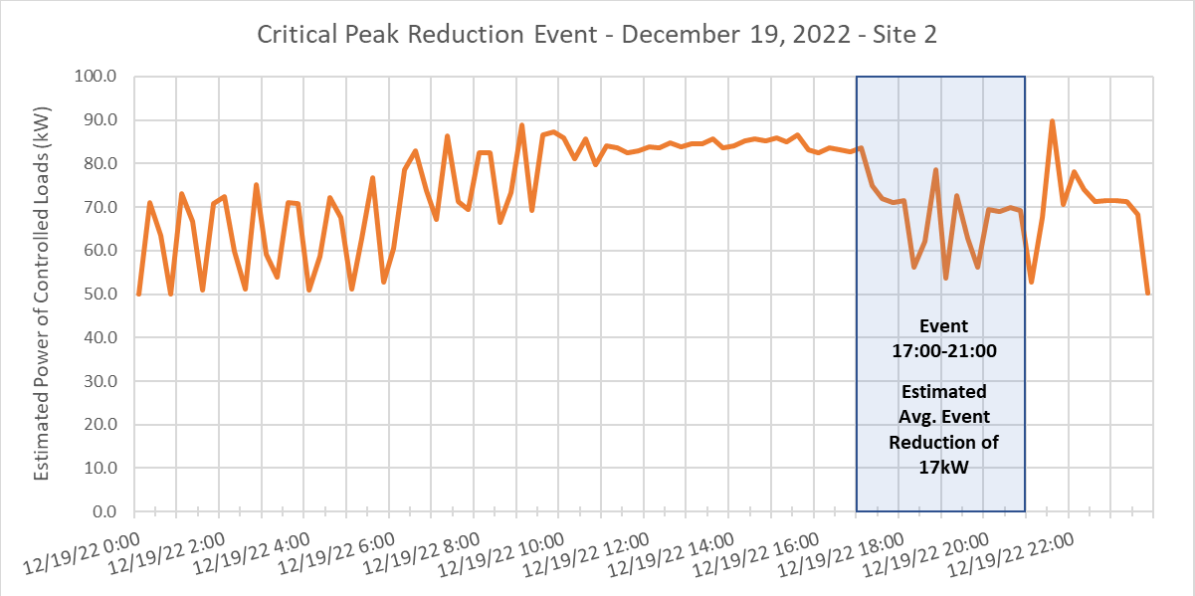
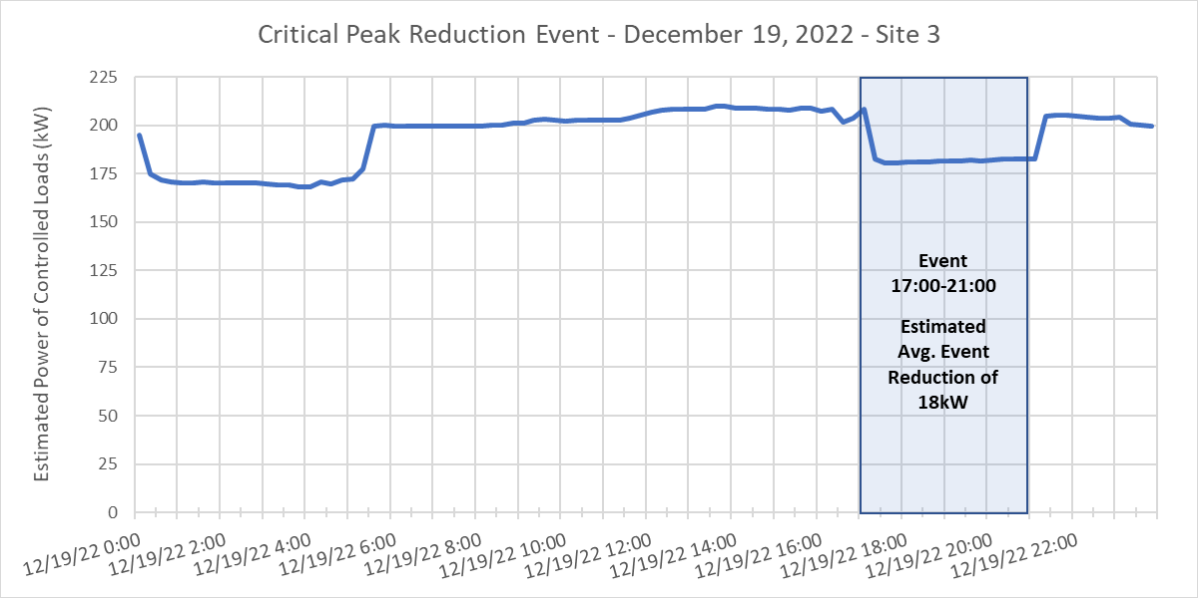


Figure 38 – Summary of Critical Peak Reduction Event Dispatched to the BMS at Site 3 on December 19, 2022



Legend	
White	Pending - not yet started
Blue	Underway - some or all items are being collected
Green	Complete - data can be used for value determination (data collection may still continue)
Purple text	Addition to the testing plan

SGNS Customer Program Enrollment		Value to be Tested			Data and Metrics to Measure System Impact and Value			Project Scenarios for Comparison			Measuring Outcomes	ESP
DER Class	**DER Group**	**Value Streams**	**Processes Applicable to Value Streams**	**DER Control Variables Applied**	**Technical and Functional Data and Metrics**	**System Reliability and Grid Stability Data and Metrics**	**Reduced Upward Pressure on Revenue Requirements Data and Metrics**	**Baseline Scenario** No utility influenced control	**Baseline Scenario 2** Device-level control	**Test Scenario** Direct Utility Control	**Customer Benefit**	**Software Release**
Electric Vehicle Supply Equipment (EV Chargers)	**EV Smart Chargers & EV V2G Chargers**	**Load Leveling (e.g. Peak Demand Reduction)** **EVSE1, 2, 3**	• Day-ahead generation planning (EVSE1) • Intra-day generation planning (EVSE2) • Time varying curtailment or charging-discharging (V2G) schedule (EVSE3)	• Curtailment of EVSE charge power (kW) by control of target charge rate • V2G discharge	• Connection Status & Alarm Status - The availability of EVSE for control during each test (including communication to the chargers, and the customer participation level) • EVSE monitoring signal latency (seconds) • EVSE control signal latency (seconds) • EVSE response time to target kW setpoint after receiving signal (seconds) • Expected and/or forecasted EVSE curtailment kW versus actual curtailment kW (%). Available discharge power versus actual discharge power (%) measured for V2G.	• Aggregated EV charger load (kW) • Aggregated net residential load (kW) • System load (MW) • Aggregated load curtailed (kW) • Aggregated discharge capacity (kW) (V2G)	• Marginal generation cost ($/MWh) • Value of load curtailed ($/kW, $/kWh) • Value of discharge capacity ($/kW, $/kWh) (V2G)	Customer charges as convenient (charging times will be compared with system peaks to understand impact of uninfluenced charging)	Utilize local EVSE settings, controls to achieve a scheduled curtailment or charge-discharge (V2G) schedule	EVSE Control based on: • Day-ahead generation planning • Intra-day generation planning • Time varying curtailment or charging-discharging (V2G) schedule	Economic Dispatch Avoided Generation & Capacity Deferred T&D System Upgrades	Pilot 1/R2b
		Generation Contingency (10 Minute Operating Reserve) **EVSE5**	• Interruptible Rider to the Large Industrial Rate (EVSE5)	• Curtailment of EVSE charge power (kW) by control of target charge rate • V2G discharge	• Connection Status & Alarm Status - The availability of EVSE for control during each test (including communication to the chargers, and the customer participation level) • EVSE monitoring signal latency (seconds) • EVSE control signal latency (seconds) • EVSE response time to target kW setpoint after receiving signal (seconds) • Expected and/or forecasted EVSE curtailment kW versus actual curtailment kW (%). • Available discharge power versus actual discharge power (%) measured for V2G.	• Aggregated EV charger load (kW) • Aggregated net residential load (kW) • System load (MW) • Aggregated load curtailed (kW) • Aggregated discharge capacity (kW) (V2G)	• Value of load curtailed ($/kW, $/kWh) • Value of discharge capacity ($/kW, $/kWh) (V2G).	Customer charges as convenient (charging times will be compared with contingency to understand impact of uninfluenced charging)	None	Curtailment of EVSE or charge-discharge (V2G) in response to a contingency event to satisfy 10 minute operating reserve requirements	Avoided Generation & Capacity	Pilot 1/R2b
		Intermittent Renewable Generation Following Capability **EVSE4**	• Matching load/dispatch to renewable generation output (EVSE4)	• Curtailment of EVSE charge power (kW) by control of target charge rate • V2G discharge	• Connection Status & Alarm Status - The availability of EVSE for control during each test (including communication to the chargers, and the customer participation level) • EVSE monitoring signal latency (seconds) • EVSE control signal latency (seconds) • EVSE response time to target kW setpoint after receiving signal (seconds) • Expected and/or forecasted EVSE curtailment kW versus actual curtailment kW (%) • Available discharge power versus actual discharge power (%) measured for V2G	• Aggregated EV charger load (kW) • Aggregated load curtailed (kW) • Aggregated discharge capacity (kW) (V2G) • EVSE Control Variable Input: SGNS PV garden output (MW) • EVSE Control Variable Input: NSPI aggregated wind output (MW) or PV Farm output (MW)	• Marginal generation cost ($/MWh) • Value of load curtailed ($/kW, $/kWh) • Value of discharge capacity ($/kW, $/kWh) (V2G)	Customer charges as convenient (charging times will be compared with renewable output to understand impact of uninfluenced charging)	None	Curtailment of EVSE at specified levels until renewables output thresholds are met. V2G to leverage discharge capabilities	Renewable Integration Deferred T&D System Upgrades	Pilot 2/R3A
		Distribution Congestion Management **EVSE7**	• Maintaining feeder load under thresholds (EVSE7)	• Curtailment of EVSE charge power (kW) by control of target charge rate • V2G discharge	• Connection Status & Alarm Status - The availability of EVSE for control during each test (including communication to the chargers, and the customer participation level) • EVSE monitoring signal latency (seconds) • EVSE control signal latency (seconds) • EVSE response time to target kW setpoint after receiving signal (seconds) • Expected and/or forecasted EVSE curtailment kW versus actual curtailment kW (%). • Available discharge power versus actual discharge power (%) measured for V2G.	• Net residential load (kW) • EV charger load (kW) • EVSE Control Variable Input: Feeder Voltage (V), Current (A) and Load (MVA)	• Value of load curtailed ($/kW, $/kWh) • Value of discharge capacity ($/kW, $/kWh) (V2G)	Customer charges as convenient (charging impact on distribution congestion will be documented)	Utilize local EVSE settings, controls to achieve a scheduled curtailment or charge-discharge (V2G) schedule	Curtailment of EVSE at measured feeder load	Deferred Distribution System Upgrades	Pilot 2/R3A
		Cold Load Pickup Relief **EVSE6**	• Restoration Process (EVSE6)	• Curtailment of EVSE charge power (kW) by control of target charge rate • V2G discharge	• Time delay (response) between grid restoration and EVSE reinitiation of charging (Seconds). V2G to leverage discharge capabilities.	• Net residential load (kW) • EV charger load (kW) • Feeder Voltage (V), Current (A) and Load (MVA)	• Value of load curtailed ($/kW, $/kWh) • Value of discharge capacity ($/kW, $/kWh) (V2G)	Customer charges as convenient (document impact on load diversity and inrush current during restoration process)	Further leverage EVSE out-of-the-box functionality for delayed and staggered restoration of EVSE equipment	Targeted restoration of EVSE equipment	Deferred Distribution System Upgrades	Pilot 2/R3A
	EV V2G Chargers	**C&I Customer Demand Reduction** **EVSE9**	• Customer demand charge management	• V2G discharge during customer peak	• Connection Status & Alarm Status - The availability of EVSE for control during each test (including communication to the chargers, and the customer participation level) • EVSE monitoring signal latency (seconds) • EVSE control signal latency (seconds) • EVSE response time to target kW setpoint after receiving signal (seconds) • Expected and/or forecasted EVSE curtailment kW versus actual curtailment kW (%). • Available discharge power versus actual discharge power (%) measured for V2G.	• Net residential load (kW) • EV charger load (kW) • EVSE Control Variable Input: Feeder Voltage (V), Current (A) and Load (MVA)	• Value of load curtailed ($/kW, $/kWh) • Value of discharge capacity ($/kW, $/kWh) (V2G)	Customer charges as convenient (charging times will be compared to localized demand peaks at the site)	Utilize local EVSE settings, controls through vendor provided software to achieve a scheduled charge-discharge (V2G) schedule [note: this text was absent in the previous report in error]	N/A	Demand Charge Reduction	N/A
		Partial or Whole Home Backup **EVSE8**	• EVSE functionality for the customer during an outage	• V2G discharge	• Time delay of EVSE to provide partial home backup (Seconds)	• EV charger discharge power (kW) • System Average Interruption Duration Index (for the sample of customers enrolled in the Smart Grid NS Project) • System Average Interruption Frequency Index (for the sample of customers enrolled in the Smart Grid NS Project)	• Value of discharge capacity and energy ($/kW, $/kWh) • Value of Lost Load (VOLL) ($/kW)	EVSE V2G out-of-the-box operating mode	Notification to customers when outages may be forecasted so vehicles can be topped up manually via local control	Charge monitoring and control based on forecasted outages	Reliability	N/A
EV Telematics (ev.energy)	**EV Telematics (ev.energy)**	**Load Leveling (e.g. Peak Demand Reduction)** **EVSE1, 2, 3**	• Day-ahead generation planning (EVSE1) • Intra-day generation planning (EVSE2) • Time varying curtailment (EVSE3)	• Curtailment of EV charge power (kW) by control of charging timing	• Utility event statistics • Vehicle charging session data	• Energy delivered (kWh) • Unmanaged energy consumption (kWh)	• Value of load curtailed ($/kW, $/kWh)	Customer charges as convenient (charging times will be compared with system peaks to understand impact of uninfluenced charging)	EV charging patterns influenced by platform algorithim	EV Control based on: • Day-ahead generation planning • Intra-day generation planning • Time varying curtailment schedule	Economic Dispatch Avoided Generation & Capacity Deferred T&D System Upgrades	N/A
		Intermittent Renewable Generation Following Capability **EVSE4**	• Matching load/dispatch to renewable generation output	• Curtailment of EVSE charge power (kW) by control of charging timing	• Utility event statistics • Vehicle charging session data	• Energy delivered (kWh) • Unmanaged energy consumption (kWh)	• Value of load curtailed ($/kW, $/kWh)	Customer charges as convenient (charging times will be compared with system peaks to understand impact of uninfluenced charging)	EV charging patterns influenced by platform algorithim	Charging timing of EVSE shifted to times when renewables output forecast is optimal	Renewable Integration Deferred T&D System Upgrades	N/A
		Generation Contingency (10 Minute Operating Reserve) **EVSE5**	• Interruptible Rider to the Large Industrial Rate	• Curtailment of EV charge power (kW) by control of charging timing	• Utility event statistics • Vehicle charging session data	• Energy delivered (kWh) • Unmanaged energy consumption (kWh)	• Value of load curtailed ($/kW, $/kWh)	Customer charges as convenient (charging times will be compared with system peaks to understand impact of uninfluenced charging)	EV charging patterns influenced by platform algorithim	Curtailment of EV in response to a contingency event to satisfy 10 minute operating reserve requirements	Avoided Generation & Capacity	N/A

SGNS Customer Program Enrollment		Value to be Tested			Data and Metrics to Measure System Impact and Value			Project Scenarios for Comparison			Measuring Outcomes	ESP
DER Class	**DER Group**	**Value Streams**	**Processes Applicable to Value Streams**	**DER Control Variables Applied**	**Technical and Functional Data and Metrics**	**System Reliability and Grid Stability Data and Metrics**	**Reduced Upward Pressure on Revenue Requirements Data and Metrics**	**Baseline Scenario** No utility influenced control	**Baseline Scenario 2** Device-level control	**Test Scenario** Direct Utility Control	**Customer Benefit**	**Software Release**
Battery Energy Storage Systems and Smart Inverters	**Residential Battery Storage** **&** **C&I Batteries**	**Load Leveling (e.g. Peak Demand Reduction)** **SV1, 2, 3** **PW1, 2, 3**	• Day-ahead generation planning (SV1, PW1) • Intra-day generation planning (SV2, PW2) • Time varying charging and discharging schedule (SV3, PW3)	• Charge and discharge of batteries by control of target charge and discharge rates (kW)	• Connection Status & Alarm Status - The availability of batteries for control during each test (including communication to the batteries, and the customer participation level) • Battery monitoring signal latency (seconds) • Battery control signal latency (seconds) • Battery response times to target kW and/or kWh setpoints after receiving signal (Seconds) • Expected and/or forecasted battery charge and discharge power (kW) and energy (kWh) versus actuals (%)	• Aggregated net residential/commercial load (kW) • System load (MW) • Aggregated Battery charge and discharge capacity (kW)	• Marginal generation cost ($/MWh) • Value of Battery charge and discharge capacity and energy ($/kW, $/kWh)	Uninfluenced battery charge and discharge (can help forecast potential increasing impact on system peak)	Use device settings to apply charge-discharge schedule	Charge and discharge control based on: • Day-ahead generation planning • Intra-day generation planning • Time varying charging and discharging schedule	Economic Dispatch Avoided Generation & Capacity Deferred T&D System Upgrades	Pilot 2/R3A
		Generation Contingency (10 Minute Operating Reserve) **SV5** **PW5**	• Interruptible Rider to the Large Industrial Rate	• Charge and discharge of batteries by control of target charge and discharge rates (kW)	• Connection Status & Alarm Status - The availability of batteries for control during each test (including communication to the batteries, and the customer participation level) • Battery monitoring signal latency (seconds). • Battery control signal latency (seconds) • Battery response times to target kW and/or kWh setpoints after receiving signal (Seconds) • Expected and/or forecasted battery charge and discharge power (kW) and energy (kWh) versus actuals (%)	• Aggregated net residential/commercial load (kW) • System load (MW) • Aggregated Battery charge and discharge capacity (kW)	• Value of Battery charge and discharge capacity and energy ($/kW, $/kWh).	Uninfluenced battery charge and discharge (can help forecast potential increasing impact on reserves)	None	Discharge in response to a contingency event to satisfy 10 minute operating reserve requirements	Avoided Generation & Capacity	Pilot 2/R3A
		Intermittent Renewable Generation Following Capability **SV4** **PW4**	• Matching load/dispatch to renewable generation output	• Charge and discharge of batteries by control of target charge and discharge rates (kW) and/or ramp rates (kW/min)	• Connection Status & Alarm Status - The availability of batteries for control during each test (including communication to the batteries, and the customer participation level) • Battery monitoring signal latency (seconds) • Battery control signal latency (seconds) • Battery response times to target kW and/or kWh setpoints after receiving signal (seconds) • Expected and/or forecasted Battery charge and discharge power (kW) and energy (kWh) versus actuals (%) • Battery charge and discharge ramp rate resolution (incremental kW) and response delay (control signal and battery target kW response: Seconds) in response to wind or PV signal (MW thresholds)	• Aggregated battery charge and discharge capacity (kW) • Battery Control Variable Input: SGNS PV garden output (MW) • Battery Control Variable Input: NSPI aggregated wind output (MW) or PV Farm output (MW)	• Marginal generation cost ($/MWh) • Value of Battery charge and discharge capacity and energy ($/kW, $/kWh)	Uninfluenced battery charge and discharge	None	Charge and discharge at specified levels based on renewables generation output thresholds	Renewable Integration Deferred T&D System Upgrades	Pilot 2/R3B
		Distribution Congestion Management **SV7** **PW7**	• Maintaining feeder load within thresholds (SV7, PW7)	• Charge and discharge of batteries by control of target charge and discharge rates (kW)	• Connection Status & Alarm Status - The availability of batteries for control during each test (including communication to the batteries, and the customer participation level) • Battery monitoring signal latency (seconds) • Battery control signal latency (seconds) • Battery response times to target kW and/or kWh setpoints after receiving signal (Seconds) • Expected and/or forecasted battery charge and discharge power (kW) and energy (kWh) versus actuals (%)	• Net residential/commercial load (kW) • Battery discharge power (kW) • Battery Control Variable Input: Feeder Voltage (V), Current (A) and Load (MVA)	• Value of Battery discharge capacity and energy ($/kW, $/kWh)	Uninfluenced battery charge and discharge (can help forecast potential increasing impact on distribution congestion)	Use device settings to apply charge-discharge schedule	Discharge at measured feeder load	Deferred Distribution System Upgrades	Pilot 2/R3B
		Cold Load Pickup Relief **SV6** **PW6**	• Restoration Process	• Charge and discharge of batteries by control of target charge and discharge rates (kW)	• Time delay (response) between grid restoration and battery initiation of charge and/or discharge (Seconds).	• Aggregated net residential/commercial load (kW) • Battery discharge power (kW) • Feeder Voltage (V), Current (A) and Load (MVA)	• Value of Battery charge and discharge capacity and energy ($/kW, $/kWh)	Uninfluenced battery charge and discharge (document impact on load diversity and inrush current during restoration process)	Further leverage battery out-of-the-box functionality for delayed and staggered charging, and/or fast response discharging	Targeted charge and discharge to support restoration process	Deferred Distribution System Upgrades	Pilot 2/R3B
		Partial Home or Critical Load Backup **SV8** **PW8**	• Battery functionality for the customer during outages	• Discharge of batteries to provide partial home backup	• Time delay of batteries to provide partial home backup (Seconds)	• Battery discharge power (kW) • System Average Interruption Duration Index (for the sample of customers enrolled in the Smart Grid NS Project) • System Average Interruption Duration Index (for the sample of customers enrolled in the Smart Grid NS Project)	• Value of battery discharge capacity and energy ($/kW, $/kWh) • Value of Lost Load (VOLL) ($/kW)	Battery out-of-the-box operating mode (default 20% state-of-charge reserved for backup)	Notification to customers when outages may be forecasted so batteries can be topped up manually via local control	Utility monitoring and control of battery top-up to provide back up power	Reliability	Pilot 2/R3A
	C&I Batteries	**C&I Power Factor Correction (Power Quality)**	• Battery functionality for the customer	• Target Power Factor: Inject and/or absorb reactive power to achieve power factor set-point.	• Connection Status & Alarm Status - The availability of batteries for control during each test (including communication to the batteries, and the customer participation level) • Battery monitoring signal latency (seconds) • Battery control signal latency (seconds) • Battery response times to target PF setpoint after receiving signal (seconds) • Target PF setpoint versus actual PF measured (%)	• Feeder Voltage (V), Current (A) and Load (MVA) • Battery Real Power (kW) • Battery Reactive Power (kVAR) • Customer Power Factor (%) • Customer Voltage (V) • Customer Demand (kVA) • Feeder Power Factor (%)	• Value of Lost Load (VOLL) ($/kW)	Battery out-of-the-box operating mode	None	Manage optimal control strategy for power factor correction i.e. determine when needed most by the C&I site while value-stacking with other use-cases	Power Quality	Pilot 2/R3B
		C&I Increased Solar Self Consumption	• Battery functionality for the customer	• Charge and discharge of batteries by control of target charge and discharge rates (kW) based on solar PV production forecasts	• Connection Status & Alarm Status - The availability of Batteries for control during each test (including communication to the batteries, and the customer participation level) • Battery monitoring signal latency of (milliseconds) • Battery control signal latency (milliseconds) • Battery response times to target kW and/or kWh setpoints after receiving signal (Seconds) • Expected and/or forecasted Battery charge and discharge power (kW) and energy (kWh) versus actuals (%) • Forecasted PV Output (kW) and energy (kWh) versus actuals (%)	• Net commercial load (kW) • Battery charge and discharge power (kW) • Forecasted PV Output (kW) • Actual PV Output (kW)	• Value of battery discharge capacity ($/kW)	Battery out-of-the-box operating mode	None	Manage optimal control strategy for C&I increased solar self consumption i.e. determine when needed most by the C&I site while value-stacking with other use-cases	Renewable Integration	Pilot 2/R3B
		Voltage Support	• PV Inverter grid support functionality	• Volt-VAR or Volt-Watt modes: Reactive power or real power response to feeder voltages falling outside of nominal range	• Connection Status & Alarm Status - The availability of PV Inverters for control during each test (including communication to the PV Inverters, and the customer participation level) • PV Inverter monitoring signal latency (seconds) • PV Inverter control signal latency (seconds) • Forecasted PV Output (kW) and energy (kWh) versus actuals (%) • PV Inverter response time to setpoint real power (kW) after receiving signal (Seconds) • PV Inverter response time to setpoint reactive power (kW) after receiving signal (Seconds) • System response time (Seconds) to specified voltage or nominal voltage range • Target real power setpoint versus actual real power setpoint measured (%) • Target reactive power setpoint versus actual reactive power setpoint measured (%)	• Feeder Voltage (V), Current (A) and Load (MVA) • PV Inverter Real Power Output (kW) • PV Inverter Reactive Power Output (kVAR) • Feeder Power Factor (%) • PV Inverter Control Variable Input: Feeder Voltage (V)	• Value of PV inverter real and reactive power output and energy ($/kW, $/kWh, $/kVAR, $/kVARh) • Value of Lost Load (VOLL) ($/kW)	PV Inverter out-of-the-box operating modes	None	Manage optimal control schedule for voltage support while value-stacking with other grid services in the time domain	Deferred Distribution System Upgrades Power Quality	Pilot 2/R3B

SGNS Customer Program Enrollment		Value to be Tested			Data and Metrics to Measure System Impact and Value			Project Scenarios for Comparison			Measuring Outcomes	ESP
DER Class	**DER Group**	**Value Streams**	**Processes Applicable to Value Streams**	**DER Control Variables Applied**	**Technical and Functional Data and Metrics**	**System Reliability and Grid Stability Data and Metrics**	**Reduced Upward Pressure on Revenue Requirements Data and Metrics**	**Baseline Scenario** No utility influenced control	**Baseline Scenario 2** Device-level control	**Test Scenario** Direct Utility Control	**Customer Benefit**	**Software Release**
Solar PV Smart Inverters	**Community Solar PV** **&** **C&I Solar PV**	**Frequency Response**	• PV Inverter grid support functionality	• Frequency-Watt mode: Real power response to system frequency falling outside of nominal range or specified value	• Connection Status & Alarm Status - The availability of PV Inverters for control during each test (including communication to the PV Inverters, and the customer participation level) • PV Inverter monitoring signal latency of (seconds) • PV Inverter control signal latency (seconds) • Forecasted PV Output (kW) and energy (kWh) versus actuals (%) • PV Inverter response time to setpoint real power (kW) after receiving signal (Seconds) • System response time (seconds) to specified frequency or nominal frequency range • Target real power setpoint versus actual real power setpoint measured (%)	• Feeder Voltage (V), Current (A) and Load (MVA) • PV Inverter Real Power Output (kW) • Feeder Power Factor (%) • PV Inverter Control Variable Input: Feeder Frequency (Hz)	• Value of PV inverter real power output and energy ($/kW, $/kWh)	PV Inverter out-of-the-box operating modes	None	Manage optimal control schedule for frequency response while value-stacking with other grid services in the time domain	Avoided Generation & Capacity	Pilot 2/R3B
		Feeder Power Factor Correction (Power Quality)	• PV Inverter grid support functionality	• Target Power Factor: Inject and/or absorb reactive power to achieve power factor set-point.	• Connection Status & Alarm Status - The availability of PV Inverters for control during each test (including communication to the PV Inverters, and the customer participation level) • PV Inverter monitoring signal latency of (seconds) • PV Inverter control signal latency (seconds) • Forecasted PV Output (kW) and energy (kWh) versus actuals (%) • PV Inverter response times to target PF setpoint after receiving signal (Seconds) • Target PF setpoint versus actual PF measured (%)	• Feeder Voltage (V), Current (A) and Load (MVA) • PV Inverter Real Power Output (kW) • PV Inverter Reactive Power Output (kVAR) • Feeder Power Factor (%)	• Value of PV inverter real and reactive power output and energy ($/kW, $/kWh, $/kVAR, $/kVARh) • Value of Lost Load (VOLL) ($/kW)	PV Inverter out-of-the-box operating modes	None	Manage optimal control schedule for power factor correction while value-stacking with other grid services in the time domain	Deferred Distribution System Upgrades Power Quality	Pilot 2/R3B
	C&I Solar PV	**C&I Power Factor Correction (Power Quality)**	• PV Inverter functionality for the customer	• Target Power Factor: Inject and/or absorb reactive power to achieve power factor set-point.	• Connection Status & Alarm Status - The availability of PV Inverters for control during each test (including communication to the PV Inverters, and the customer participation level) • PV Inverter monitoring signal latency of (seconds) • PV Inverter control signal latency (seconds) • Forecasted PV Output (kW) and energy (kWh) versus actuals (%) • PV Inverter response times to target PF setpoint after receiving signal (Seconds) • Target PF setpoint versus actual PF measured (%)	• Feeder Voltage (V), Current (A) and Load (MVA) • PV Inverter Real Power Output (kW) • PV Inverter Reactive Power Output (kVAR) • Feeder Power Factor (%) • Customer Power Factor (%) • Customer Voltage (V) • Customer Demand (kVA)	• Value of PV inverter real and reactive power output and energy ($/kW, $/kWh, $/kVAR, $/kVARh) • Value of Lost Load (VOLL) ($/kW)	PV Inverter out-of-the-box operating modes	None	Manage optimal control strategy for power factor correction i.e. coordinate with concurrent C&I battery inverter value streams and services to supplement C&I value	Power Quality	Pilot 2/R3B
Building Management Systems	**C&I BMS**	**Load Leveling (e.g. Peak Demand Reduction)** **BMS 1, 2, 3**	• Day-ahead generation planning (BMS1) • Intra-day generation planning (BMS2) • Time varying curtailment or (BMS3)	• Curtailment of controlled equipment though various actions (e.g. decreased temperature or dP setpoints, turn off)	• Connection Status & Alarm Status - The availability of BMS for control during each test (including communication to BMS, and the customer participation level) • BMS monitoring signal latency (seconds) • BMS control signal latency (seconds) • BMS response time to curtailment after receiving signal (seconds)	• Aggregated controlled load (kW) • Net customer load (kW) • System load (MW) • Aggregated load curtailed (kW)	• Marginal generation cost ($/MWh) • Value of load curtailed ($/kW, $/kWh)	Customer runs equipment as convenient (load profile will be compared with system peaks to understand impact of uninfluenced operation)	None	Equipment control based on: • Day-ahead generation planning • Intra-day generation planning • Time varying curtailment schedule	Economic Dispatch Avoided Generation & Capacity Deferred T&D System Upgrades	Pilot 2/R3C
		Generation Contingency (10 Minute Operating Reserve) **BMS5**	• Interruptible Rider to the Large Industrial Rate (BMS5)	• Curtailment of controlled equipment though various actions (e.g. decreased temperature or dP setpoints, turn off)	• Connection Status & Alarm Status - The availability of BMS for control during each test (including communication to BMS, and the customer participation level) • BMS monitoring signal latency (seconds) • BMS control signal latency (seconds) • BMS response time to curtailment after receiving signal (seconds)	• Aggregated controlled load (kW) • Net customer load (kW) • System load (MW) • Aggregated load curtailed (kW)	• Marginal generation cost ($/MWh) • Value of load curtailed ($/kW, $/kWh)	Customer runs equipment as convenient (load profile will be compared with system peaks to understand impact of uninfluenced operation)	None	Curtailment of equipment in response to a contingency event to satisfy 10 minute operating reserve requirements	Avoided Generation & Capacity	Pilot 2/R3C
		Critical Peak Reduction **BMS10**	• Critical Peak Pricing (BMS10)	• Curtailment of controlled equipment though various actions (e.g. decreased temperature or dP setpoints, turn off)	• Connection Status & Alarm Status - The availability of BMS for control during each test (including communication to BMS, and the customer participation level) • BMS monitoring signal latency (seconds) • BMS control signal latency (seconds) • BMS response time to curtailment after receiving signal (seconds)	• Aggregated controlled load (kW) • Net customer load (kW) • System load (MW) • Aggregated load curtailed (kW)	• Marginal generation cost ($/MWh) • Value of load curtailed ($/kW, $/kWh)	Customer runs equipment as convenient (load profile will be compared with system peaks to understand impact of uninfluenced operation)	None	Curtailment of equipment in response to a day-ahead Critical Peak event being called in order to reduce a period of high demand	Avoided Generation & Capacity	Pilot 2/R3C

SOLAR GARDEN SPECIFIC METRICS

INTRODUCTION

Pursuant to Board's direction in its Decision regarding the Solar Garden Rate Rider, the Company provides Solar Garden specific metrics in this attachment.

The Community Solar Garden metrics are reported for both the current reporting period (i.e. July 1 to December 31, 2022, inclusive) and cumulatively – inclusive of the previous period (i.e. February 1 to June 30, 2022. Commissioning of the Community Solar Garden was completed on January 30, 2022 and energy production began for customers on February 1, 2022.

SOLAR GARDEN SPECIFIC METRICS

Generation by Month

Table 1 – Generation by Month

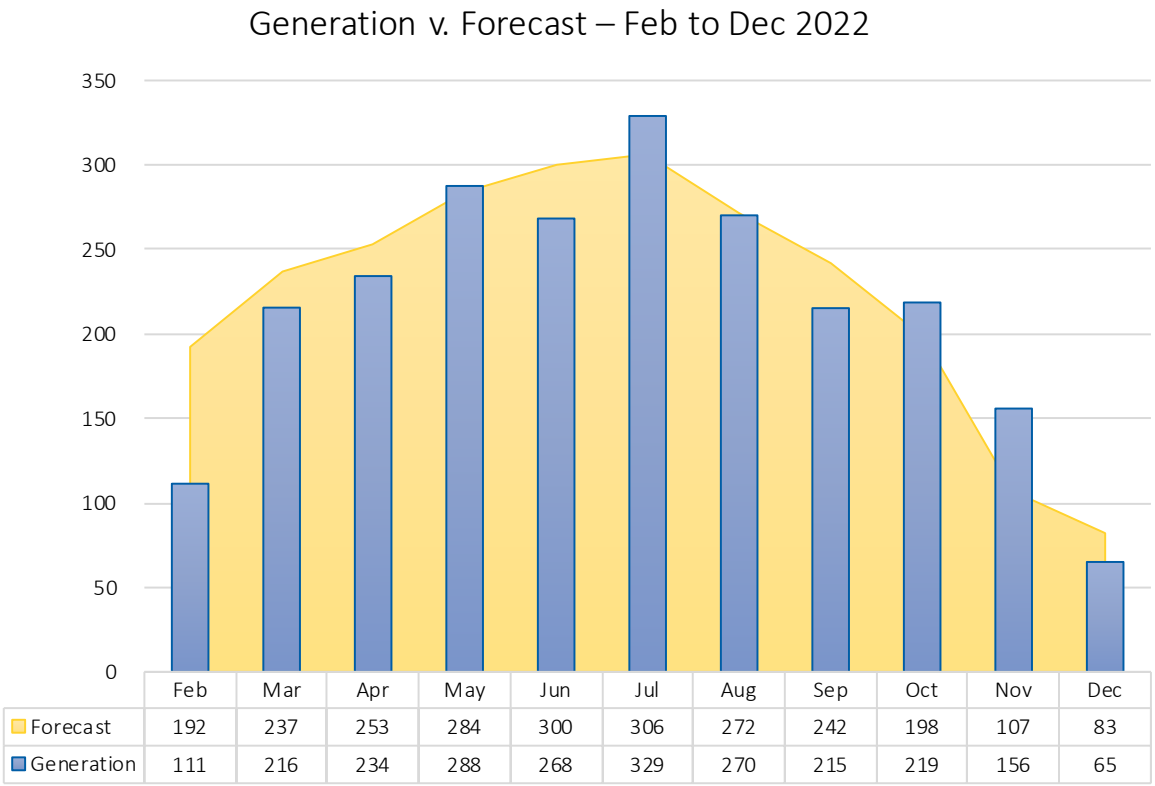
Month	Generation (MWh)
Feb	107.556
Mar	212.167
Apr	232.024
May	285.827
Jun	266.916
Jul	327.865
Aug	268.985
Sep	214.135
Oct	217.054
Nov	154.166
Dec	62.840
Total	2,349.535

Annual Generation Compared to Forecast Generation

Year-to-date (i.e. February 1 to December 31, 2022) –

- generation totaled 2,349.5 MWh
- forecast was 2,474.0 MWh
- deviation from forecast was -5.0%

Figure 1 – Year-to-Date Generation compared to Forecast

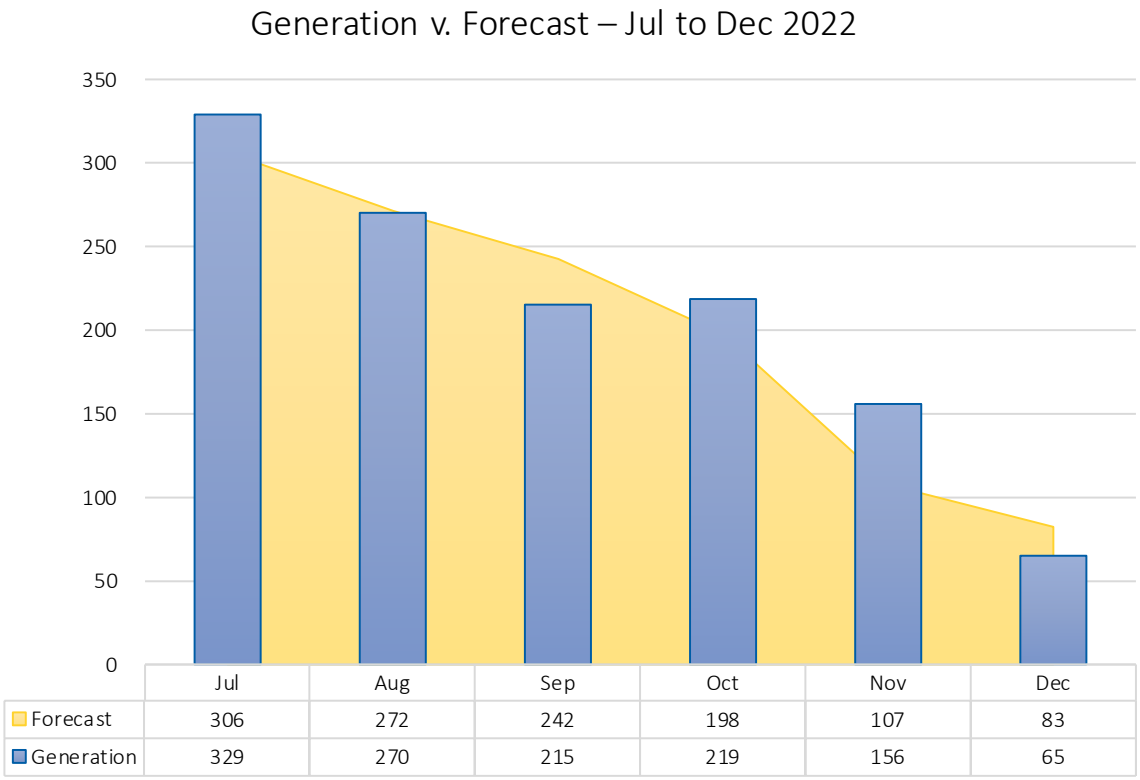


	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Forecast	192	237	253	284	300	306	272	242	198	107	83
Generation	111	216	234	288	268	329	270	215	219	156	65

In the current reporting period (i.e. July 1 to December 31, 2022) –

- generation totaled 1,254.0 MWh
- forecast was 1,207.8 MWh
- deviation from forecast was +3.1%

Figure 2 – Generation compared to Forecast for the Current Reporting Period



System Outages

Outage Event – June 28 to July 1, 2022

A total outage caused by a failed protection component at the Community Solar Garden beginning around 11:00 on the morning of June 28 extended to about 12:00 on July 1. Solar production was limited to approximately 90% on July 1.

Outage Event – July 12 to 13, 2022

A total outage caused by a transmission outage in the area beginning around 11:30 on the morning of July 12. Power was restored at the Community Solar Garden before 06:30 on July 13. Solar production on July 12 was limited to approximately 25% of normal production, and minimally impacted on the morning of July 13.

Outage Event – July 24 to 25, 2022

A total outage caused by a power imbalance on the circuit connecting the Community Solar Garden beginning around 21:30 on July 24. Power was restored by 09:00 on July 25. Solar production was not impacted on July 24 and was limited to approximately 70% on July 25.

Outage Event – September 24 to 29, 2022

Full system outage beginning at 01:35 on September 24 was caused by a severe storm event that resulted in damage to some solar modules and loosened or damaged pieces of the mechanical balance of systems. The main electrical infrastructure remained unharmed; however, the damage to components of the system resulted in 108 hours of system downtime.

The system returned to partial operation (66%) once the grid was restored at 13:00 on September 28; the system was restored to full power capacity around 13:40 on September 30. Solar production was monitored ahead of September 30 to ensure that the system repairs were ready for commercial generation, as solar production for subscribers is forecasted assuming the operation of the total system power capacity installed.

The outage brought net solar production in the month of September 10% below target; an estimated 24 MWh of production was not realized.

All fees were waived during the period of September 24 to 29, 2022.

Annual Maintenance Event – October 24, 2022

Annual maintenance was performed on October 24; therefore, production was near zero on this day. Maintenance outages are calculated into expected annual performance. The work to repair the CT that cause the prolonged outage at the end of June was completed during this maintenance event.

Outage Event – December 1 to 2, 2022

There was a total outage at the solar garden on December 1 due to a grid outage in Amherst following an overnight wind and rainstorm. Power was restored shortly before 10:00 on December 1, limiting most production loss to the early morning hours; however, 10% of the capacity remained off for the entire day and was restored before production began on December 2.

Outage Event – December 24 to 25, 2022

There was a total outage at the solar garden on December 24 and 25 due to a grid outage in Amherst related to a severe winter storm event in the area. Generation being restored in advance of production on December 26, 2022.

Monthly Program Enrolment (number of participants and subscribed capacity) and Low-Income Participation

Table 2 – Number of Participants by Month

Month	Subscribed	Unsubscribed	Monthly Net Total	Cumulative Subscriber Base
Feb	43	–	43	43
Ma	86	1	85	128

Month	Subscribed	Unsubscribed	Monthly Net Total	Cumulative Subscriber Base
Apr	12	–	12	140
May	8	1	7	147
Jun	20	1	19	166
Jul	9	–	9	175
Aug	2	1	1	176
Sep	1	4	(3)	173
Oct	2	–	2	175
Nov	–	2	(2)	173
Dec	1	–	1	174
Total	184	10	174	–

Table 3 – Subscriber Capacity (kW) Metrics, by Month

Month	Capacity (kW)					
	New	Increased	Decreased	Unsubscribed	Monthly Net Total	Cumulative Subscribed
Feb	270.00	–	–	–	270.00	270.00
Mar	536.50	–	–	(5.00)	531.50	801.50
Apr	76.50	27.25	–	–	103.75	905.25
May	73.00	22.00	–	(9.00)	86.00	991.25
Jun	166.25	–	–	(4.00)	162.50	1,153.75
Jul	48.75	2.25	–	–	51.00	1,204.75
Aug	20.00	3.50	–	(8.00)	15.50	1,220.25
Sep	7.25	2.25	–	(24.00)	(14.50)	1,205.75
Oct	22.50	–	–	–	22.50	1,228.25
Nov	–	–	–	(7.50)	(7.50)	1,220.75
Dec	3.50	3.75	–	–	7.25	1,228.00
Total	1,224.50	61.00	–	(57.50)	1,228.00	–

NS Power relies on customers to self-identify as low income. No subscribers have identified themselves as low income. NS Power is otherwise unable to discern the level of low-income participation.

Estimated Average Participant Bill Impacts by Class

Year-to-Date Estimated Average Participant Bill Impacts by Class, in dollars:

- Residential Average Monthly Community Solar Bill Impact = +$3.79 / month (cost)
- Commercial Average Monthly Community Solar Bill Impact = +$22.02 / month (cost) [1]

Current Reporting Period Estimated Average Participant Bill Impacts by Class, in dollars:

- Residential Average Monthly Community Solar Bill Impact = +$9.35 / month (cost)
- Commercial Average Monthly Community Solar Bill Impact = +$24.56 / month (cost) [2]

Estimated Cumulative Benefits to Participants and Non-Participants

Table 4 – Current Period, and Year-to-Date, Estimated Cumulative Benefits (Participants and Non-Participants)

	Value (in dollars)	
	Current Period	Year-to-Date
Fees collected	48,384.53	73,602.70
Credits disbursed	41,848.50	67,059.70
Cumulative net benefit/(cost) shared by subscribers	(6,536.08)	(6,543.01)
Maximum theoretical revenue from full subscription	82,402.32	151,070.92
Revenue gap (Max theoretical – fees collected)	34,017.79	77,468.22
Maximum value of energy produced	69,759.87	131,644.45
Value to non-subscribers (Max value of energy – credits disbursed)	27,911.42	64,584.76
Cumulative net benefit/(cost) to non-subscribers	(6,106.37)	(12,883.46)

As noted in NS Power's Solar Garden Rate Rider Reply Evidence, "… the Company designed the Rate Rider charge to reflect the "all in" costs of the Solar Garden, including capital and OM&G, such that subscribing customers' payments would offset and eventually fully pay down the costs of the Solar Garden over the life of the assets assuming full subscribership." [3] The Solar Garden sold out of residential capacity during the reporting period, but commercial capacity remains available. Given the Solar Garden is not yet fully subscribed, a net cost to non-subscribers during this reporting period was expected. Marketing and recruitment efforts will continue in 2023 with a focus on filling subscriptions reserved for commercial rate classes.

Total Generation and Average Generation per kW for Each of the Past 12 Months

Table 5 – Total Generation and Average Generation per kW for Each of the Past 12 Months

Month	Net Generation (MWh)	Generation per kW (kWh / kWp)
Feb	107.556	53.724

[1] This average is based on the one commercial customer that subscribes to the Solar Garden.
[2] This average is based on the one commercial customer that subscribes to the Solar Garden.
[3] NS Power Reply Evidence, M10176 - Solar Garden Rate Rider, September 29, 2021, page 11 of 16, lines 1 to 4.

Month	Net Generation (MWh)	Generation per kW (kWh / kWp)
Mar	212.167	105.978
Apr	232.024	115.896
May	285.827	142.771
Jun	266.916	133.325
Jul	327.865	163.769
Aug	268.985	134.358
Sep	214.135	106.961
Oct	217.054	108.419
Nov	154.166	77.006
Dec	62.840	31.389
Total	2,349.535	1,173.594

Details About Equipment Outages or Replacements Affecting Solar Garden Output

Please refer to System Outages section, above.

Forecasts of Annual Generation per kW for Each of the Next 5 Years

Table 6 – Forecasts of Annual Generation per kW for Each of the Next 5 Years

Year	Annual Generation (kWh/kWp)
2023	1,305
2024	1,300
2025	1,294
2026	1,289
2027	1,284

SGNS Project Lessons Learned

January 31, 2023

SGNS PROJECT LESSONS LEARNED

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INTRODUCTION

The purpose of the Smart Grid Nova Scotia (SGNS) Project is to gather data and learnings regarding the potential customer and system benefits of Distributed Energy Resource Management Systems (DERMS) and control of Distributed Energy Resources (DERs). Data and learnings are being pursued through various use cases, noted in the Project's Compliance Filing, and as updated in the semi-annual reports. Some learnings fall outside of the strict data and metrics prescribed by the use case; those learnings are summarized in this document and are cumulative – covering all Project reporting periods.

PROJECT LESSONS LEARNED TO DATE

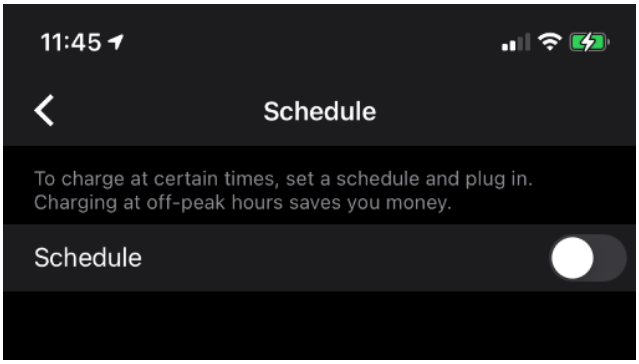
1. ChargePoint USA/Canadian Accounts

Some customer participants who had ChargePoint accounts created prior to June 2019 had data stored on a USA server instance, which prevented data collection by the Canadian ChargePoint utility dashboard used by the Project. This was rectified with a communication to the affected customers and support from ChargePoint to move all participant data to the Canadian ChargePoint server.

2. ChargePoint Customer App Default Language

The ChargePoint app default notifications can mislead users to believe they are registered into a time-of-day (TOD) tariff, as illustrated in Figure 1. This is not the case unless the customer was previously subscribed to the NS Power TOD rate.

Figure 1 – Screenshot of the ChargePoint App Setting Indicating that Off-Peak Charging will Save the Participant Money

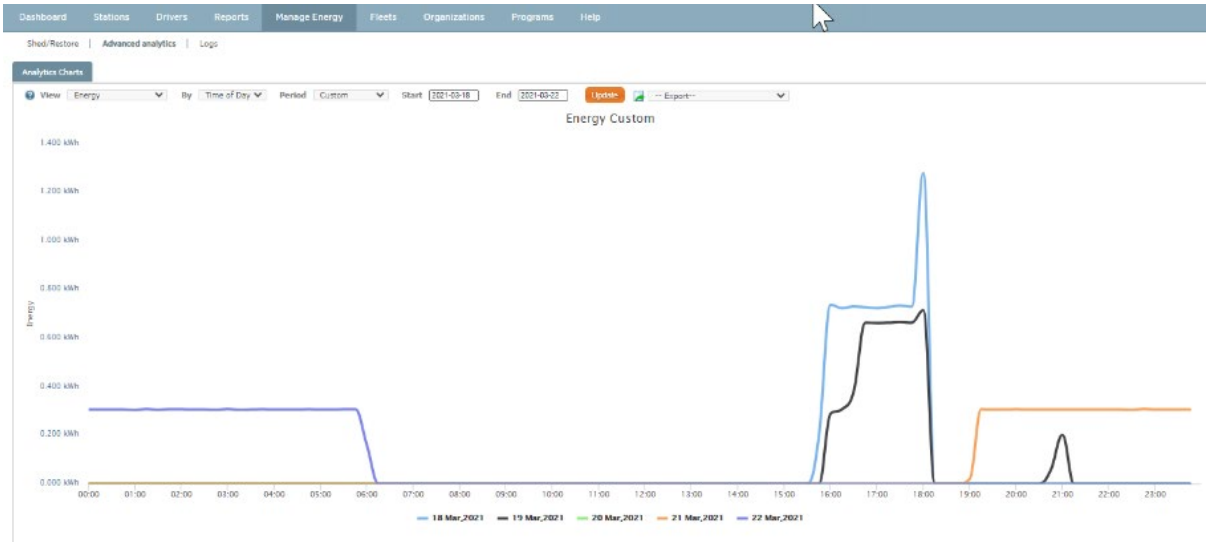


3. Tesla EV 'Unexpected Fluctuation' Behaviour

It was found that Tesla electric vehicles (EV) are forced into a low charging power mode by the vehicle if the input power fluctuates when the charger curtails vehicle charging below 50%.[1] This means that Tesla vehicles offer less controllable capacity to the utility until further testing can be done. Figure 2 shows the ChargePoint dashboard depicting Tesla EV behaviour.

[1] Fifty percent is approximate, testing is ongoing to determine this power level more specifically, as well as to determine if 0 kW curtailment is possible.

Figure 2 – ChargePoint Dashboard Depicting Tesla Vehicle Behaviour



The curtailment of charging at 18:00, shown by the blue and black lines, triggered the vehicle to go into a reduced and steady charging state, shown by the orange and purple lines. In this state, the vehicle will only charge at 25% of its maximum charging level until the driver/customer manually resets it.

To address this issue, NS Power has deployed an alternative EV charging management system, *ev.energy*, as first described in the July 2022 semi-annual report.

4. OpenADR Standard Implementation

Experience to date with the implementation of OpenADR, a standard protocol for technology integrations, is that the widely used standard still requires customization that can vary with each integration. This is an important learning when considering resourcing, scheduling, and collaborating efforts with project partners. The project will also be comparing the OpenADR integration directly to a vendor application programming interface (API) integration, [2] from both an effort and value perspective in future reports.

Industry standards are changing and evolving as the industry matures. Manufacturers have implemented customized integrations that align with different evolving standards (e.g. OpenADR, IEEE2030.5). When contracting for integration services, it is important to ensure that all vendors understand and agree on the integration architecture and standards when providing estimates. Once the architecture and standards are committed, detailed design sessions are required to optimize the time spent developing and testing the integrations.

[2] The Sunverge batteries use an OpenADR integration, while the Tesla batteries use an API integration.

5. ChargePoint Warranty

It was observed that approximately 20 percent of the 100 installed ChargePoint chargers experienced defects after installation and commissioning. NS Power and ChargePoint are working together on resolving the issues, which includes replacing many of the affected chargers known to have defects. These devices are covered under ChargePoint's warranty.

Future programs that include utility-owned distributed equipment should, where possible, include warranty considerations that include the contractor labour to replace these units in addition to the standard parts-only warranty.

In the July to December 2022 reporting period, the failure rate rose more than 35 percent and some users experienced failures on replaced units. ChargePoint's warranty continues to cover the defect, which ChargePoint has acknowledged as a widespread issue affecting the Wi-Fi module in the ChargePoint HomeFlex product. Other utility programs in North America have been affected as well. ChargePoint has attempted to mitigate the issue with successive software updates across the fleet of installed devices. As previously reported, consideration for purchasing a labour warranty remains valid but is not necessarily applicable with respect to mass failures as the result of abnormal defect rates.

6. Energy System Platform (ESP) Administration

As customer enrollment and needs change based on individual situations and programming requirements, updates to ESP asset connections requires administrative attention. Maintaining the records and information within multiple vendor systems requires greater effort that originally anticipated, due in part to the ChargePoint hardware defect rate attributed to the Wi-Fi module failure.

Consideration of integration to an asset management and/or customer management platform should be given for future planning as well as adequate resources for administration and operation.

7. Data & Reporting

Efficient data reporting is important at all stages of an innovation project. The ESP data reporting is not fully functional. Most of the energy data available for analysis of electric vehicle supply equipment (EVSE) baseline and events is sourced directly from ChargePoint, Sunverge, and directly from the vendor's site for other assets. As assets and systems become fully integrated into the ESP environment and development continues, the reporting and analysis functionality in ESP is expected to become more functional. Until ESP asset integration is complete, the project team continues to leverage available data from the asset platforms to compile and analyze.

In the current reporting period, the project team worked through testing to export data to a shared SFTP site for NS Power consumption. This was setup for the test environment; the team continues work with Siemens to export data for all assets daily, as they become available in ESP. The project team is working with the internal Business Intelligence and Analytics team to explore data warehousing, integration, and

scheduled jobs to consume data from the SFTP site. The project team continues to explore deeper analysis methods to ensure insights related to all hypotheses are captured.

In the July to December 2022 period, the project team leveraged Tableau to analyze data from Sunverge's full database for reporting. Tableau tools supported enhanced analytics and reporting to develop this report. Over the first and second quarters of 2023, the team will integrate other data sources and system data to enhance insights and reporting. Standard reporting and time interval requirements must be part of the initial business requirements as other data sources such as APIs, databases, and portal exports, are integrated.

8. Addition of Solar to Homes with Residential Batteries

Despite terms outlined in customer agreements, which require pilot participants to notify NS Power of any modifications that may affect the battery system, some residential battery customers subsequently installed solar systems without notifying NS Power. In some cases, this created a safety risk of overloading the busbar. The project team identified these installations and supported these customers with education to ensuring proper recommissioning with solar PV. The project team has setup processes to continue to identify any installations that are not identified to the team in advance by the customer or their chosen solar installer.

9. Opportunity to Discharge Batteries to Homes with Solar Arrays

Solar photovoltaics (PV) effectively reduces the load on the house when it is producing energy. Since the batteries are not configured to export to the grid, reducing load on the home limits the time in which there is an opportunity to discharge the battery to the home. NS Power will monitor baseline data to further understand the impact on the use cases.

Some homes connect solar installations to the meter base, which does not affect the load on the home; therefore, the issue is not expected to be relevant in this case. NS Power is able to identify homes in each of the two scenarios (i.e. homes connected at the meter base and home connected behind-the-meter) in the pilot.

10. Tesla Powerwall Frequency Power Control Interrupting Customer UPS

Under off-grid conditions, when near full capacity, the Powerwall will output 66Hz frequency to shutoff solar inverters to avoid overcharging the battery. This is true when solar is present at the installed location and is the default setting. This can only be adjusted by Tesla remotely – not the installer. Generally, uninterruptible power supply (UPS) systems operate outside of this frequency and will also be shutoff. Tesla can adjust the frequency output remotely to avoid this. Two customers have reported this issue. This issue has been resolved for the two customers who reported the issue, and a solution identified for future customers.

11. Bell APN Connectivity to Sunverge Devices

This private network communication path to the residential battery devices created communications issues and excessive latency with cellular modems which impacted remote firmware updates. As security reviews of Sunverge and Siemens ESP systems were deemed acceptable by a NS Power information technology (IT) security risk assessment, these devices were transitioned to the public cellular network and improved performance has been observed on the fleet.

12. Tesla Powerwall Frequency Power Control Interrupting Customer UPS

Under off-grid conditions, when near full capacity, the Powerwall will output 66Hz frequency to shutoff solar inverters to avoid overcharging the battery. This is true when solar is present at the installed location and is the default setting. This can only be adjusted by Tesla remotely – not the installer. Generally, uninterruptible power supply (UPS) systems operate outside of this frequency and will also be shutoff. Tesla can adjust the frequency output remotely to avoid this. Two customers have reported this issue. This issue has been resolved for the two customers who reported the issue, and a solution identified for future customers.

13. Canadian Electrical Code Change – Acceptable Locations for Residential Batteries

In January 2021, an updated version of the Canadian Electrical Code (the 'Code') was issued with updates to rules that govern the acceptable locations for battery storage systems. Nova Scotia's Electrical Code Regulations requires that amendments, supplements, and/or additions to the Code are adopted on the first day of the fourth month[3] following Code publication – i.e. by May 2021.

At the time of the change, NS Power had closed recruitment for the Battery Storage Pilot and the selection process for potential candidate locations of home battery systems was underway. As the change to the Code specifically precluded anyone from installing a lithium-ion battery system within the 'dwelling unit,' this change was significant. NS Power had not asked applicants whether they had an otherwise suitable location (e.g. garage, outbuilding). To proceed, NS Power needed to contact each applicant to confirm the location for installation met the requirements of the Code, which led to considerable disappointment from customers who no longer qualified. NS Power did not consider installing batteries outdoors due to concerns about cold temperature performance and protection from weather events.

Changes to codes, regulations, and standards mid-project can have a detrimental effect on project schedule, budget, and customer experience. Future projects must be mindful to review any known work plans for codes and regularly monitor the regulatory environment for potential changes that could impact the project. In this case, NS Power reassessed applications and found customers with eligible homes with suitable locations for battery installation, compliant with the new Regulations.

[3] Electrical Code Regulations - Electrical Installation and Inspection Act (Nova Scotia) section 3(2)

14. Communication Cable Between Battery Energy Storage System Components

NS Power has experienced a recurring communication failure between the LG batteries and the LG inverter impacting some of the Sunverge/LG installations. This issue decreases battery reliability, causing the battery to go into a standby mode where it no longer accepts commands or performs as expected. Sunverge recommended replacing the communication cable between the inverter and the batteries with a 600V twisted pair. Two of the affected systems have been retrofitted so far, and NS Power is currently monitoring the status of these batteries to ensure the issue is resolved. Once verified, NS Power will proceed by replacing the communication cable across impacted batteries.

15. *ev.energy* – Platform Risk

Since *ev.energy* relies on third-party APIs, and their connections to EV systems are created by different vehicle manufacturers, it is reliant in part on the consent of the EV manufacturer to operate without explicit contracts in place. This creates a 'platform risk' that ev.energy may be prevented from connecting to certain manufacturers' EVs.

For example, in November 2022, some Chevrolet users on *ev.energy* began experiencing frequent token expiration, requiring users to continually reauthenticate their vehicle to their *ev.energy* account to continue participation. These users were then presented with warnings from the 'myChevrolet' app which suggested that connection to third-party apps is forbidden. This is a potential platform disruption that could remove a popular automaker from eligibility.

16. Cancelling EV Smart Charging before Weather Events

On the day of a recent storm in the July 2022 to December 2022 reporting period, a demand response (DR) event was scheduled on the *ev.energy* platform for the 17:00 to 19:00 period. Approximately 41 percent of customers that were plugged in, hit the boost button to immediately begin charging and opt-out of the event, likely in order to ensure their vehicle was charged prior to potential storm related outages. Even without the DR event, charging schedules could have been pushed into evening or overnight hours where a higher likelihood of power outage was forecasted, making it a possibility that the vehicle was not charged before the power went out for a prolonged time.

Canceling all DR events ahead of or during a forecasted weather event is now built into how NS Power operates its EV Smart Charging program. NS Power has also worked with *ev.energy* to develop a minimum viable product (MVP) test of a 'storm mode,' where customers that may be impacted by severe weather are encouraged to 'boost' to charge immediately via push notification and email. While in storm mode, any penalty for boosting during the impacted timeframe is waived. Results have been positive and may influence development of more automated functionality in the future.

17. Community Solar Garden site Retorque in Preparation for Severe Weather Event

During a severe weather event in the July 2022 to December 2022 reporting period, several panels at the Community Solar Garden were loosened and/or torn from the fasteners. The net impacts were relatively minor, and the site was recommissioned within a matter of days. Future preventative measures:

- Sample torque check is moved from Schedule B (in October) to Schedule A (in May) prior to the onset of the storm season. In addition, the operation and maintenance (O&M) contractor will document the sample chosen for the torque checks to avoid picking the same samples.
- NS Power will proactively consider retorque the whole site ahead of major wind and/or weather event.

18. Supporting New Assets through Severe Weather

Operationalization of a smart grid platform includes operating in normal conditions and use case testing, and also unique asset and customer support requirements during severe weather events. The project team continues to learn and evolve how it operates smart grid assets during weather events and communicates with participants ahead of, during, and following an event.

19. Prioritization of 'Ready by' Time in *ev.energy* Scheduling Algorithm

Through *ev.energy*, vehicles taking part in smart charging automatically have their charging schedule shifted close to the driver's selected 'ready by' time. This cannot be deselected if smart charging is 'on,' which is required if the driver would like to benefit from automated or time-varying tariff based schedules. When running use case testing via DR events or other grid signals on *ev.energy*, the prioritization of 'ready by' time cannot be removed from the experiment or the data. Correlating effects of use case testing may be difficult in this context. NS Power continues to explore this with *ev.energy*.

20. C&I Battery Energy Storage System + Solar PV Reactive Power Control

The current grid interconnection agreement, which applies to C&I battery energy storage system (BESS) + solar PV sites, does not allow for export to the grid. Zero export mode functionality was implemented at all three sites to meet the interconnection agreement requirement. When enabling zero export mode, all reactive power functionality that is supported by the inverter is lost – limiting some use case testing.

Following discussions with the interconnection team, it was decided to disable the export control for solar generation at two sites where building consumption significantly exceeds solar + battery production. NS Power is working to develop testing case deployment procedures for the third site, to reach an exception for temporarily disabling zero export functionality in order to proceed with testing case.

21. Solar Retrofit Customer Installation – New Rapid Shutdown Device

A rapid shutdown device, which was supplied for retrofitting DC-coupled solar PV to the LG inverters for Sunverge battery installations, short circuited and caught fire. It was determined that the seal at the PV input was damaged, allowing water to permeate the unit during a heavy rainstorm. Water and dust reduced the safety distance between high voltage parts and arc might have occurred and caused the incident.

The fire damaged the customer's solar array, but did not damage other property or persons, as it was discovered and mitigated soon after it started. The manufacturer took responsibility for repair and compensation to customer equipment and provided a new rapid shutdown device (RSD) with improved quality changes to eliminate similar incidents, which included an improved seal and anti-rotation protection on the input cabling. The entire NS Power stock has been replaced. NS Power will continue to monitor the new RSD and will inform the OEM to release a memorandum to ensure distributors are aware of the new device.

22. Fermata Current Transformer – Building Load Reading Issue

During the install and commissioning of the Fermata bi-directional charger, a current transformer (CT) metering system was also installed that reads the building load data back to the charger on one of the three feeders entering the building. Accurate and live building load information is required for the automated demand charge management (DCM) function to operate correctly. Once powered up, it was determined that the CT metering system approach was not successful. Currently, only partial load is being captured and alternate approaches are being examined to collect the building load data. An alternate approach is to connect the Fermata charger to the existing metering in the building through an open port in the appropriate network stack at Emera Place. NS Power IT architects are assisting in ensuring that this is done properly, and any potential risks are addressed.

Identifying and evaluating multiple solutions is important for pilot programs as the standard, or first approach, may not be the most effective one.

23. C&I Building Management System (Desigo) – ESP Signal to Desigo

For scheduled load reduction events, the ESP sends operating mode signals with an associated start time to the Commercial and Industrial (C&I) Building Management System (BMS), for the customer's site, as follows:

- 'mode 1' (off-peak) – start time scheduled 1-hour before DR event
- 'mode 2' (on-peak) – 1-to-4-hour duration
- 'mode 9' (standard) – start time scheduled at the end of the DR event

During an event on November 17, 2022, the host site did not receive the 'mode 9' signal as scheduled, at 19:00, leading the BMS to remain in mode 2 after the scheduled event period. ESP does not send the 'duration' to Desigo, only the start time signal. As of December 31, 2022, ESP is not sending the duration signal for events. The project team discussed the requirement of ESP to send signal duration to the BMS to avoid customer sites remaining in non-standard operating modes longer than intended. This change will require an ESP enhancement.

As a permanent workaround solution, Siemens implemented timers on the Desigo BMS server, as follows:

- After 1 hour and 5 minutes in 'mode 1' without ESP intervention, the BMS will automatically be switched to 'mode 2,' as if a signal had been received.
- After 4 hours and 5 minutes in 'mode 2' without ESP intervention, the BMS will automatically be switched automatically to 'mode 9,' as if a signal had been received.

This is an example of revising integration design and configuration in an agile manner, as learnings are extracted from testing and execution. Prompt identification of signal-related challenges, and the flexibility to pivot is an important component to pilot programs.

24. C&I BMS (Desigo) – Telemetry Outages Have been Observed

The telemetry at individual Desigo sites have experienced outages, which results in a loss of data in ESP and prevents ESP signals from reaching sites during that period. Siemens has implemented a process to identify and restore telemetry, as follows:

1. DesigoAdapter Health Monitor will email notification to Siemens first-line support, if not receiving telemetry data for more than 10 minutes.
2. The email notification will kick-off the 'outage triage process,' which includes the following steps:
    - First 10 to 15 minutes
      Step 1 – verify virtual private network (VPN) health
      Step 2 – verify ESP log files
      Step 3 – verify Desigo log files
    - Next 10 to 15 minutes, restart any service as required.
      Step 4 – if the 'outage' relates to the Site Local Network then the down time will depend on the availability of Site Local Network Administrator.

Implementation of a notification system and an accompanying process for restoring telemetry is another example of agile solutions and design adjustments for issues that arise within testing and execution. While restoration efforts continue to progress, identification and evaluation of various scenarios to adapt to challenges in the short run have been an important consideration for the Project.

25. Coritech Data Extract – Time Intervals Vary Based on Channel

In Nova Scotia Community College's (NSCC) Building Management System (BMS), which contains a dedicated page used to control the Coritech bidirectional charger, there is no option to select desired time interval for data extracts. The time intervals vary by channel (e.g. 15-minute intervals, intervals associated by data channel step change, etc.). This makes data comparison and analysis time consuming. In Q1 2023, the project team will work with NSCC and their BMS programmer, to discuss the potential of adding additional functionality for the system, including the ability to select a standardized interval (e.g. 15-minutes) for all channels.

26. Coritech Charger Commissioned with Coritech-owned Modem

A Coritech-owned modem was initially installed to allow Coritech to remotely access the bi-directional EV charger for commissioning. In December 2021, the modem was sent back to Coritech, at their request. Coritech is currently required to troubleshoot a reoccurring inverter fault at the charger; however, this has been delayed as NS Power arranged for a new modem to be configured and shipped to NSCC.

To prevent delays in troubleshooting in the future, NS Power has purchased a modem which will be configured by Coritech and reinstalled in the Coritech charger indefinitely.

27. Integration Monitoring and Error Notification

The team has encountered multiple occasions where EVSE events for ChargePoint devices have not been received by the devices after being scheduled through ESP. It was later discovered that the event signals were not making it to the chargers. With other assets, there are feedback loops for completed events, but for pre-scheduled events, better controls are required.

For example, the team receives event summaries from *ev.energy*, event recaps from Fermata, and real-time feedback with Coritech. This could be an internal (weekly event reviews setup based on Tableau reporting/dashboard) or external requirements to confirm events were scheduled, received and completed. The team will work with vendors and internally to enable regular monitoring and checks to ensure event scheduling and integrations are working. This learning would inform potential DERMS recommendation(s), as automated outage and error notifications are not always standard.

28. Availability of Certified Vehicle-to-Everything Capable Electric Vehicle Supply Equipment (Bi-Directional EV Chargers) for the Canadian Residential Market

Although the Project was able to secure prospective orders early from multiple manufacturers of bi-directional EV chargers (vehicle-to-everything [4] (V2X) capable EVSE) for the residential market, the chargers have experienced delays in certification and manufacturing in North American and, in particular, the Canadian market. V2X bi-directional EV chargers are experiencing trends not unlike those affecting other technologies and are prone to external market conditions that influence timing and availability. Some conditions that contribute to the lack of availability include the following:

- Emerging Standardization:
  - Internationally recognized standards that enable V2X bi-directional EV chargers communication signals between the vehicle and the EVSE, as well as the EVSE and the grid, are still emerging. This is a contributing factor in the adoption rate in the design and manufacturing of onboard charge controllers and V2X enabled vehicle software, as well as V2X capable EVSEs.

[4] Vehicle-to-everything technology communicates between a vehicle and any entity that may affect, or may be affected by, the vehicle – e.g. vehicle-to-home, vehicle-to-grid, etc.

- Jurisdictional safety authorities are catching up to ensure the safety of consumers, electricity providers, and infrastructure that are adopting V2X bi-directional EV chargers. In the US, UL9741 – Bidirectional Electric Vehicle Charging System Equipment was published in 2020. In Canada, the Canadian Standards Association (CSA) is currently drafting CSA C22.2 no. 348 for the safety certification of products that will facilitate bi-directional power transfer. It is expected to be released later this year.
- The affect of emerging standardization also includes the rise of CSS1/2 as the global charging standard (and subsequent fall of ChaDeMo), which too has changed the trajectory of global roadmaps of vehicles and manufacturers that support V2X bi-directional EV charging since the Project was originally contemplated. As more CCS equipped vehicles are announced for V2X roadmaps, EVSE manufacturers are focusing more on this standard, which in terms of V2X, is more nascent than ChaDeMo was when the Project was originally contemplated.

- Vehicle manufacturers like Ford, GM and Hyundai are readying their own product roadmaps to capture additional value from software and ancillary equipment enabled products and services in a transforming transportation sector. They are behind in development compared to some early announcements from EVSE manufacturers. However, as EVSE manufacturers control the software and physical components of the vehicles for sale in the market, they influence the speed at which the market emerges. Enabling activities are required to attract investment in and maturation of this emerging technology.
- The residential V2X bi-directional EV charger market is largely emerging first as vehicle to load (V2L) and vehicle to home (V2H) for energy resiliency in the face of supply interruption caused by severe weather events. Manufacturers are using this resiliency feature to market EVs to consumers and differentiate their offerings in a highly competitive marketplace that has been disrupted as of late by supply challenges and inflation. These resiliency features are still relatively expensive for the average homeowner. Energy market conditions that would allow a homeowner to make a case for a return on investment (i.e. transactional energy price arbitrage) are still emerging in select markets across North America, reducing the total addressable market for this type of product.
- Early technology developers may capitalize on hype to drive investment and momentum in their products and services, even if their roadmap is not clear. Challenging global market conditions in the electronics and physical goods supply chains have exacerbated development delays, creating knock on effects on schedules for product availability.

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PROTECTED when completed

RECIPIENT'S CLAIM SUMMARY and / or ADVANCE CLAIM

This is a ▶ ☑ **Claim** ☐ **Forecast**

- Submit Original to Industry Canada Project Officer
- Shaded Areas are for Departmental Use Only

Is this form for the Connecting Canadians program? ▶ ◯ Yes ◉ No

Program: Strategic Innovation Fund		
Project Start Date (YYYY-MM-DD): 2018-09-14	Project Completion Date (YYYY-MM-DD): 2023-03-31	Commercial Production Date (YYYY-MM-DD):
Name of Recipient(s) and Joint Payee (if applicable): Nova Scotia Power Inc.		
Address: Street, Unit Number, etc.: 1223 Lower Water St		
City: Halifax		
Province: Nova Scotia	Postal Code (X9X 9X9): B3J 3S8	
Contact: Chrissy Cruikshank	Telephone Number: 902 428-6421	

Final Claim ◯ Yes ◯ No	Claim Number	Endeavor	Project Number	Sub-Project
Application Received Date (YYYY-MM-DD)	Offer Accepted Date (YYYY-MM-DD)	Holdback Threshold Reached ◯ Yes ◯ No		

Control Points

FCF 20 /	$	Eligible Costs	$
Less: CY Payments to Date		Authorized Assistance	%
FCF Free Balance	$	Less: Cumulative Net Approved Assistance	
		Outstanding Advance	
		Available Balance	$

Other Control

CLAIM — ELIGIBLE COSTS CLAIMED

1. ELIGIBLE COSTS ◯ Incurred ◉ Paid	Current	Total to Date
Period Covered: From (YYYY-MM-DD)	2022-04-01	2018-09-14
To (YYYY-MM-DD)	2022-06-30	2022-03-31
Total Eligible Costs (as per "Detailed Claim" attached)	$ 806,422.00	$ 9,959,113.00
Industry Canada Share [redacted]	$ [redacted]	$ [redacted]

2. ADVANCES (only when provided for in the letter of offer - attach "Recipient's Cost Forecast")

Industry Canada Share - estimated cash requirements for period specified: $ ▶

CERTIFICATION (by recipient for each claim)

I certify that:

a) the costs described in this claim and considered eligible were or will be incurred under the agreement;
b) generally accepted and consistently followed accounting practices have been used;
c) Her Majesty's payment will be applied to the project in accordance with the agreement and costing memorandum;
d) if applicable, disclosure has been made of assets involved in or resulting from the project which ceased to be used or which were transferred to productive use, sold leased or otherwise disposed of;
e) if applicable, environmental protection measures have been implemented and are maintained; requirements of all regulatory bodies have been satisfied;
f) all representations, warranties and undertakings pursuant to the agreement remain applicable and in force;
g) there are no events of default under any of the provisions of the agreement and no state of facts exist which, with the giving of notice or the passing of time, or both, would constitute such an event of default;
h) no amounts payable are outstanding in connection with the agreement or otherwise or in connection with the alleged compliance or non compliance by the Minister of his/her obligations under the agreement.

Shawn Connell — Digitally signed by Shawn Connell Date: 2022.08.23 11:34:14 -03'00'

Signature of Authorized Official

Title	Date (YYYY-MM-DD)
Director, Cust Solutions	8/23/22

PAYMENT CALCULATION

	Current	Cumulative
Approved Eligible Costs	$	$
Gross Approved Assistance %		
Holdback		
NET APPROVED ASSISTANCE	0.00	
Outstanding Advance		
Amount Owing (receivable)		
ADVANCE		
Adjustments or Recoveries (explain below)		
REQUESTED PAYMENT ▶	$ [redacted]	

APPROVED AND CERTIFIED pursuant to Departmental Signing Authorities.
The amount payable relates to costs that:

☐ are eligible and reasonable; ☐ will be incurred within the advance period;
☐ are reasonably in step with work performed in a satisfactory manner;
☐ all required terms and conditions of the agreement have been met.

Recommended by

Title	Officer Code
Signature	Date (YYYY-MM-DD)

Approved and Certified pursuant to Section 34 1(b) of the FAA

Title	
Signature	Date (YYYY-MM-DD)

REMARKS

Charge to:

DEPARTMENT CASH FORECAST - BALANCE OF PROJECT INCLUDING CY PAYMENTS, CLAIMS IN PROGRESS AND AMOUNT OF HOLDBACK

FCF 20 20	FCF+1 20 20	FCF+2 20 20	FCF+3 20 20	FCF+4 20 20	Future Years
$	$	$	$	$	$

Canada

Innovation, Science and Economic Development Canada

Innovation, Sciences et Développement économique Canada

APPENDIX B
ELIGIBLE PROJECT COSTS BY CATEGORY

ANNEXE B
COÛTS DE PROJET ÉLIGIBLES PAR CATEGORIE

PROTECTED-PROTÉGÉ

Instructions:
Please use the **Appendix C** to complete the table below. Only the total amounts of each cost category should be entered on this form.
Veuillez SVP utiliser l'**Annexe C** pour compléter le tableau ci-dessous. Seuls les montants totaux de chaque catégorie de coûts doivent être entrés sur cette annexe.

Name of Recipient - Nom du bénéficiaire	**Project No. - Nº du projet**	**Claim No. - Nº de réclamation**
Nova Scotia Power	811-812712	15

Cost Category / Catégorie de Coût	**Eligible Costs Incurred to the Nearest Dollar Coûts éligibles encourus arrondis au dollar près**		
	Current Claim Réclamation Actuelle	Prior Claims Réclamations Précédentes	Total to Date Total à ce Jour
Direct Labour / Main-d'oeuvre directe	58,711	824,154	882,865
Direct Materials / Matériaux directs	0	0	0
Subcontracts and Consultants / Sous-traitants et Consultants	713,562	5,949,460	6,663,022
Overhead / Charges Indirectes	32,291	453,285	485,576
Equipments / Équipements	0	1,892,878	1,892,878
Special Purpose Equipments / Équipements Spécialisés	0	0	0
Other Direct Costs & Travel / Autres Coûts Directs & Frais de Voyage	1,858	32,914	34,772
Land and Building - Terrain et Immeuble	0	0	0
			0
TOTAL COSTS - COÛTS TOTAUX*	[1] 806,422	9,152,691	[2] 9,959,113

* Please use the *Current Claim* total (1) and the *Total to Date* (2) to complete the **Appendix A - *Recipient's Claim Summary*** .
* Veuillez SVP utiliser le total de la *Réclamation Actuelle* (1) ainsi que le *Total à ce Jour* (2) pour compléter l'**Annexe A - *Sommaire de la réclamation du bénéficiaire*** .

Remarks - Remarques

Signature of Authorized Official
Signature d'un Officier Autorisé

Shawn Connell

Digitally signed by Shawn Connell
Date: 2022.08.23 11:34:47 -03'00'

Date

CI C0010788 – Smart Grid Semi-Annual Report Attachment 6c has been removed due to confidentiality.

PROGRESS REPORT

Siemens Canada Limited, New Brunswick Power Corporation, Nova Scotia Power Incorporated

STRATEGIC INNOVATION FUND

SMART GRID ATLANTIC

811-812712

CLAIM NUMBER

15

REPORTING PERIOD: 2022-04-01 - 2022-06-30

Report Date: 2022-08-10

Activity Report

1. Project Summary

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

2. Activities and Work

Activity # 1: Energy Services Platform (ESP) / Microgrid Control Platform (MCP) Software Development

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

[redacted]

- [redacted]
- [redacted]

[redacted]

- [redacted]
- [redacted]

[redacted]

- [redacted]

Activity #2: Shediac Smart Energy Community Demonstration

% Completion	Status	Comments
[redacted]	[redacted]	• [redacted] • [redacted]

Details of Activity Performed

[redacted]

Activity #3: Smart Grid Nova Scotia Demonstration

% Completion	Status	Comments
93%	On Schedule	Asset installations partially complete.

Details of Activity Performed

Community Solar:

- The solar garden began generating energy for subscribers on February 1, 2022.
- Community solar program launched; program is ~75% subscribed. Customers now receiving monthly subscription updates.
- Launched solar garden performance page on the nspower.ca website.

Commercial and Industrial:

- Solar Array and Battery Energy Storage System (BESS) installation completed at the three customer sites.
- BESS commissioning and capacity test completed at the three customers sites.
- BESS UL9540 (Energy Storage System Requirements) field certification has been completed and passed at the three customer sites.
- PV array (ground mounts) commissioning completed at two customer sites. Commissioning for the solar PV roof top project is in progress.
- Electrical inspections have been passed at two customer sites (ground mounts), the third site final inspection is booked electrical as built drawings have been issued for all 3 sites (revision by NS Power is currently in progress)

Battery Storage

- Battery installations were completed with the exception of 1 battery at complex sites; preparation work complete for the site. The remaining installation does not affect testing plan and will be completed by the end of Q4 2022.
- Battery systems operating as expected including providing resiliency during major weather events throughout Jan/Feb/.

Project Management

- Energy System Platform (ESP) Integration of the ChargePoint EV smart chargers is now generally complete; deficiencies regarding ESP functionality are currently being remedied. While the initial integration for the first use cases was complete in early 2021, refinements to the integration continued after that date. Integration to the NS Power Pi system was completed during the report period to make additional operational data available. The successful integration to achieve the first use case test is marked on the Project timeline.
- Sunverge battery storage system testing continues.
- The conformance testing for Tesla residential batteries is ongoing between Siemens and Tesla as a joint effort between Siemens, NS Power and NB Power.
- Design efforts for the remaining devices including C&I solar and battery and solar garden integrations are still ongoing.

Activity #4: Tobique Microgrid Demonstration

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

- [redacted]

[redacted]

Activity #5: North Branch (previously Halls Creek) Smart Energy Development

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

[redacted]

Activity #6: Program Governance and Management

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

[redacted]

3. Collaborative Activities

Activity #1: Energy Services Platform (ESP) / Microgrid Control Platform (MCP) Software Development

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

[redacted]

Activity #2 Shediac Smart Energy Community Demonstration

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

- [redacted]
- [redacted]

Activity # 3 Smart Grid Nova Scotia Demonstration

% Completion	Status	Comments
NA	NA	Not a formal work package under this program, however, collaborations noted below:

Details of Activity Performed

- Dalhousie University is engaged on DER monitoring and management.
- A University of New Brunswick master's student is involved in the project for modeling of DER program potential.
- Efficiency One continues to support the project in an advisory role.
  Development of the solar garden site includes ongoing engagement with the Town of Amherst on participant recruitment efforts, signage, other communications, and benefits to the community.

Activity #4: Tobique Microgrid Demonstration

% Completion	Status	Comments
	[redacted]	

Details of Activity Performed

-

Activity #5: North Branch (previously Halls Creek) Smart Energy Development

% Completion	Status	Comments
	[redacted]	

Details of Activity Performed

- [redacted]

Activity # 6: Program Governance and Management

% Completion	Status	Comments
	[redacted]	

Details of Activity Performed

-

Cost Report

Siemens:

1. Foreign Costs – Describe any foreign costs incurred, if allowed in the Contribution Agreement.

[redacted]

2. Cost Deviations – Report on any significant deviations in actual costs compared to the Contribution Agreement.

[redacted]

3. Cash Flow Deviations – Report on any significant deviations in the cash flow forecast compared to the forecast in previous claim.

[redacted]

NB Power

1. Foreign Costs – Describe any foreign costs incurred, if allowed in the Contribution Agreement.

[redacted]

2. Cost Deviations – Report on any significant deviations in actual costs compared to the Contribution Agreement.

[redacted]

3. Cash Flow Deviations – Report on any significant deviations in the cash flow forecast compared to the forecast in previous claim.

a) [redacted]

b) [redacted]

c) [redacted]

d) [redacted]

NS Power:

1. Foreign Costs – Describe any foreign costs incurred, if allowed in the Contribution Agreement.

None allowed in the Agreement.

2. Cost Deviations – Report on any significant deviations in actual costs compared to the Contribution Agreement.

There are no new deviations to report. As previously reported, an amendment to the annual spend as reflected in the contribution agreement has been requested to shift more spend into the later years of the project.

3. Cash Flow Deviations – Report on any significant deviations in the cash flow forecast compared to the forecast in previous claim.

None.

Risk and Issues Report

Siemens:

1. [redacted]

2. [redacted]

3. [redacted]

   a) [redacted]

NB Power:

1. [redacted]

2. [redacted]

3. [redacted]

NS Power:

1. NS Power continues to monitor COVID-19 activity and restrictions in Nova Scotia as the project continues. The delay caused by restrictions in the last claim resulted in a delay to distributed battery installations by a month, but no other project impacts.

   Mitigation: Work continues that can be done safely for all employees, contractors and customers and in accordance with Provincial and Company guidelines.

Corporate Update

[redacted]

Certification

Siemens:

I, Terrance Cormier, certify that to the best of my knowledge and understanding all information contained in this Report is accurate.

Terrance Cormier

Aug 10, 2022

Siemens Canada Limited:
Terrance Cormier
Siemens SGA PMO Lead

Date

NB Power:

I Brent Staeben, certify that to the best of my knowledge and understanding all information contained in this Report is accurate.

New Brunswick Power Corporation:
Brent Staeben
Sr VP - Operations

Date

NS Power:

I, Sanjeev Pushkarna, certify that to the best of my knowledge and understanding all information contained in this Report is accurate.



August 17, 2022

Nova Scotia Power Incorporation:
Sanjeev Pushkarna, Senior Program Manager, Smart Grid
Nova Scotia

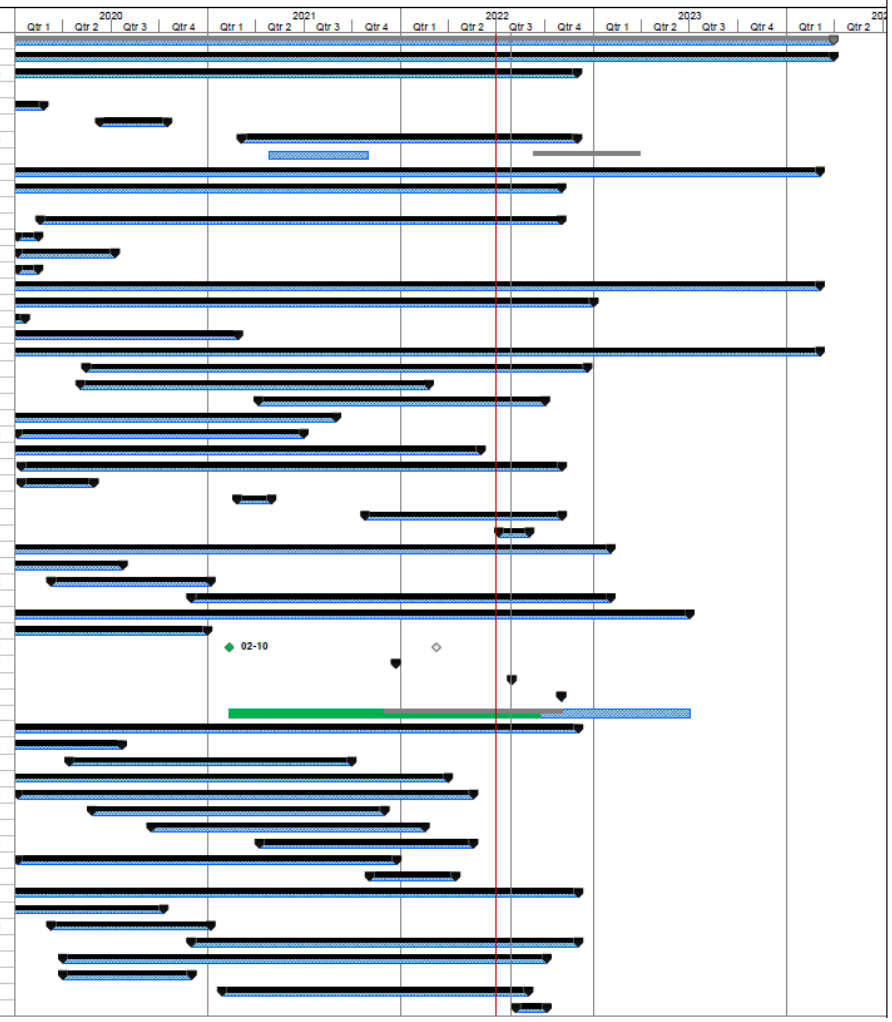
Date

Appendix

1. Gantt chart- updated

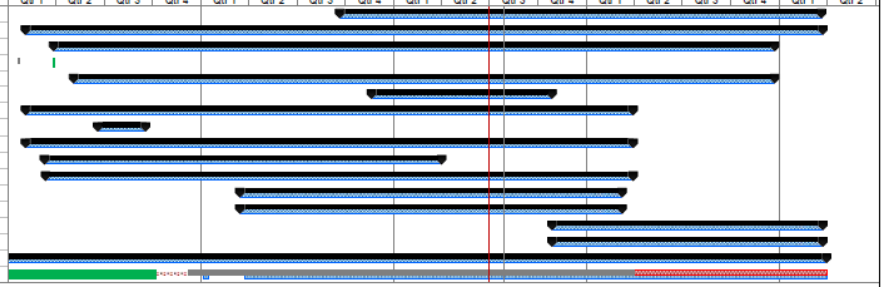
SGA - Integrated Master Schedule - Calendar Years - 30 June 2022

ID	% Complete	Task Name	Start	Finish
0	70%	Smart Grid Atlantic Master Schedule	Mon 18-02-12	Fri 24-03-29
1	70%	Smart Grid Atlantic Program - Integrated Master Schedule	Mon 18-02-12	Fri 24-03-29
2	53%	ESP/MCP Development	Wed 19-01-23	Wed 22-11-30
3	100%	Inception Workshops	Wed 19-01-23	Thu 19-06-27
28	100%	ESP Release 1	Mon 19-04-08	Tue 20-02-25
36	100%	ESP Release 2	Wed 20-06-10	Thu 20-10-15
45	39%	ESP & MCP Release 3	Fri 21-03-05	Wed 22-11-30
58	0%	ESP/MCP Final Product Wrapup	Tue 21-04-27	Fri 21-10-29
59	81%	Shediac Smart Energy Community Demonstration	Mon 18-02-12	Mon 24-03-04
60	96%	Shediac Engineering Procurement and Program Design/Development	Mon 18-02-12	Mon 22-10-31
61	100%	Engineering Procurement	Mon 18-02-12	Fri 19-11-22
62	94%	S10 DER Program Design/Development (Customer and Utility Programs ar	Tue 20-02-18	Mon 22-10-31
83	100%	SWH Equipment (LC)	Mon 20-01-06	Sat 20-02-15
86	100%	Community PV & Battery Equipment (LG/TES)	Mon 20-01-06	Wed 20-07-08
89	100%	Thermal Storage Equipment (SHP)	Mon 20-01-06	Sat 20-02-15
92	77%	Shediac Infrastructure	Tue 18-10-09	Mon 24-03-04
93	95%	S02 Shediac Community Solar Farm/BESS	Tue 18-10-09	Sat 22-12-31
106	100%	S03 Metering Phase 1 (Meters, Line Sensors, Inverters)	Tue 19-10-15	Mon 20-01-20
110	100%	S04 Metering Phase 2	Mon 18-10-29	Fri 21-02-26
116	63%	S00 (previously S05) Residential Smart Energy Research	Wed 19-08-14	Mon 24-03-04
137	96%	S06 Shediac Multipurpose Centre (MPC)	Fri 20-05-15	Mon 22-12-19
145	100%	S06 Shediac Pension Centre (SPC)	Mon 20-05-04	Tue 22-02-22
152	83%	S07 Data Integration	Tue 21-04-06	Fri 22-09-30
155	100%	S08 Shediac Residential Installations (500 homes) Device selection / procu	Mon 19-11-25	Tue 21-08-31
159	100%	S11 NBP Cyber Security (appliance) ~ project closed	Mon 20-01-06	Wed 21-06-30
162	70%	S12 Customer Facing Systems (Presentment/MDM)	Fri 19-10-25	Tue 22-05-31
166	73%	S09 ESP Integration - NB Internal System Design/Development	Mon 20-01-13	Tue 22-11-01
167	100%	Enterprise Service Bus Initial Integrations	Mon 20-01-13	Fri 20-05-29
170	100%	R3a - NBP Systems	Thu 21-02-25	Fri 21-04-30
180	70%	R3b - NBP Systems	Mon 21-10-25	Tue 22-11-01
191	0%	R3c - NBP Systems	Tue 22-07-05	Wed 22-08-31
197	87%	ESP/MCP Deployment	Fri 19-08-09	Wed 23-02-01
198	100%	ESP SW R1 Deployment	Fri 19-08-09	Thu 20-07-23
214	100%	ESP SW R2 Deployment and System Integration	Tue 20-03-10	Wed 21-01-06
233	74%	ESP/MCP SW R3 Deployment and System Integration	Mon 20-11-30	Wed 23-02-01
261	78%	S10 Program Implementation Post-Build Engineering and Business Model St	Fri 19-11-22	Fri 23-06-30
262	100%	Shediac Baseline Data Collection	Fri 19-11-22	Wed 20-12-30
264	100%	Shediac Pilot Period 1a (ties to r2b)	Wed 21-02-10	Wed 21-02-10
266	100%	Shediac Pilot Period 1b (ties to 3a)	Wed 21-12-22	Wed 21-12-22
268	0%	Shediac Pilot Period 2 (ties to 3b)	Fri 22-07-29	Fri 22-07-29
270	0%	Shediac Pilot Period 3 (ties to 3c)	Mon 22-10-31	Mon 22-10-31
272	68%	Run SGA DER Programs	Wed 21-02-10	Fri 23-06-30
273	86%	Smart Grid Nova Scotia Demonstration	Fri 19-06-28	Fri 22-12-02
274	100%	UARB Filing and Approvals	Fri 19-12-06	Wed 20-07-22
278	100%	Smart Grid NS Customer Recruitment, Program Design	Mon 20-04-13	Thu 21-09-30
289	93%	Smart Grid NS Prim Engineering/Procurement	Fri 19-06-28	Thu 22-03-31
337	90%	Smart Grid NS Infrastructure/Implementation	Tue 20-01-07	Wed 22-05-18
338	100%	Electric Vehicle Chargers (EVSE-CP)	Tue 20-05-26	Wed 21-12-01
344	88%	Distributed Battery (SV)	Tue 20-09-15	Tue 22-02-15
351	89%	Distributed Battery (T)	Thu 21-04-08	Wed 22-05-18
355	100%	Community Solar Garden	Tue 20-01-07	Thu 21-12-23
382	10%	C&I Solar+Battery	Tue 21-11-02	Thu 22-04-14
400	83%	ESP Deployment	Fri 19-08-09	Fri 22-12-02
401	100%	ESP SW R1 Deployment	Fri 19-08-09	Thu 20-10-08
417	100%	ESP SW R2 Deployment and System Integration	Tue 20-03-10	Wed 21-01-06
436	65%	ESP/MCP SW R3 Deployment and System Integration	Mon 20-11-30	Fri 22-12-02
464	55%	Smart Grid NS Post-Build Engineering and Business Model Studies	Wed 20-04-01	Mon 22-10-03
465	100%	Baseline Data Collection (only C&I from within utility)	Wed 20-04-01	Mon 20-11-30
467	48%	NS Power Pilot Period 1	Wed 21-01-27	Tue 22-08-30
471	0%	NS Power Pilot Period 2	Fri 22-08-05	Mon 22-10-03



SGA - Integrated Master Schedule - Calendar Years - 30 June 2022

ID	% Complete	Task Name	Start	Finish
475	1%	~~First Nations Microgrid Demonstration (UNDER REVIEW)~~	Mon 21-09-20	Tue 24-03-19
526	42%	North Branch Demonstration	Mon 20-02-03	Fri 24-03-22
527	26%	North Branch Program Agreements/Stakeholder/Customer Engagement Rea	Fri 20-03-27	Fri 23-12-22
528	100%	Home Builder's agreement	Fri 20-03-27	Fri 20-03-27
529	29%	Customer / Stakeholder Engagement	Mon 20-05-04	Fri 23-12-22
532	9%	Customer Neighbourhood Program	Fri 21-11-19	Wed 22-10-26
537	63%	North Branch Design/Infrastructure	Mon 20-02-03	Wed 23-03-29
538	100%	DER Selection	Fri 20-06-19	Wed 20-09-16
544	39%	North Branch Develop / Customer Equipment Installation	Mon 20-02-03	Wed 23-03-29
553	93%	North Branch Microgrid Installation	Mon 20-03-09	Thu 22-03-31
559	62%	North Branch Nanogrid Installation	Wed 20-03-11	Wed 23-03-29
567	42%	ESP/MCP Deployment	Mon 21-03-15	Wed 23-03-08
568	42%	ESP/MCP SW R3 Deployment and System Integration	Mon 21-03-15	Wed 23-03-08
597	0%	~~North Branch Customer Business Model Studies (e.g. Neighbourhood Energ~~	Wed 22-10-26	Fri 24-03-22
598	0%	~~North Branch Pilot Period~~	Wed 22-10-26	Fri 24-03-22
602	36%	Program Governance and Management	Fri 19-01-25	Fri 24-03-29
603	36%	PMO Governance and Project Management	Fri 19-01-25	Fri 24-03-29



Innovation, Science and Economic Development Canada | Innovation, Sciences et Développement économique Canada

PROTECTED when completed

RECIPIENT'S CLAIM SUMMARY and / or ADVANCE CLAIM

This is a ▶ ☑ Claim ☐ Forecast

- Submit Original to Industry Canada Project Officer
- Shaded Areas are for Departmental Use Only

Is this form for the Connecting Canadians program? ▶ ○ Yes ◉ No

Program: Strategic Innovation Fund			Final Claim: ○ Yes ◉ No	Claim Number	Endeavor / Project Number / Sub-Project
Project Start Date (YYYY-MM-DD): 2018-09-14	Project Completion Date (YYYY-MM-DD): 2023-03-31	Commercial Production Date (YYYY-MM-DD)	Application Received Date (YYYY-MM-DD)	Offer Accepted Date (YYYY-MM-DD)	Holdback Threshold Reached ○ Yes ○ No
Name of Recipient(s) and Joint Payee (if applicable): Nova Scotia Power Inc.			Control Points		
Address: Street, Unit Number, etc.: 1223 Lower Water St.			FCF 20 / $		Eligible Costs $
City: Halifax			Less: CY Payments to Date		Authorized Assistance % 0
Province: Nova Scotia	Postal Code (X9X 9X9): B3J 3S8		FCF Free Balance $		Less: Cumulative Net Approved Assistance
Contact: Karynne Munroe	Telephone Number: (902) 456-1181				Outstanding Advance
					Available Balance $
			Other Control		

CLAIM — **ELIGIBLE COSTS CLAIMED**

1. ELIGIBLE COSTS ○ Incurred ◉ Paid	Current	Total to Date
Period Covered	From (YYYY-MM-DD): 2022-07-01	From (YYYY-MM-DD): 2018-09-14
	To (YYYY-MM-DD): 2022-09-30	To (YYYY-MM-DD): 2022-09-30
Total Eligible Costs (as per "Detailed Claim" attached)	$ 447,260.15	$ 10,406,373.15
Industry Canada Share [redacted]	$ [redacted]	$ [redacted]

2. ADVANCES (only when provided for in the letter of offer - attach "Recipient's Cost Forecast")

Industry Canada Share - estimated cash requirements for period specified: $ ▶

PAYMENT CALCULATION	Current	Cumulative
Approved Eligible Costs	$	$
Gross Approved Assistance %		
Holdback		
NET APPROVED ASSISTANCE		
Outstanding Advance		
Amount Owing (receivable)		
ADVANCE		
Adjustments or Recoveries (explain below)		
REQUESTED PAYMENT ▶	$	

CERTIFICATION (by recipient for each claim)

I certify that:

a) the costs described in this claim and considered eligible were or will be incurred under the agreement;
b) generally accepted and consistently followed accounting practices have been used;
c) Her Majesty's payment will be applied to the project in accordance with the agreement and costing memorandum;
d) if applicable, disclosure has been made of assets involved in or resulting from the project which ceased to be used or which were transferred to productive use, sold leased or otherwise disposed of;
e) if applicable, environmental protection measures have been implemented and are maintained; requirements of all regulatory bodies have been satisfied;
f) all representations, warranties and undertakings pursuant to the agreement remain applicable and in force;
g) there are no events of default under any of the provisions of the agreement and no state of facts exist which, with the giving of notice or the passing of time, or both, would constitute such an event of default;
h) no amounts payable are outstanding in connection with the agreement or otherwise or in connection with the alleged compliance or non compliance by the Minister of his/her obligations under the agreement.

Shawn Connell — Digitally signed by Shawn Connell Date: 2022.11.15 17:44:46 -04'00'

Signature of Authorized Official

Title: Senior Director, Key Accounts & Customer Solutions | Date (YYYY-MM-DD): 2022-11-15

APPROVED AND CERTIFIED pursuant to Departmental Signing Authorities. The amount payable relates to costs that:

☐ are eligible and reasonable; ☐ will be incurred within the advance period;
☐ are reasonably in step with work performed in a satisfactory manner;
☐ all required terms and conditions of the agreement have been met.

Recommended by

Title	Officer Code
Signature	Date (YYYY-MM-DD)

Approved and Certified pursuant to Section 34 1(b) of the FAA

Title	
Signature	Date (YYYY-MM-DD)

REMARKS — Charge to:

DEPARTMENT CASH FORECAST - BALANCE OF PROJECT INCLUDING CY PAYMENTS, CLAIMS IN PROGRESS AND AMOUNT OF HOLDBACK

FCF 20 20	FCF+1 20 20	FCF+2 20 20	FCF+3 20 20	FCF+4 20 20	Future Years
$	$	$	$	$	$

Canada

Innovation, Science and Economic Development Canada

Innovation, Sciences et Développement économique Canada

APPENDIX B
ELIGIBLE PROJECT COSTS BY CATEGORY

ANNEXE B
COÛTS DE PROJET ÉLIGIBLES PAR CATEGORIE

PROTECTED-PROTÉGÉ

Instructions:
Please use the **Appendix C** to complete the table below. Only the total amounts of each cost category should be entered on this form.
Veuillez SVP utiliser l'**Annexe C** pour compléter le tableau ci-dessous. Seuls les montants totaux de chaque catégorie de coûts doivent être entrés sur cette annexe.

Name of Recipient - Nom du bénéficiaire	**Project No. - Nº du projet**	**Claim No. - Nº de réclamation**
Nova Scotia Power Inc.	811-812712	16

Cost Category / Catégorie de Coût	**Eligible Costs Incurred to the Nearest Dollar Coûts éligibles encourus arrondis au dollar près**		
	Current Claim Réclamation Actuelle	Prior Claims Réclamations Précédentes	Total to Date Total à ce Jour
Direct Labour / Main-d'oeuvre directe	55,531	882,865	938,396
Direct Materials / Matériaux directs	0	0	0
Subcontracts and Consultants / Sous-traitants et Consultants	303,903	6,663,022	6,966,925
Overhead / Charges Indirectes	30,542	485,576	516,118
Equipments / Équipements	56,480	1,892,878	1,949,358
Special Purpose Equipments / Équipements Spécialisés	0	0	0
Other Direct Costs & Travel / Autres Coûts Directs & Frais de Voyage	804	34,772	35,576
Land and Building - Terrain et Immeuble	0	0	0
			0
TOTAL COSTS - COÛTS TOTAUX*	[1] 447,260	9,959,113	[2] 10,406,373

* Please use the *Current Claim* total (1) and the *Total to Date* (2) to complete the **Appendix A - *Recipient's Claim Summary*** .
* Veuillez SVP utiliser le total de la *Réclamation Actuelle* (1) ainsi que le *Total à ce Jour* (2) pour compléter l'**Annexe A - *Sommaire de la réclamation du bénéficiaire*** .

Remarks - Remarques

Signature of Authorized Official
Signature d'un Officier Autorisé

Shawn Connell

Digitally signed by Shawn Connell
Date: 2022.11.15 17:46:06 -04'00'

Date

CI C0010788 – Smart Grid Semi-Annual Report Attachment 7c has been removed due to confidentiality.

PROGRESS REPORT

Siemens Canada Limited, New Brunswick Power Corporation, Nova Scotia Power Incorporated

STRATEGIC INNOVATION FUND

SMART GRID ATLANTIC

811-812712

CLAIM NUMBER

16

REPORTING PERIOD: 2022-07-01 - 2022-09-30

Report Date: 2022-11-07

Activity Report

1. Project Summary

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

2. Activities and Work

Activity # 1: Energy Services Platform (ESP) / Microgrid Control Platform (MCP) Software Development

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

[redacted]

Activity #2: Shediac Smart Energy Community Demonstration

% Completion	Status	Comments
[redacted]	[redacted]	• [redacted] • [redacted]

Details of Activity Performed

[redacted]

Activity #3: Smart Grid Nova Scotia Demonstration

% Completion	Status	Comments
95%	On Schedule	Asset installations partially complete.

Details of Activity Performed

Community Solar:

- The solar garden began generating energy for subscribers on February 1, 2022.

- Community solar program launched; program is ~75% subscribed. Customers now receiving monthly subscription updates.
- Launched solar garden performance page on the nspower.ca website.

Commercial and Industrial:

- Solar Array and Battery Energy Storage System (BESS) installation completed at the three customer sites.
- BESS commissioning and capacity test completed at the three customers sites.
- BESS UL9540 (Energy Storage System Requirements) field certification has been completed and passed at the three customer sites.
- PV array (ground mounts) commissioning completed at two customer sites. Commissioning for the solar PV roof top project also complete.
- Electrical inspections have been passed at all customer sites.

Battery Storage

- Battery installations were completed with the exception of 1 battery at complex sites; preparation work complete for the site. The remaining installation does not affect testing plan and will be completed by the end of Q4 2022.
- Battery systems operating as expected including providing resiliency during major weather events throughout Q1 and recent hurricane.

Project Management

- Energy System Platform (ESP) Integration of the ChargePoint EV smart chargers is now complete. While the initial integration for the first use cases was complete in early 2021, refinements to the integration continued after that date. Integration to the NS Power Pi system was completed during the report period to make additional operational data available. The successful integration to achieve the first use case test is marked on the Project timeline.
- Sunverge battery storage system testing continues.
- Desigo (building management systems) now connected to 3 commercial sites: Halifax Airport, Halifax Central Library and Queen Place Emera Centre (Liverpool). Use-case testing underway.
- The conformance testing for Tesla residential batteries is ongoing between Siemens and Tesla as a joint effort between Siemens, NS Power and NB Power.
- Design efforts for the remaining devices including C&I solar and battery integrations are still ongoing.

Activity #4: Tobique Microgrid Demonstration

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

Activity #5: North Branch (previously Halls Creek) Smart Energy Development

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

- [redacted]
- [redacted]

Activity #6: Program Governance and Management

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

- [redacted]
- [redacted]
- [redacted]

3. Collaborative Activities

Activity #1: Energy Services Platform (ESP) / Microgrid Control Platform (MCP) Software Development

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

- [redacted]

Activity #2 Shediac Smart Energy Community Demonstration

% Completion	Status	Comments
[redacted]	[redacted]	[redacted]

Details of Activity Performed

- [redacted]
- [redacted]

Activity # 3 Smart Grid Nova Scotia Demonstration

% Completion	Status	Comments
NA	NA	Not a formal work package under this program, however, collaborations noted below:

Details of Activity Performed

- Dalhousie University is engaged on DER monitoring and management.
- A University of New Brunswick master's student is involved in the project for modeling of DER program potential.
- Efficiency One continues to support the project in an advisory role.
  Development of the solar garden site includes ongoing engagement with the Town of Amherst on participant recruitment efforts, signage, other communications, and benefits to the community.

Activity #4: Tobique Microgrid Demonstration

% Completion	Status	Comments
	[redacted]	

Details of Activity Performed

- [redacted]

Activity #5: North Branch (previously Halls Creek) Smart Energy Development

% Completion	Status	Comments
	[redacted]	

Details of Activity Performed

- [redacted]

Activity # 6: Program Governance and Management

% Completion	Status	Comments
	[redacted]	

Details of Activity Performed

-

Cost Report

Siemens:

1. Foreign Costs – Describe any foreign costs incurred, if allowed in the Contribution Agreement.

[redacted]

2. Cost Deviations – Report on any significant deviations in actual costs compared to the Contribution Agreement.

[redacted]

3. Cash Flow Deviations – Report on any significant deviations in the cash flow forecast compared to the forecast in previous claim.

[redacted]

NB Power:

1. Foreign Costs – Describe any foreign costs incurred, if allowed in the Contribution Agreement.

[redacted]

2. Cost Deviations – Report on any significant deviations in actual costs compared to the Contribution Agreement.

[redacted]

3. Cash Flow Deviations – Report on any significant deviations in the cash flow forecast compared to the forecast in previous claim.

a) [redacted]

b) [redacted]

c) [redacted]

d) [redacted]

e) [redacted]

NS Power:

1. Foreign Costs – Describe any foreign costs incurred, if allowed in the Contribution Agreement.

None allowed in the Agreement.

2. Cost Deviations – Report on any significant deviations in actual costs compared to the Contribution Agreement.

There are no new deviations to report. As previously reported, an amendment to the annual spend as reflected in the contribution agreement has been requested to shift more spend into the later years of the project.

3. Cash Flow Deviations – Report on any significant deviations in the cash flow forecast compared to the forecast in previous claim.

None.

Risk and Issues Report

Siemens:

1. [redacted]

2. [redacted]

3. [redacted]

   a) [redacted]

NB Power:

1. [redacted]

2. [redacted]

3. [redacted]

[redacted]

NS Power:

1. NS Power continues to monitor COVID-19 activity and restrictions in Nova Scotia as the project continues. The delay caused by restrictions in the last claim resulted in a delay to distributed battery installations by a month, but no other project impacts.

   Mitigation: Work continues that can be done safely for all employees, contractors and customers and in accordance with Provincial and Company guidelines.

2. Efficient access to data to complete analysis and demonstrate value of utility managed DERs.

   Mitigation: continue to focus on access to data from various sources, including ESP, faster to ensure adequate time for analysis.

Corporate Update

[redacted]

Certification

Siemens:

I, Terrance Cormier, certify that to the best of my knowledge and understanding all information contained in this Report is accurate.

Terrance Cormier

Nov 10, 2022

Siemens Canada Limited:
Terrance Cormier
Siemens SGA PMO Lead

Date

NB Power:

I Brent Staeben, certify that to the best of my knowledge and understanding all information contained in this Report is accurate.



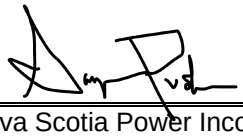
New Brunswick Power Corporation:
Brent Staeben
Sr VP - Operations

Nov 15/22

Date

NS Power:

I, Sanjeev Pushkarna, certify that to the best of my knowledge and understanding all information contained in this Report is accurate.



Nov 10, 2022

Nova Scotia Power Incorporation:
Sanjeev Pushkarna, Senior Program Manager, Smart Grid
Nova Scotia

Date

Appendix

1. Gantt chart- updated

SGA - Integrated Master Schedule - Calendar Years - 30 Sept 2022

ID	% Complete	Task Name	Start	Finish
0	79%	Smart Grid Atlantic Master Schedule	Mon 18-02-12	Mon 24-03-04
1	79%	Smart Grid Atlantic Program - Integrated Master Schedule	Mon 18-02-12	Mon 24-03-04
2	82%	ESP/MCP Development	Wed 19-01-23	Thu 22-12-15
3	100%	Inception Workshops	Wed 19-01-23	Thu 19-06-27
28	100%	ESP Release 1	Mon 19-04-08	Tue 20-02-25
36	100%	ESP Release 2	Wed 20-06-10	Thu 20-10-15
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58	100%	ESP/MCP Final Product Wrapup	Tue 21-04-27	Fri 21-10-29
59	81%	Shediac Smart Energy Community Demonstration	Mon 18-02-12	Mon 24-03-04
60	100%	Shediac Engineering Procurement and Program Design/Development	Mon 18-02-12	Mon 22-10-31
92	77%	Shediac Infrastructure	Tue 18-10-09	Mon 24-03-04
93	95%	S02 Shediac Community Solar Farm/BESS	Tue 18-10-09	Sat 22-12-31
106	100%	S03 Metering Phase 1 (Meters, Line Sensors, Inverters)	Tue 19-10-15	Mon 20-01-20
110	100%	S04 Metering Phase 2	Mon 18-10-29	Fri 21-02-26
116	63%	S00 (previously S05) Residential Smart Energy Research	Wed 19-08-14	Mon 24-03-04
137	96%	S06 Shediac Multipurpose Centre (MPC)	Fri 20-05-15	Mon 22-12-19
145	100%	S06 Shediac Pension Centre (SPC)	Mon 20-05-04	Tue 22-02-22
152	83%	S07 Data Integration	Tue 21-04-06	Fri 22-09-30
155	100%	S08 Shediac Residential Installations (500 homes) Device selection / procu	Mon 19-11-25	Tue 21-08-31
159	100%	S11 NBP Cyber Security (appliance) ~ project closed	Mon 20-01-06	Wed 21-06-30
162	70%	S12 Customer Facing Systems (Presentment/MDM)	Fri 19-10-25	Tue 22-05-31
166	76%	S09 ESP Integration - NB Internal System Design/Development	Mon 20-01-13	Fri 23-03-31
167	100%	Enterprise Service Bus Initial Integrations	Mon 20-01-13	Fri 20-05-29
170	100%	R3a - NBP Systems	Thu 21-02-25	Fri 21-04-30
180	72%	R3b - NBP Systems	Mon 21-10-25	Fri 23-03-31
191	0%	R3c - NBP Systems	Mon 23-01-23	Tue 23-02-28
197	81%	ESP/MCP Deployment	Fri 19-08-09	Fri 23-08-04
198	100%	ESP SW R1 Deployment	Fri 19-08-09	Thu 20-07-23
214	100%	ESP SW R2 Deployment and System Integration	Tue 20-03-10	Wed 21-01-06
233	67%	ESP/MCP SW R3 Deployment and System Integration	Mon 20-11-30	Fri 23-08-04
261	83%	S10 Program Implementation Post-Build Engineering and Business Model St	Fri 19-11-22	Fri 23-06-30
262	100%	Shediac Baseline Data Collection	Fri 19-11-22	Wed 20-12-30
264	100%	Shediac Pilot Period 1a (ties to r2b)	Wed 21-02-10	Wed 21-02-10
266	100%	Shediac Pilot Period 1b (ties to 3a)	Wed 21-12-22	Wed 21-12-22
268	100%	Shediac Pilot Period 2 (ties to 3b)	Mon 22-09-26	Mon 22-09-26
270	0%	Shediac Pilot Period 3 (ties to 3c)	Fri 22-12-02	Fri 22-12-02
272	75%	Run SGA DER Programs	Wed 21-02-10	Fri 23-06-30
273	91%	Smart Grid Nova Scotia Demonstration	Fri 19-06-28	Thu 23-03-02
274	100%	UARB Filing and Approvals	Fri 19-12-06	Wed 20-07-22
278	100%	Smart Grid NS Customer Recruitment, Program Design	Mon 20-04-13	Thu 21-09-30
289	96%	Smart Grid NS Prim Engineering/Procurement	Fri 19-06-28	Wed 22-10-26
337	98%	Smart Grid NS Infrastructure/Implementation	Tue 20-01-07	Wed 22-12-14
338	100%	Electric Vehicle Chargers (EVSE-CP)	Tue 20-05-26	Wed 21-12-01
344	99%	Distributed Battery (SV)	Tue 20-09-15	Tue 22-10-04
351	91%	Distributed Battery (T)	Thu 21-04-08	Fri 22-10-14
355	100%	Community Solar Garden	Tue 20-01-07	Thu 21-12-23
382	80%	C&I Solar+Battery	Tue 21-11-02	Wed 22-12-14
400	90%	ESP Deployment	Fri 19-08-09	Fri 22-12-02
401	100%	ESP SW R1 Deployment	Fri 19-08-09	Thu 20-10-08
417	100%	ESP SW R2 Deployment and System Integration	Tue 20-03-10	Wed 21-01-06
436	78%	ESP/MCP SW R3 Deployment and System Integration	Mon 20-11-30	Fri 22-12-02
464	60%	Smart Grid NS Post-Build Engineering and Business Model Studies	Wed 20-04-01	Thu 23-03-02
465	100%	Baseline Data Collection (only C&I from within utility)	Wed 20-04-01	Mon 20-11-30
467	52%	NS Power Pilot Period 1	Wed 21-01-27	Thu 23-03-02
471	18%	NS Power Pilot Period 2	Fri 22-08-05	Wed 22-11-23
475	48%	North Branch Demonstration (project being closed)	Mon 20-02-03	Fri 23-12-22
476	26%	North Branch Program Agreements/Stakeholder/Customer Engagement Rea	Fri 20-03-27	Fri 23-12-22
486	63%	North Branch Design/Infrastructure	Mon 20-02-03	Wed 23-03-29
516	42%	ESP/MCP Deployment	Mon 21-03-15	Fri 23-09-01
546	93%	Program Governance and Management	Fri 19-01-25	Fri 23-03-31
547	93%	PMO Governance and Project Management	Fri 19-01-25	Fri 23-03-31

Smart Grid Program

Per the quarterly claim due date indicated in Schedule C of the Contribution Agreement, and using this template, recipients of Smart Grid Deployment Program funding must provide a claim, an updated budget forecast and project task updates.

Project Name:	Collaborative Grid Innovation for Atlantic Smart Energy
Project ID:	GISG-3085
Proponent Company Name:	Nova Scotia Power
Claim number:	10
Expenses for Quarter Ending on:	2022-23

	Costs Incurred	Costs Expected Next Quarter
ELIGIBLE EXPENDITURES		
Salaries and Benefits	$ 67,755.35	$ 60,648.12
Overhead	$ 135,229.51	$ 74,829.00
Professional, Scientific and Contracting Services*	$ 873,149.81	$ 147,070.37
Travel, including Meals and Accomodations	$ 2,649.52	$ 527.48
Equipment and Products**	$ 27,557.55	$ 56,149.01
Other expenses***	$ 1,065.41	$ 75.00
Total Eligible Expenditures	**$ 1,107,407.15**	**$ 339,298.98**

INELIGIBLE EXPENDITURES		
Salaries and Benefits		
Overhead		
Professional, Scientific and Contracting Services*	$ -	
Travel, including Meals and Accomodations		
Equipment and Products**	$ -	
Other expenses***	$ -	
Total Ineligible Expenditures	$ -	$ -

To be completed by Program Staff

TOTAL PROJECT COSTS	$ 1,107,407.15	$ 339,298.98
Smart Grid Deployment Contribution (this quarter)	$ -	
Less 25% holdback (in contribution agreement)	$ -	
DEPLOYMENT CLAIM PAYMENT AMOUNT	$ -	
Smart Grid Demonstration Contribution (this quarter)	$	
Less holdback % in contribution agreement	$	
DEMONSTRATION CLAIM PAYMENT AMOUNT	$	

** Complete "Professional, Scientific and Contracting Services" worksheet*

*** Complete "Equipment and Products" worksheet*

**** Complete "Other Expenses" worksheet*

NOTE 1: *For Eligible Expenditures under the "Equipment and Products" category, or contracting services related to the purchase of equipment, materials, or products, any claim greater than $100,000 must be supported by a copy of the invoice.*

NOTE 2: *For Eligible Expenditures under all other categories, any claim greater than $50,000 must be supported by a copy of the invoice.*

NOTE 3: *For the Eligible Expenditures above, the Proponent can include the Goods and Services Tax (GST), Harmonized Sales Tax (HST) and Provincial Sales Tax (PST) costs paid on their project invoices, provided it's net of any tax rebate to which the Proponent is entitled. Program reimbursement for these taxes is also dependent on completion of the* ***Certification for the Treatment of GST, PST and HST*** *form provided by the Program.*

Professional, Scientific and Contracting Services

Note: Expenses above $50,000 must be supported by a copy of the invoice.

ELIGIBLE EXPENDITURES		
Name of the contractor	**Description of the work**	**Costs Incurred**
W MCNEIL CONTRACTING LIMITED	Installation of distributed batteries	$ [redacted]
BLACK AND MCDONALD LTD	Installation of distributed batteries (multiple sites & invoices)	$ [redacted]
EVERGREEN ELECTRIC	Installation of distributed batteries (multiple sites & invoices)	$ [redacted]
PROFESSIONAL QUALITY ASSURANCE LIMITED	ESP testing planning and test support resource (multiple invoices)	$ [redacted]
NOVA COMMUNICATIONS	Subject matter expert to help install required LTE modems at C&I project sites	$ [redacted]
CLOTHESLINE MEDIA INC.	Create timelaps video for Smart Grid projects	$ [redacted]
GP JOULE PV CANADA CORP	Installation of Battery Energy Storage System (BESS) at site 3	$ [redacted]
CONTRACTED RESOURCE: K. SMITH	Site supervision on behalf of NS Power for C&I work being carried out at two sites (multiple invoices)	$ [redacted]
GP JOULE PV CANADA CORP	Site 1 contingency for C&I battery + solar component of Smart Grid projects (multiple invoices)	$ [redacted]
GP JOULE PV CANADA CORP	Site 3 contingency for C&I battery + solar component of Smart Grid projects (multiple invoices)	$ [redacted]
GP JOULE PV CANADA CORP	Installation of Battery Energy Storage System (BESS) at site 1	$ [redacted]
NATIONAL PUBLIC RELATIONS INC	Professional fees for Community Solar Garden feedback via Mailchimp	$ [redacted]
NATURAL FORCES SOLAR INC.	Additional required planned scope work for Community Solar Garden project (multiple invoices)	$ [redacted]
DAVID CLARKE TRUCKING	Snow removal at Amherst Community Solar Garden	$ [redacted]
NATURAL FORCES SOLAR INC.	Finishing holdback	$ [redacted]
NEWMAN ELECTRIC CO INC	Installation of distributed batteries (multiple sites & invoices)	$ [redacted]
GP JOULE PV CANADA CORP	Site 2 contingency for C&I battery + solar component of Smart Grid projects	$ [redacted]
HARBOUR CONSTRUCTION CO LTD	Removal and delivery of gravel at C&I battery + solar project component	$ [redacted]
SILVERTECH INC.	Code review and user experience work for Community Solar Garden digital tools	$ [redacted]
CLOTHESLINE MEDIA INC.	PO for bi-directional charging video production through Smart Grid ESP project component	$ [redacted]
SIEMENS CANADA LTD	Develop extension module for Desigo CC V5 and configure connection exisiting Site BMS & ESP	$ [redacted]
ROCKWOOD NETWORK CONSULTING	Consulting work through Rockwood Network for Smart Grid ESP project component	$ [redacted]
GP JOULE PV CANADA CORP	Installation of Battery Energy Storage System (BESS) at site 2	$ [redacted]
NATURAL FORCES SOLAR INC.	SCADA system study for Amherst Community Solar Garden	$ [redacted]
Total Eligible *Professional, Scientific and Contracting Services* Costs		**$ 873,149.81**

INELIGIBLE EXPENDITURES		
Name of the contractor	**Description of the work**	**Costs Incurred**
Total Ineligible *Professional, Scientific and Contracting Services* Costs		**$ -**

Equipment and Products

Note: *Expenses above $100,000 for equipment, materials, or products (or contracting services related to these purchases) must be supported by a copy of the invoice.*

ELIGIBLE EXPENDITURES		
Name of Equipment or Product	**Purpose of Item**	**Costs Incurred**
Black and McDonald Ltd - installation materials	Distributed battery installation materials (multiple invoices)	$ [redacted]
Evergreen Electric - installation materials	Distributed battery installation materials (multiple invoices)	$ [redacted]
Newman Electric Co - installation materials	Distributed battery installation materials	$ [redacted]
Bird Barrier America - bird deterrent system	Supply the Eagle Eye Open Area Infestation Reduction System to	$ [redacted]
Natural Forces Solar Inc - delivery	All major equipment delivered to site (multiple invoices)	$ [redacted]
Bell Mobility - equipment rental	Standing PO for 2022 Smart Grid charges (multiple invoices)	$ [redacted]
Total Eligible *Equipment and Products* Costs		**$ 27,557.55**

INELIGIBLE EXPENDITURES		
Name of Equipment or Product	**Purpose of Item**	**Costs Incurred**
Total Ineligible *Equipment and Products* Costs		**$ -**

Other Expenses

Note: *Expenses above $50,000 must be supported by a copy of the invoice*

ELIGIBLE EXPENDITURES		
Type of Other Expense*	**Description of Item**	**Costs Incurred**
Freight, Postage & Delivery	Taxes and duties - distributed battery project component	$ [redacted]
Freight, Postage & Delivery	Shipping charges (Bird Barrier America) - C&I solar + battery project component	$ [redacted]
Personal Protective Equipment	Flame retardant safety jacket - C&I solar + battery project component	$ [redacted]
Total Eligible *Other Expenses*		**$ 1,065.41**

INELIGIBLE EXPENDITURES		
Type of Other Expense*	**Description of Item**	**Costs Incurred**
Total Ineligible *Other Expenses*		**$ -**

** "Other Expenses" can include: 1) Field supplies and materials; 2) Printing services and translation; 3) Data collection services, including processing, analysis and management; 4) Facility expenses for seminars, conference room rentals, etc. (excluding hospitality); 5) License fees and permits; and 6) Field testing services.*

Certification and Project Update

Project Update - Provide updates on key project tasks performed during last quarter

Attach in a separate document the key project tasks completed and expected in the next quarter and describe how they align with the tasks identified in Schedule A of the contribution agreement. Also, please provide information about any project related issues and how they are being addressed. Bullet form is acceptable.

Included in Integro submission

Was an environmental permit required for project activities this quarterly period to **June 30. 2022** No

If yes, was the environmental permit(s) obtained?

I, Shawn Connell, a duly authorized officer of Nova Scotia Power certify that the amounts claimed are correct. (Sign and date below)

Shawn Connell Digitally signed by Shawn Connell
Date: 2022.10.14 06:52:48 -03'00'

Date: 10/14/22
Name: Shawn Connell
Title: Director, Customer Solutions & Key Accounts

Submit quarterly claim package to: nrcan.sg-ri.rncan@canada.ca

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

1 – PROJECT INFORMATION

Case File Number	GI-SG-134
Program	Green Infrastructure – Smart Grids
Proponent	Nova Scotia Power Inc.
Project Title	Collaborative Grid Innovation for Atlantic Smart Energy Communities
Fiscal Year	2022/23
Reporting Period	Q1 (Apr to Jun)
Submission Date	Fri, 14 Oct 2022

2 – OVERALL PROJECT PROGRESS

Please enter the project timing and scope status. The baseline schedule is as defined in the last approved agreement with NRCan. If the project timing and scope are not on target, please explain in the description sections.

Project Timing Status:	(choose one)
Within last approved baseline schedule	☐
Behind baseline schedule – no major impact on project (i.e. does not affect project critical path)	☒
Behind baseline schedule – major impact on project (i.e. affects the critical path, scope or budget objectives, or operational requirements)	☐

Project Scope Status:	(choose one)
No change or impact on project (i.e. change within the budget and baseline schedule)	☒
Minor change – little impact on project (i.e. change impacts budget or schedule but is still within the scope as defined in the approved agreement, does not affect the critical path schedule, and does not require an amendment)	☐
Important change – significant impact on project (i.e. major effect on budget and/or the critical path schedule is at risk; an amendment is likely required)	☐

Percentage of total tasks completed to date 75 %

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

Overall summary of project status and achievements in this reporting period –

ESP Development

- Initial EVSE use cases continue to be executed. Additional integration functionality and remaining use cases are in development.
- Initial BMS Time Shifting use case executed in test environment in February during "peak" calendar period.
- Residential and commercial battery systems integration development and initial baseline data collection is ongoing.

NS Power Program Design

- The Solar Garden Rate Rider was amended in March 2022 to allow for subscriptions by increments as small as 0.25kW. Energy generated for subscribing customers began on 1 February 2022. At the end of the reporting period, there were 166 subscribers, for 1,153.75 kWdc of capacity.
- ev.energy EV Smart Charging expansion was launched in June 2022. Eligible customers who enroll will be paid $20/month for their participation. Testing will begin in Q3 2022.

Community Solar

- Insulation work undertaken to protect the electronics (i.e. e-house) from cold weather conditions and reduce energy consumption for heating
- Solar Garden is operational and has been delivering energy since the beginning of 2022
- Ongoing measurement, data collection and analysis, and monitoring of the site continues

C&I Solar + Battery

- One ground mount and the rooftop solar installation have been energized and operational. There is now one ground mount site remaining for energization, which is the final site.
- Civil and Electrical Asbuild drawings have been provided for review.
- Two BESS (Battery Energy Storage System) installations have been completed and energized; there is now one final site remaining.
- Additional reverse power flow hardware and programming added to system design in order to prevent export to grid at C&I sites, per interconnection agreements. Initial design and implementation work was ongoing during this reporting period.

Operational issues and other barriers/challenges in this reporting period –

ESP Operations

- Minor software and integration bugs were found during testing and resolution is ongoing between the Development and QA teams, and Vendors.
- Mitigation of these issues through use of Vendor portals to correlate data with ESP.

Community Solar

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

- The Community Solar Garden experienced a three-day outage in June, caused by a faulty piece of equipment. The garden was recommissioned, and permanent repairs are expected in Autumn 2022.
- Net solar production was 13% below target - largely attributable to colder months. Insulation on the e-house was scheduled, and undertaken, in August 2022.

Residential Batteries

- Site visits were required to conduct firmware updates to some battery systems.
- Request made to Vendor for updates to its customer-facing portal to improve performance data accuracy.

2A – OVERALL PROJECT PROGRESS ATTACHMENT (OPTIONAL)

n/a

3 – PROJECT BUDGET & FINANCIALS

Please enter the Budget Status. A project is considered to be "On Budget" if the final expenditure is within the budget as set out in the approved agreement with NRCan.

Project Budget Status:	(choose one)
On budget (i.e. forecasted expenditure follows the budget as planned)	☒
Forecasted expenditures by any nature of cost is greater than 20% above or below the approved budget, but no changes are required to NRCan funding, either the amount or annual funding distribution (i.e. no amendment required)	☐
Forecasted expenditures exceeds or falls short of approved budget such that the project may be at risk, or a change in either the amount or annual distribution of NRCan funding is required (i.e. amendment to budget is likely required)	☐

Requested advance for next reporting period (if applicable) $ 0.00

Budget description –

Summary of project costs for NS Power's Smart Grid program is provided in the Excel document.

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

4 – WEB HIGHLIGHTS (OPTIONAL)

Please provide one to two short paragraphs highlighting progress on the project this reporting period. It will be used to update the project web page on the Government of Canada's website.

Title of Highlight	Details & Description of Highlight
n/a	n/a

4A – WEB HIGHLIGHTS ATTACHMENTS (OPTIONAL)

Please see the following requirements and fill out the table for each photo

- upload high-res photos in *.jpg format
- include a caption for each image
- include a detailed text description of the image; this description will be used by the visually-impaired and should be fairly detailed (i.e. a few sentences)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

5 – KNOWLEDGE & MEDIA PRODUCTS (OPTIONAL)

Please provide a list of knowledge and media products such as: patent awarded, licence, code & standard, policy, regulation, peer reviewed paper, other technical paper, conference presentation, media release, news coverage, site tour, other media, and other knowledge product.

Title of Highlight	Details & Description of Highlight
n/a	n/a

5A – KNOWLEDGE & MEDIA PRODUCTS ATTACHMENTS (OPTIONAL)

Please see the following requirements and fill out the table for each photo

- upload high-res photos in *.jpg format
- include a caption for each image
- include a detailed text description of the image; this description will be used by the visually-impaired and should be fairly detailed (i.e. a few sentences)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

Smart Grid Program

Per the quarterly claim due date indicated in Schedule C of the Contribution Agreement, and using this template, recipients of Smart Grid Deployment Program funding must provide a claim, an updated budget forecast and project task updates.

Project Name:	Collaborative Grid Innovation for Atlantic Smart Energy	
Project ID:	GISG-3085	
Proponent Company Name:	Nova Scotia Power	
Claim number:	11	
Expenses for Quarter Ending on:	**September 30.**	**2022-23**

	Costs Incurred	Costs Expected Next Quarter
ELIGIBLE EXPENDITURES		
Salaries and Benefits	$ 60,648.12	$ 64,031.73
Overhead	$ 74,829.00	$ 77,823.90
Professional, Scientific and Contracting Services*	$ 303,902.83	$ 376,508.14
Travel, including Meals and Accomodations	$ 840.97	$ 446.88
Equipment and Products**	$ 56,479.58	$ 12,745.27
Other expenses***	$ 75.00	$ 8,076.18
Total Eligible Expenditures	**$ 496,775.50**	**$ 539,632.10**

INELIGIBLE EXPENDITURES		
Salaries and Benefits		
Overhead		
Professional, Scientific and Contracting Services*	$ -	
Travel, including Meals and Accomodations		
Equipment and Products**	$ -	
Other expenses***	$ -	
Total Ineligible Expenditures	$ -	$ -

To be completed by Program Staff

TOTAL PROJECT COSTS	$ 496,775.50	$ 539,632.10
Smart Grid Deployment Contribution (this quarter)	$ -	
Less 25% holdback (in contribution agreement)	$ -	
DEPLOYMENT CLAIM PAYMENT AMOUNT	$ -	
Smart Grid Demonstration Contribution (this quarter)	$	
Less holdback % in contribution agreement	$	
DEMONSTRATION CLAIM PAYMENT AMOUNT	$	

** Complete "Professional, Scientific and Contracting Services" worksheet*

*** Complete "Equipment and Products" worksheet*

**** Complete "Other Expenses" worksheet*

NOTE 1: *For Eligible Expenditures under the "Equipment and Products" category, or contracting services related to the purchase of equipment, materials, or products, any claim greater than $100,000 must be supported by a copy of the invoice.*

NOTE 2: *For Eligible Expenditures under all other categories, any claim greater than $50,000 must be supported by a copy of the invoice.*

NOTE 3: *For the Eligible Expenditures above, the Proponent can include the Goods and Services Tax (GST), Harmonized Sales Tax (HST) and Provincial Sales Tax (PST) costs paid on their project invoices, provided it's net of any tax rebate to which the Proponent is entitled. Program reimbursement for these taxes is also dependent on completion of the* ***Certification for the Treatment of GST, PST and HST*** *form provided by the Program.*

Professional, Scientific and Contracting Services

Note: Expenses above $50,000 must be supported by a copy of the invoice.

ELIGIBLE EXPENDITURES		
Name of the contractor	**Description of the work**	**Costs Incurred**
GP Joule PV Canada	Site 1 - Contingency (C&I Solar + Battery project) - multiple invoices	$ [redacted]
Black and MacDonald Ltd.	Installation of distributed batteries - multiple invoices	$ [redacted]
GP Joule PV Canada	Site 3 - Contingency (C&I Solar + Battery project) - multiple invoices	$ [redacted]
GP Joule PV Canada	Site 2 - Contingency (C&I Solar + Battery project) - multiple invoices	$ [redacted]
Spicer Electric Ltd.	Labour to install distributed batteries	$ [redacted]
Rockwood Network Consulting	Consulting work on ESP project - multiple invoices	$ [redacted]
Clothesline Media Inc.	Advertising / marketing work for ESP project	$ [redacted]
GP Joule PV Canada	Site 3 - Substantial completion (C&I Solar + Battery project)	$ [redacted]
Evergreen Electric	Installation of distributed batteries - multiple invoices	$ [redacted]
Professional Quality Assurance Ltd.	QA Lead to support the ESP project - multiple invoices	$ [redacted]
Kevin G. Smith	Site supervision at two C&I Solar + Battery project sites - multiple invoices	$ [redacted]
Siemens Canada Ltd.	Develop extension module for Desigo CC V5 & configure connection for Site existing BMS and ESP	$ [redacted]
GP Joule PV Canada	Site 1 - Substantial completion (C&I Solar + Battery project)	$ [redacted]
Mattatall Signs Ltd.	Smart Grid NS project branding wrap installed at 3 battery locations	$ [redacted]
Justin M Siddell	Labour to insulate e-house at Amherst Solar Garden	$ [redacted]
Dalhousie University	Modeling input for various DERs and use cases - Milestone 2	$ [redacted]
Dalhousie University	Modeling input for various DERs and use cases - Milestone 3	$ [redacted]
Total Eligible *Professional, Scientific and Contracting Services* Costs		**$ 303,902.83**

INELIGIBLE EXPENDITURES		
Name of the contractor	**Description of the work**	**Costs Incurred**
Total Ineligible *Professional, Scientific and Contracting Services* Costs		**$ -**

Equipment and Products

Note: *Expenses above $100,000 for equipment, materials, or products (or contracting services related to these purchases) must be supported by a copy of the invoice.*

ELIGIBLE EXPENDITURES

Name of Equipment or Product	Purpose of Item	Costs Incurred
Bell Mobility - equipment rental	Standing PO for distributed battery charges (multiple invoices)	$ [redacted]
Nova Communications - booster supply	Booster supply and installation at C&I customer premises	$ [redacted]
Personal protective equipment	Safety boot expenses for employee for on-site at C&I sites	$ [redacted]
Black and MacDonald - materials	Material for distributed battery installations - multiple invoices	$ [redacted]
Bell Mobility - SIM cards	110 SIM Cards connected to Bell Private APN for communications with field deployed DER devices	$ [redacted]
M Power Energy Solutions	Smart Grid ESP materials for 100A Gateway CT	$ [redacted]
GP Joule - modules & spares	SITE 2 - Modules (including 6 spares)	$ [redacted]
GP Joule - modules & spares	SITE 3 - Modules (including 5 spares)	$ [redacted]
Justin M Siddell - insulation materials	Material to insulate e-house at Amherst Solar Garden	$ [redacted]
Total Eligible *Equipment and Products* Costs		**$ 56,479.58**

INELIGIBLE EXPENDITURES

Name of Equipment or Product	Purpose of Item	Costs Incurred
Total Ineligible *Equipment and Products* Costs		**$ -**

Other Expenses

Note: *Expenses above $50,000 must be supported by a copy of the invoice*

ELIGIBLE EXPENDITURES		
Type of Other Expense*	**Description of Item**	**Costs Incurred**
Shipping	Shipping of materials for Smart Grid ESP from M Power Energy Solutions	$ [redacted]
Total Eligible *Other Expenses*		**$** [redacted]

INELIGIBLE EXPENDITURES		
Type of Other Expense*	**Description of Item**	**Costs Incurred**
Total Ineligible *Other Expenses*		**$ -**

** "Other Expenses" can include: 1) Field supplies and materials; 2) Printing services and translation; 3) Data collection services, including processing, analysis and management; 4) Facility expenses for seminars, conference room rentals, etc. (excluding hospitality); 5) License fees and permits; and 6) Field testing services.*

Certification and Project Update

Project Update - Provide updates on key project tasks performed during last quarter

Attach in a separate document the key project tasks completed and expected in the next quarter and describe how they align with the tasks identified in Schedule A of the contribution agreement. Also, please provide information about any project related issues and how they are being addressed. Bullet form is acceptable.

Included in Integro submission

Was an environmental permit required for project activities this quarterly period to **September 30. 2022** No

If yes, was the environmental permit(s) obtained?

I, Shawn Connell, a duly authorized officer of Nova Scotia Power certify that the amounts claimed are correct. (Sign and date below)

Shawn Connell Digitally signed by Shawn Connell
Date: 2022.12.21 10:22:39 -04'00'

Date: 12/21/22
Name: Shawn Connell
Title: Senior Director, Key Accounts & Customer Solutions

Submit quarterly claim package to: nrcan.sg-ri.rncan@canada.ca

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

1 – PROJECT INFORMATION

Case File Number	GI-SG-134
Program	Green Infrastructure – Smart Grids
Proponent	Nova Scotia Power Inc.
Project Title	Collaborative Grid Innovation for Atlantic Smart Energy Communities
Fiscal Year	2022/23
Reporting Period	Q2 (Jul to Sep)
Submission Date	Fri, 30 Dec 2022

2 – OVERALL PROJECT PROGRESS

Please enter the project timing and scope status. The baseline schedule is as defined in the last approved agreement with NRCan. If the project timing and scope are not on target, please explain in the description sections.

Project Timing Status:	(choose one)
Within last approved baseline schedule	☐
Behind baseline schedule – no major impact on project (i.e. does not affect project critical path)	☒
Behind baseline schedule – major impact on project (i.e. affects the critical path, scope or budget objectives, or operational requirements)	☐

Project Scope Status:	(choose one)
No change or impact on project (i.e. change within the budget and baseline schedule)	☒
Minor change – little impact on project (i.e. change impacts budget or schedule but is still within the scope as defined in the approved agreement, does not affect the critical path schedule, and does not require an amendment)	☐
Important change – significant impact on project (i.e. major effect on budget and/or the critical path schedule is at risk; an amendment is likely required)	☐

Percentage of total tasks completed to date 80 %

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

Overall summary of project status and achievements in this reporting period –

ESP Development

- Continued execution of the initial electric vehicle supply equipment (EVSE) use cases. Development has been completed to enable automation of use cases based on business system and operational data.
- Progress continued in the development of initial baseline data collection and system integrations for three different residential and commercial battery systems.

NS Power Program Design

- On 22 August, the Community Solar Garden sold out of residential capacity (1,200 kWdc) for the first time. As of 30 September, there were total of 177 subscribers for 1,206 kWdc of capacity.

Community Solar

- Insulation work on the e-house has been completed, and will be monitored for performance during the 2022/23 winter season.
- Ongoing measurement, data collection and analysis, and monitoring of the site continues.

C&I Solar + Battery

- Two of three solar installations were energized in the reporting period, with the final site scheduled to be energized in the next quarter.
- Civil and Electrical As build drawings have been reviewed and stamped.
- Two of three Battery Energy Storage System (BESS) installations were energized; the final site is planned to be energized by the end of the next quarter.

Operational issues and other barriers/challenges in this reporting period –

ESP Development

- Minor software and integration bugs were found during testing and resolution is ongoing between the Development and QA teams, and Vendors.
- Resolution of integration defects including constraint management and connectivity to third-party vendor clouds.
- Additional functionality being delivered to enable data extract for analysis in external platforms.

Community Solar

- Hurricane Fiona impacted the Community Solar Garden between 23 & 24 September. Once conditions were deemed safe, a preliminary damage assessment found 21 solar modules with substantial damage. Miscellaneous pieces of the mechanical balance of systems were also found to be either loosened or damaged; however, the main electrical infrastructure was unharmed.
- During the following week, the site was cleared of damaged equipment and debris, repairs were completed, and the site was brought back fully on Friday, 30 September.

- Net solar production was 8% above target in July, on target in August, and 10% below target in September – largely attributable to the impact of Fiona.

C&I Solar + Battery

- Discussions with NS Power's interconnection engineer to temporarily disable zero export mode during use case testing continued in the reporting period. Disabling this mode will enable the testing of smart functions for solar inverters. A procedure on how to enable and disable zero export mode and functionality will be provided to the system operator.

Residential Batteries

- During extreme weather events, battery systems enable a 'storm mode' which signals the batteries to quickly recharge in preparation for potential power outages. From a customer perspective, this is a favourable feature. However, following grid restoration, a surge in the demand profile triggered by batteries recharging at maximum rate capacity could have an impact on the cold load pickup aggregate, which the team is currently investigating.
- Some residential batteries have experienced a communication loss error. This was discussed with the manufacturer and has been addressed by replacing the communication cable with a twisted pair shielded data cable (600V rated) to improve the communication on the battery systems affected.
- After Hurricane Fiona, a customer witnessed a fire incident on their roof where a solar array was recently installed and integrated with their battery system.
    - The fire originated from a switching device installed under a solar module and was quickly extinguished with no damage to the customer's property, other than to one solar panel and the faulty device.
    - The system was taken out of operation and a proper investigation was conducted with the product manufacturer. The root cause of damage was found to be water intrusion due to sealing failure and heavy rain exposure during Fiona.
    - The faulty device will be replaced with an updated model with significant quality improvements and verification tests will be performed to eliminate potential fire incidents due to equipment failure.
    - No additional program participants are using the faulty device.

2A – OVERALL PROJECT PROGRESS ATTACHMENT (OPTIONAL)

n/a

3 – PROJECT BUDGET & FINANCIALS

Please enter the Budget Status. A project is considered to be "On Budget" if the final expenditure is within the budget as set out in the approved agreement with NRCan.

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

Project Budget Status:	(choose one)
On budget (i.e. forecasted expenditure follows the budget as planned)	☒
Forecasted expenditures by any nature of cost is greater than 20% above or below the approved budget, but no changes are required to NRCan funding, either the amount or annual funding distribution (i.e. no amendment required)	☐
Forecasted expenditures exceeds or falls short of approved budget such that the project may be at risk, or a change in either the amount or annual distribution of NRCan funding is required (i.e. amendment to budget is likely required)	☐

Requested advance for next reporting period (if applicable) $ 0.00

Budget description –

Summary of project costs for NS Power's Smart Grid program is provided in the Excel document.

4 – WEB HIGHLIGHTS (OPTIONAL)

Please provide one to two short paragraphs highlighting progress on the project this reporting period. It will be used to update the project web page on the Government of Canada's website.

Title of Highlight	Details & Description of Highlight
n/a	n/a

4A – WEB HIGHLIGHTS ATTACHMENTS (OPTIONAL)

Link to SharePoint for photos – please see the following requirements and fill out the table for each photo

- upload high-res photos in *.jpg format
- include a caption for each image
- include a detailed text description of the image; this description will be used by the visually-impaired and should be fairly detailed (i.e. a few sentences)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

NATURAL RESOURCES CANADA

SGNS Financial & Status Report

5 – KNOWLEDGE & MEDIA PRODUCTS (OPTIONAL)

Please provide a list of knowledge and media products such as: patent awarded, licence, code & standard, policy, regulation, peer reviewed paper, other technical paper, conference presentation, media release, news coverage, site tour, other media, and other knowledge product.

Title of Highlight	Details & Description of Highlight
n/a	n/a

5A – KNOWLEDGE & MEDIA PRODUCTS ATTACHMENTS (OPTIONAL)

Link to SharePoint for photos – please see the following requirements and fill out the table for each photo

- upload high-res photos in *.jpg format
- include a caption for each image
- include a detailed text description of the image; this description will be used by the visually-impaired and should be fairly detailed (i.e. a few sentences)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

2022-23	Q1 1er trim.	Q2 2e trim.	Q3 3e trim.	Q4 4e trim.	ADJUSTMENT Ajustement	CUMMULATIVE Cumulatif	CA BUDGET Budget AC	AMENDMENT Amendement	CURRENT BUDGET Budget actuel	% BUDGET SPENT % Budget utilisé	
Nova Scotia Power EVID 1017								Admin Amendment 1	1		
ELIGIBLE EXPENDITURES/ DÉPENSES ADMISSIBLES											
SALARIES AND BENEFITS/ Salaires et avantages sociaux	$ 2,710.66					$ 2,710.66				0%	
*OVERHEAD/ Frais généraux	$ 2,079.71					$ 2,079.71				0%	
PROFESSIONAL, SCIENTIFIC AND CONTRACTING SERVICES/ Services professionels, scientifiques et contractuels	$ 9,257.50					$ 9,257.50				0%	
TRAVEL INCLUDING MEALS AND ACCOMODATIONS/ Frais de déplacements, de repas et d'hébergement	$ -					$ -				0%	
EQUIPMENT AND PRODUCTS/ Equipements et matériaux	$ 24,125.45					$ 24,125.45				0%	
OTHER EXPENSES/ Autres dépenses	$ 50,792.52					$ 50,792.52			$ -	0%	
Total Eligible Expenditures	**$ 88,965.84**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 88,965.84**	**$ -**	**$ -**	**$ -**	**0%**	
INELIGIBLE EXPENDITURES/ COÛTS NON ADMISSIBLES											
SALARIES AND BENEFITS/ Salaries et advantages sociaux						$ -			$ -	0%	
OVERHEAD/ Frais généraux						$ -	$ 24,379.00		$ -	0%	
PROFESSIONAL, SCIENTIFIC AND CONTRACTING SERVICES/ Services professionels, scientifiques et contractuels						$ -			$ -	0%	
TRAVEL INCLUDING MEALS AND ACCOMODATIONS/ Frais de déplacements, de repas et d'hébergement						$ -			$ -	0%	
EQUIPMENT AND PRODUCTS/ Equipements et matériaux						$ -	$ 50,000.00		$ -	0%	
OTHER EXPENSES/ Autres dépenses						$ -			$ -	0%	
TOTAL INELIGIBLE EXPENDITURES/ Coûts non admissibles totaux	$ -	$ -	$ -	$ -	$ -	$ -	$ 74,379.00	$ -	$ -	0%	
IN KIND CONTRIBUTIONS/ CONTRIBUTION EN NATURE											
IN KIND CONTRIBUTIONS/ Contribution en nature	$ -					$ -					
TOTAL PROJECT COSTS/ Coûts totaux du projet	$ 88,965.84	$ -	$ -	$ -	$ -	$ 88,965.84	$ 74,379.00	$ -	$ -		
PROGRAM'S $ SHARE (AMOUNT CLAIMED)/ part du programme				$ -		$ -	$ 226,202.00		$ -	$ -	
PROGRAM'S % of ELIGIBLE / % des coûts admissibles du programme	0%	0%	0%	0%		0%	0%	0%	0%		
PROGRAM'S % of TOTAL PROJECT COSTS/ % des coûts totaux du projet du programme	0%	0%	0%	0%		0%	304%	0%	0%		
SITUATIONAL HOLDBACK WITHHELD (Stacking, CA, etc.)						$ -					
HOLDBACK RELEASED						$ -					
FUNDS AVAILABLE FOR RELEASE	$ -	$ -	$ -	$ -		$ -					
STANDARD HOLDBACK WITHHELD (10%)	$ -	$ -	$ -	$ -		$ -					
AMOUNT PAID/ montant payé	$ -	$ -	$ -	$ -		$ -					
*Must be <15% of eligible expenditures /moins à 15% des dépenses éligibles		NAME OF PROJECT/ Nom du project:	EVID-1017 Nova Scotia Vehicle Integration Pilot								
		SIGNED BY/ Signé par:	Shawn Connell, Diretor Key Accounts & Customer Solutions					SIGNATURE:	Shawn Connell		

NATURAL RESOURCES CANADA

EVID Financial & Status Report

1 – PROJECT INFORMATION

Case File Number	GI-EVID-192
Program	Green Infrastructure – EVID
Proponent	Nova Scotia Power Inc.
Project Title	Nova Scotia Vehicle Grid Integration Pilot
Fiscal Year	2022/23
Reporting Period	Q1 (Apr to Jun)
Submission Date	Fri, 14 Oct 2022

2 – OVERALL PROJECT PROGRESS

Please enter the project timing and scope status. The baseline schedule is as defined in the last approved agreement with NRCan. If the project timing and scope are not on target, please explain in the description sections.

Project Timing Status:	(choose one)
Within last approved baseline schedule	☐
Behind baseline schedule – no major impact on project (i.e. does not affect project critical path)	☒
Behind baseline schedule – major impact on project (i.e. affects the critical path, scope or budget objectives, or operational requirements)	☐

Project Scope Status:	(choose one)
No change or impact on project (i.e. change within the budget and baseline schedule)	☒
Minor change – little impact on project (i.e. change impacts budget or schedule but is still within the scope as defined in the approved agreement, does not affect the critical path schedule, and does not require an amendment)	☐
Important change – significant impact on project (i.e. major effect on budget and/or the critical path schedule is at risk; an amendment is likely required)	☐

Percentage of total tasks completed to date 80 %

NATURAL RESOURCES CANADA

EVID Financial & Status Report

Overall summary of project status and achievements in this reporting period –

EV Smart Chargers

- No change from previous report, which reported all 100 EV smart chargers installed in customer homes and connected to the smart grid program at the end of 2021.
- Use case testing continues through this, and future, reporting periods.

Bi-directional Chargers

- Coritech charger: completed testing report throughout March 2022; evaluation of the testing results is ongoing. Additional testing, for Load Levelling and Generation Contingency use cases, commenced in August 2022. NS Power is conducting this use case testing remotely.
- One site (NSCC Institute of Technology Campus) has completed all required service upgrades and is prepared for the dcbel (formerly Ossiaco) bi-directional charger. This charger is experiencing UL certification delays and, as noted in the Operational Issues section, anticipated delivery dates have been pushed into the 2023 calendar year. Further scoping for installation is underway.
- NS Power has scheduled the installation of the Fermata 15kW bi-directional charger for October 2022 and anticipates this project will be completed by the end of October.

ev.energy

- ev.energy program launched 14 June 2022 to eligible customers. Approximately 60 drivers were onboarded immediately following the launch, and about 40 existing Tesla drivers were transitioned from the ChargePoint pilot to ev.energy.
- NS Power will work with Tesla drivers to continue this transition to alleviate integration challenges between Tesla vehicles and the OpenADR signal from ChargePoint.
- Testing began in July, with iterations throughout the quarter and into the Autumn 2022. More details will be available in the next report.

ESP Development

- Continued execution of initial EVSE use cases, and collection/capture of additional seasonal baseline data. Additional functionality through integration including forecasting and opt-out data is in development.
- ESP development is ongoing to enable remaining wind-following & system reliability use cases.

Operational issues and other barriers/challenges in this reporting period –

Bi-directional Chargers

- Supply delays relating to certification requirements for the additional bi-directional chargers persisted in the April to June 2022 reporting period. The certification requirements also result in delivery delays, with the expected delivery now cited for Q2/Q3 (i.e. at least April and by September) of 2023.
- The delay in availability and delivery of this bi-directional charger availability continues to remain a concern. In response, NS Power canceled one of its purchase orders for this device.

NATURAL RESOURCES CANADA

EVID Financial & Status Report

ev.energy and ChargePoint

- Ongoing troubleshooting with ChargePoint charger network connectivity, including replacements of units that have failed networking.

ESP Development

- ChargePoint backend configuration required an update to prevent a specific behavior that resulted in multiple notifications sent to customers. These notifications were triggered by an incorrect process being followed within ESP. A future software update will address this more formally.

2A – OVERALL PROJECT PROGRESS ATTACHMENT (OPTIONAL)

n/a

3 – PROJECT BUDGET & FINANCIALS

Please enter the Budget Status. A project is considered to be "On Budget" if the final expenditure is within the budget as set out in the approved agreement with NRCan.

Project Budget Status:	(choose one)
On budget (i.e. forecasted expenditure follows the budget as planned)	☒
Forecasted expenditures by any nature of cost is greater than 20% above or below the approved budget, but no changes are required to NRCan funding, either the amount or annual funding distribution (i.e. no amendment required)	☐
Forecasted expenditures exceeds or falls short of approved budget such that the project may be at risk, or a change in either the amount or annual distribution of NRCan funding is required (i.e. amendment to budget is likely required)	☐

Requested advance for next reporting period (if applicable) $ 0.00

Budget description –

Due to vendor delays, the planned spend was delayed. However, NS Power anticipates full budget spend within the 2022-23 fiscal year. NS Power will discuss any potential changes related to vendor delays with NRCan as more information becomes available. Summary of project costs for NS Power's Smart Grid program is provided in the Excel document.

NATURAL RESOURCES CANADA

EVID Financial & Status Report

4 – WEB HIGHLIGHTS (OPTIONAL)

Please provide one to two short paragraphs highlighting progress on the project this reporting period. It will be used to update the project web page on the Government of Canada's website.

Title of Highlight	Details & Description of Highlight
n/a	n/a

4A – WEB HIGHLIGHTS ATTACHMENTS (OPTIONAL)

Please see the following requirements and fill out the table for each photo

- upload high-res photos in *.jpg format
- include a caption for each image
- include a detailed text description of the image; this description will be used by the visually-impaired and should be fairly detailed (i.e. a few sentences)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

5 – KNOWLEDGE & MEDIA PRODUCTS (OPTIONAL)

Please provide a list of knowledge and media products such as: patent awarded, licence, code & standard, policy, regulation, peer reviewed paper, other technical paper, conference presentation, media release, news coverage, site tour, other media, and other knowledge product.

Title of Highlight	Details & Description of Highlight
n/a	n/a

5A – KNOWLEDGE & MEDIA PRODUCTS ATTACHMENTS (OPTIONAL)

Please see the following requirements and fill out the table for each photo

- upload high-res photos in *.jpg format
- include a caption for each image
- include a detailed text description of the image; this description will be used by the visually-impaired and should be fairly detailed (i.e. a few sentences)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

Select preferred language / Sélectionnez votre langue préférée
English



Strategic Innovation Fund FY 2021-22 Annual Performance Benefits Report (APBR)

Thank you for your participation in the SIF program. The investments being made through your project and others like it are generating meaningful results for Canada and for Canadians. Innovation Canada is proud to be a co-investor on these projects.

The Annual Performance Benefits Report (APBR) is an important exercise. The data gathered through this questionnaire will let us measure the benefits generated by SIF-funded projects and report on how the program is meeting its objectives of generating high-quality jobs, fostering growth, and helping companies to innovate.

The Annual Performance Benefits Report data will also help SIF effectively communicate to Canadians the impact that our co-investments are having on Canada's economy. Along with other sources of information, this data is critical to helping build the case for the ongoing relevance of the program.

Please consult the Guidance and Definitions links (beside each section of the questionnaire) for general instructions on how to complete this questionnaire, as well as guidance around specific sections.

Note that data provided on the Annual Performance Benefits Report will not be published, except at an aggregate level to speak to the impact of the SIF program at a high level. All information provided will be treated as business confidential. It will not be shared outside the Government of Canada without your consent and data will only be published at a highly-aggregated level. Please be assured that if we do receive an access to information request regarding your company, we will not release any confidential information. You will always be consulted prior to any third party information related to your company being released under an access to information request (unless this information is already public).

Note also that if needed, estimates are acceptable on the APBR for data that are not readily available.

APBR FAQ and General Guidance

Begin Questionnaire

← Previous

Project and Client Data

Need Help? Refer to the Guidance and Definitions

Client Data

Client Details

		Notes / Comments (Please note if estimates and/or different definitions of concepts were used from the APBR definitions)
Business or Institution's legal name	Nova Scotia Power Incorporated	
Business or Institution's operating name	Nova Scotia Power Incorporated	
Business Number (i.e., Canada Revenue Agency Number)	647281607	
Select your client type	(3) Main Partner (Partnership / Network / Consortium projects)	
Select your client status	(1) For-profit	
Percentage of Canadian ownership (for-profit clients only) (for example, Input 100 for fully Canadian-owned or 0 for fully foreign-owned)		
Select the month in which your business or institution's fiscal year ends.		
Month	(12) December	
Based on your selection above, this APBR must reflect information between the following dates:		
(Automatic) Fiscal Year Start:	2021/01/01	
(Automatic) Fiscal Year End:	2021/12/31	

Project Details

Project start date (format YYYY-MM-DD)	2018/09/14	
Estimated project completion date (format YYYY-MM-DD)	2023/03/31	
Project Name	Smart Grid Atlantic	
SIF Stream:	Stream 1	
SIF Project ID	811-812712	
Will this project support a new or retained R&D or production mandate?	(2) No	
Does your business or institution act as an intermediary on this project?	(2) No	
SIF defines a full-time equivalent (FTE) as 2,000 hours worked per year. On the APBR, please represent all employment figures as FTEs. If your definition of FTE varies from the SIF definition, please provide the number of hours worked per year you use to calculate an FTE here		
Hours used to calculate FTE:	2,000	
Please enter/confirm your address information below:		
Location name (the name of this establishment, facility, branch, work site, etc.)	Nova Scotia Power 1H	
Street Address	1223 Lower Water St.	
Postal Code	B3J 3S8	
City	Halifax	
Province or Territory	Nova Scotia	
Location Description (a brief phrase to describe location, e.g. Headquarters, testing facility, research centre, etc.)	Head Quarter	
Between Jan 2021 and Dec 2021,have project activities occurred at any location other than the primary address listed above?	(1) Yes	
Please fill out the project location table by clicking the link to the right to add additional details->	Project Location Table	

Multiple Business Number Clients (for-profit clients only):

If multiple affiliated companies within your enterprise are associated with the SIF project or contribution agreement (e.g. a contribution agreement commitment includes the recipient and its affiliates) the business number provided above should be the main business number associated with the SIF project. Please also provide the business numbers and details of your affiliated companies are associated with the SIF project in Complex Enterprise data sheet by clicking the link to the right.

Please provide the business numbers and details of your affiliated companies that are associated with the SIF project in Complex Enterprise data sheet by clicking the link to the right.	Complex Enterprise Data Sheet
Has your enterprise filled out an APBR for this project in a previous year?	(1) Yes
Please select the method of accounting that best represents the financial figures in this report	Accrual Accounting

Project Spending

	Valid	
Between Jan 2021 and Dec 2021, what was the total spending of your business or institution on the SIF-funded project? Include all costs associated with the project, from all sources of funds (including own-funds). Note: On project spending should include all costs incurred by the respondent, that were related to the project in this fiscal year. This includes purchases of goods and services related to the project (see Canadian Suppliers Block, below) as well as internal costs such as wages for employees.	$9,189,808.00 CAD	
If the SIF-funded project is part or component of a larger project, please indicate total expenditures by your business or institution towards this larger project in the past fiscal year. If the SIF-funded project is not part or component of a larger project, please enter 'N/A'.	$9,826,878.00 CAD	Includes EV charger projects which are not SIF funded

Canadian Suppliers Block (for-profit only)

	Invalid	
1) Between Jan 2021 and Dec 2021, what were your business's total purchases of goods and services?	$1,069,000,000.00 CAD	$817M for Fuel for power production $252 for Operating and Maintenance
a) Of the total in 1), what amount was purchased from Canadian suppliers?:		
2) Between Jan 2021 and Dec 2021, what were your business's total purchases of goods and services on the project? Provide an estimate.	$8,102,922.00 CAD	
a) Of the total in 2), what amount was purchased from Canadian suppliers?:	$7,969,871.00 CAD	

Revenues (for-profit only)

	Valid	
1) Between Jan 2021 and Dec 2021, what were your business's total gross business revenues of Canadian operations (include revenues from licensing):	$1,501,000,000.00 CAD	
a) Of the total in 1), what amount was generated from foreign markets:		
i) United States		
ii) Mexico		
iii) Europe		
iv) Other Foreign Markets		

COVID-19 Impacts

1) Between Jan 2021 and Dec 2021, were there any COVID-induced disruptions to the core business activities?	(1) Yes	
a) If yes, please explain if the disruptions resulted in challenges or opportunities for the firm (text up to 450 characters)		
Supply chain delay for materials and equipment required for core business and capital investment.		
2) Between Jan 2021 and Dec 2021, were there any direct COVID impacts on project activities?	(1) Yes	
a) If yes, please explain if the disruptions resulted in challenges or opportunities for the firm (text up to 450 characters)		
3) Between Jan 2021 and Dec 2021, did the company introduce any new products, processes, or services as a result of opportunities created by COVID-19?		
a) If yes, please describe the new product, processes, or service and opportunity created by COVID-19 (text up to 450 characters)		
Supply chain delays in equipment purchased in support of project activities.		
4) Given COVID-19 disruptions to business activities, is the company planning to increase investment in R&D over the coming years?	(2) No	
a) If yes, please describe what the increase in R&D investment activities over the coming years are likely to entail as a result of COVID-19 disruptions (text up to 450 characters)		

Continue to the Equity, Inclusion, Diversity Tab →

← Previous

Equity, Diversity, and Inclusion

Guidance and Definitions

If any response is not available, please put 'N/A' directly into the cell.

If your organization would prefer not to provide any of the responses in the below table, please use the 'Comments' column to indicate this, and provide context.

Total of the Organization's...

	Ownership		Board and Senior Management		Workforce		Notes / Comments (If data is not available, please describe why data is unavailable and if there are plans to improve data collection on EDI indicators)
	#	%	#	%	#	%	
1) Total all individuals		*100%*	18	*100%*	1237	*100%*	
Total of individuals who identify as...							
2) Women			6	33%	532	43%	
3) People with disabilities (including invisible and episodic disabilities)			n/a	N/A	54	4%	Numbers in table are based on volunteer survey results completed by
4) 2SLGBTQ+ and/or gender and sexually diverse individuals			n/a	N/A	47	4%	1,237 NS Power employees
5) Total Racialized and Indigenous Individuals			n/a	N/A	122	10%	
a) "Aboriginal" and/or Indigenous Peoples			n/a	N/A	32	3%	
b) Racialized, Black, and/or People of Colour ("Visible Minorities")			n/a	N/A	103	8%	
i) Black individuals			n/a	N/A	30	2%	
ii) Other Racialized (not including Black individuals)			n/a	N/A	73	6%	

Summary of Equity, Diversity, and Inclusion

For comparability with the 50/30 Challenge, please provide the information below for categories 3, 4, and 5. Exclude double-counting - individuals who identify across more than one of these categories should only be counted once.

What percentage of the organization is owned by persons who identify as a member of at least one of groups 3, 4, and/or 5?	n/a	
What percentage of the organization's board and senior management are persons who identify as a member of at least one of groups 3, 4, and/or 5?	n/a	

Continue to the Benefits Data Tab →

← Previous

Need Help? Refer to the Guidance and Definitions

Benefits Data

Guidance and Definitions

R&D - complete sections for business / institution - wide (left), as well as for project-specific R&D (right)

Business / Institution Wide	Valid	On Project	Valid	Notes / Comments (Please note if estimates and/or different definitions of concepts were used from the APBR definitions)
1) Between Jan 2021 and Dec 2021, what were your gross Canadian expenditures on R&D?	$250,000.00 CAD	2) Between Jan 2021 and Dec 2021, what were your expenditures on R&D for or as a direct result of the project?	$250,000.00 CAD	2021 R&D figures are preliminary estimates. 2021 SR&ED tax credit figures will be available by June of 2023. In the meantime, 2021 R&D figures have been estimated at 250,000 CAD based on preliminary information relating to 'On Project' R&D expenditures and efforts. NS Power will retroactively adjust these figures and resubmit the file with SIF following the SR&ED filing.
a) How much of this was for in-house R&D expenditures?	$250,000.00 CAD	a) How much of this was for in-house R&D expenditures?	$250,000.00 CAD	2020 R&D figures were allocated based on labour costs on the project; 2021 R&D preliminary figures are estimated to follow the same allocation as 2020 actuals.
b) How much of this was expenditures for R&D was undertaken by external		b) How much of this was expenditures for R&D was undertaken by external		
i) Parent, affiliated or subsidiaries, for R&D undertaken in Canada		i) Parent, affiliated or subsidiaries, for R&D undertaken in Canada		
ii) Other businesses, for R&D undertaken in Canada		ii) Other businesses, for R&D undertaken in Canada		
iii) Canadian universities or colleges		iii) Canadian universities or colleges		
iv) Other Canadian entity (e.g. not-for-profit, government research lab, hospitals, etc.)		iv) Other Canadian entity (e.g. not-for-profit, government research lab, hospitals, etc.)		
v) Parent, affiliated or subsidiaries, for R&D undertaken outside		v) Parent, affiliated or subsidiaries, for R&D undertaken outside		
vi) Foreign entity of any other type		vi) Foreign entity of any other type		

Guidance and Definitions — In Section 6: Special Conditions of the Contribution Agreement (CA), are there commitment(s) related to Research and Development that would NOT adequately be captured by the figures reported above? For example, this could be the result of a different definition agreed to in the CA than what the Guidance and Definitions of APBR is seeking.

Guidance and Definitions

CAPEX - complete sections for business / institution - wide (left), as well as for project-specific CAPEX (right)

Business / Institution Wide	Invalid	On Project	Invalid	
1) Between Jan 2021 and Dec 2021, what were your gross capital expenditures in Canada?:	$387,568,877.35 CAD	4) Between Jan 2021 and Dec 2021, what were your total capital expenditures in Canada related to the project:	$9,826,878.46 CAD	
a) Buildings & non-residential construction:	$31,250,728.79 CAD	a) Buildings & non-residential construction:		
b) Machinery and Equipment Investment:	$313,362,067.31 CAD	b) Machinery and Equipment Investment:		
i) Information and Communication Technology Equipment:	$13,728,787.87 CAD	i) Information and Communication Technology Equipment:		
ii) Other M&E investment:	-	ii) Other M&E investment:	$9,246,180.58 CAD	
c) Software	$20,941,108.10 CAD	c) Software	$580,697.88 CAD	
d) Other Capital Expenditures (e.g. land):	$8,286,185.28 CAD	d) Other Capital Expenditures (e.g. land):		
2) Of the amount in (1), how much consisted of capital R&D expenditures (i.e., acquisition of fixed assets repeatedly, or continuously used in the performance of R&D)?	$0.00 CAD	5) Of the amount in (4), how much consisted of capital R&D expenditures (i.e., acquisition of fixed assets repeatedly, or continuously used in the performance of R&D)?	$0.00 CAD	
3) Of total CAPEX in (1) above, how much was 'Clean Tech'	$9,826,878.46 CAD	6) Of the total CAPEX in (4) above, how much consisted of investment in 'clean tech'	$9,826,878.46 CAD	Since this is our only 'innovation' project, CAPEX 'clean tech' at the business-level is equal to the project-level
		7) Were any of the above expenses (4) related to upgrading or expanding existing facilities?		

Guidance and Definitions — In Section 6: Special Conditions of the Contribution Agreement (CA), are there commitment(s) related to CAPEX that would NOT adequately be captured by the figures reported above? For example, this could be the result of a different definition agreed to in the CA than what the Guidance and Definitions of APBR is seeking.

Guidance and Definitions

Employment/FTEs (Full-time Equivalents) - complete sections for business / institution - wide (left), as well as for project-specific employment (right)

Business / Institution Wide	Invalid	On Project	Invalid	
1) What was your total Employment (FTEs) in Canada between Jan 2021 and Dec 2021:	2,004.00	3) Between Jan 2021 and Dec 2021, how many of your FTEs were directly employed by the project?	1.00	As at 31 December 2021, inclusive of Active, FTEs. 'On Project' is inclusive all FTEs that allocated 100% of their annual working hours (i.e. 1,820 hrs) to the project.
Of the total in (1), above, how many were in the following occupations (estimate if necessary):		Of the total in (3), above, how many were in the following occupations (estimate if necessary):		Unless otherwise described, the 'National Occupational Classifications' (NOC) formed the basis for FTE allocation to the subcategories, below.
a) Management	325.00	a) Management	2.00	Includes all non-union employees who were a direct 'Supervisor' to at least one other employee; some of which are included in the estimations in (b) to (g)
b) Professional occupations in natural and applied sciences	282.00	b) Professional occupations in natural and applied sciences	5.00	In the 'National Occupational Classifications' (NOC), this group includes IT professionals and have been allocated for 2021-22. Note that, IT professionals were not counted in this group in the 2020-21 APBR but will be attributed to this subcategory in all future reports.
c) Technical occupations in natural and applied sciences	64.00	c) Technical occupations in natural and applied sciences	11.00	Includes 'Environmental' professionals, which were attributed under (b) in the 2020-21 APBR.
d) Other professional occupations	352.00	d) Other professional occupations	20.00	Includes non-union professionals based on equivalency to the example provided in 'Guidance and Definitions' for this subcategory (exclusive of FTEs allocated to other subcategories).
e) Trades (incl. construction) equipment operators and transport	680.00	e) Trades (incl. construction) equipment operators and transport	0.00	Includes all Union "Trade" groups (e.g. Power Engineer, PPT, Maintenance, PLT, Electrical Tech., Electrician, Mechanic, System Operators, Planners).
f) Occupations in manufacturing and utilities	0.00	f) Occupations in manufacturing and utilities	0.00	FTEs allocated to this subcategory in the 2020 APBR included only 'Utilityworker' roles, which have been moved to 'Other.' Nearly all operational union FTEs and management are attributable to this subcategory but were first allocated to the more specific subgroups in (a) through (e), resulting in the 0 FTE count for this subcategory in 2021.
g) Other	626.00	g) Other	3.00	Includes total FTEs in the calendar year (i.e. general/administrative, customer care, non-union trade) minus those counted in (b) through (e).
2) Of the total in (1), above, how many FTEs were "Highly Skilled"	1,023.00	4) Of the total in (3), above, how many FTEs were "Highly Skilled"	38.00	
		5) Of the FTEs reported in 3), how many FTEs were in positions that did not exist prior to the project's start date (Sep 14, 2018) (i.e., new FTEs)? Include only FTE's working in positions that did not exist with your business or institution before the SIF-funded project, and were hired to work on the SIF-funded project. These positions are new to your company relative to the start of the project, but not necessarily new in this fiscal year.	0.00	Existing employees that were working on the project, which are reflected above, but there were no additional FTEs hired for the project in 2021.
		Of the total in (5), above, how many were in the following occupations (estimate if necessary):		
		a) Management		
		b) Professional occupations in natural and applied sciences		
		c) Technical occupations in natural and applied sciences		
		d) Other professional occupations		
		e) Trades (incl. construction) equipment operators and transport		
		f) Occupations in manufacturing and utilities		
		g) Other		
		6) Of the total in (5), above, how many FTEs were "Highly Skilled"	0.00	
		7) Between Jan 2021 and Dec 2021, how many external FTE positions were employed by the project? Include FTEs that were directly employed by the project, but did not work for your business or institution, such as construction workers and contractors who worked to establish a new facility but who were not your employees. Not all SIF clients are expected to provide this data, consult the guidance and definitions for more information.	1.00	
		Of the total in (7), above, how many were in the following occupations (estimate if necessary):		
		a) Management		
		b) Professional occupations in natural and applied sciences		
		c) Technical occupations in natural and applied sciences		
		d) Other professional occupations		
		e) Trades (incl. construction) equipment operators and transport		
		f) Occupations in manufacturing and utilities	1.00	
		g) Other		
		8) Of the total in (7), above, how many FTEs were "Highly Skilled"		

Guidance and Definitions

Intellectual Property and IP Protection

1) Has your business or institution developed a new IP strategy, or significantly modified its existing IP strategy, related to the project?	(2) No	
2) Between Jan 2021 and Dec 2021, has your business or institution filed for any intellectual property protection as a result of activities undertaken on this project?	(2) No	
b) Did your business or institution develop other IP as a result of the activities undertaken on this project, for which IP protection was not sought?	(2) No	
3) Was your business or institution involved any licensing agreements related to the SIF-funded project between Jan 2021 and Dec 2021?	(2) No	

Guidance and Definitions

Innovation

	Valid	
1) Between Jan 2021 and Dec 2021,has your business or institution developed any new or significantly improved products as a result of the project?	(2) No	
2) Between Jan 2021 and Dec 2021, has your business or institution developed any new or significantly improved services as a result of the project?	(1) Yes	
a) If yes, please provide a short description of the new services developed (text up to 450 characters)		
Community Solar Garden subscription - Eligible existing customers can subscribe to solar capacity from the Community Solar Garden in Amherst, and in return are entitled to the value of that energy as it gets put back on the grid. Customers pay a fee for the capacity and are credited for the energy (in $) on their bill, as well as receive a monthly subscription report. This launched on November 29, 2021.		
3) Between Jan 2021 and Dec 2021, has your business or institution developed any new or significantly improved processes as a result of the project?	(2) No	
4) Between Jan 2021 and Dec 2021, has your business or institution generated revenues from or brought to market any new or significantly improved products or services as a result of the project? Include estimates, if available, from new production line and process improvements.	(1) Yes	
a) If Yes, please provide an estimate of total sales revenues this year from new or significantly improved products, services commercialised and/or new production line improvements as a result of the project. Include revenues generated between Jan 2021 and Dec 2021 from new or significantly improved goods, services were developed, and/or new production line imporvements as a result of this project, in any year:	$0.00 CAD	Community solar service was launched in 2021, but did not collect any revenue until 2022.
b) Of the total in (a), what amount was generated from foreign markets (provide estimate if needed):	$0.00 CAD	
i) United States	$0.00 CAD	
ii) Mexico	$0.00 CAD	
iii) Europe	$0.00 CAD	
iv) Other Foreign Markets	$0.00 CAD	
c) Please select all that apply:		
i) Revenues are from the sale / licensing of a new product or service that was developed through the SIF-funded project	(1) Yes	
ii) Revenues are attributable to a new production line, supported by SIF, but the development of the new product was not part of the SIF	(2) No	
iii) Other, please describe below:		
5) Between Jan 2021 and Dec 2021, did your business or institution realise any cost savings from new or significantly improved processes developed as a result of the project?	(2) No	

Guidance and Definitions	Training (for-profit clients only)	Valid	
	1) Between Jan 2021 and Dec 2021, how many employees of your business began on the job training?	2,024	Total number of active employees as of 31 December 2021
	a) Of 1), how many began training directly related to the project?	0	
	2) Between Jan 2021 and Dec 2021, what is the total number of hours of on the job training provided to employees?	24,288	Assumed an average of 12-hours worth of on-the-job training for all active employees
	a) Of 2), what is the total of hours of on the job training directly related to the	0	
	3) Between Jan 2021 and Dec 2021, what were the total expenses on employee on the job training? Provide a total, do not provide a per-employee amount	$0.00 CAD	
	a) Of 3) what were the total expenses on employee on the job training directly related to the project?	$0.00 CAD	

Guidance and Definitions	Co-Ops	Valid	
	1) Between Jan 2021 and Dec 2021, how many co-ops or interns began a placement at your business or institution? Please indicate the number of four month positions.	74	
	2) Were any co-ops hired to work directly on the SIF-funded project?	(2) No	

Guidance and Definitions	Collaboration (for-profit clients only)		
	1) Was your business engaged in collaborations between Jan 2021 and Dec 2021 (e.g. contracts and partnerships for research or other innovation-related activities with other companies or with universities) as part of the SIF-funded project?	(1) Yes	
	a) If 'Yes', please complete the collaborations data sheet by clicking the link to the right. Note: The collaboration data sheet should not include collaboration between partners on network and consortium projects (such as Stream 4 and Stream 5). These should instead be captured through the intermediary data sheet (part of the Multiple-Client Project APBR; not required for all projects).	Collaborations Data Sheet	

Confidentiality:

Note all information provided on the APBR exercise will be treated as confidential. Data will not be shared outside of the Government of Canada without your consent. Data will only be published at a highly-aggregated level to speak to the impact of the SIF program as a whole. If any of the information provided on the APBR exercise is particularly sensitive, please make a note of it here.

Continue to the Validation Tab →

← Previous

Validation Sheet

Need Help? Refer to the Guidance and Definitions

Please review and attest the responses provided by selecting 'Confirmed' in the Confirmation column. Once confirmed, you can submit via email by clicking "Ready to Submit" button below, or by attaching the completed workbook to the PDF form included in your launch package.

Table 1: Values Verification

Location:	Section:	Value:	Please confirm, in the next column to the right, if the following are correct:	Confirmation:
Project and Client Data	Canadian Ownership	0%	You have indicated your company is 0% Canadian owned, is this correct? Note: for publicly traded companies with no individual foreign entity controlling more than 10% of voting shares, then the company is considered to be 100% Canadian-owned. See Guidance and Definitions for more.	
Project and Client Data	Revenue Block	$1,501,000,000.00 CAD	You have indicated the company generated $1,501,000,000.00 in revenues in the past fiscal year, is this correct?	
Benefits Data	R&D - Institution wide	$250,000.00 CAD	You have indicated spending of $250,000.00 on institution-wide R&D in the past fiscal year, is this correct?	
Benefits Data	R&D - On project	$250,000.00 CAD	You have indicated spending of $250,000.00 on on-project R&D in the past fiscal year, is this correct?	
Benefits Data	CAPEX - Institution wide	$387,568,877.35 CAD	You have indicated spending of $387,568,877.35 on institution-wide capex in the past fiscal year, is this correct?	
Benefits Data	CAPEX - On project	$9,826,878.46 CAD	You have indicated spending of $9,826,878.46 on on-project capex in the past fiscal year, is this correct?	
Benefits Data	Innovation	$0.00 CAD	You have indicated the company generated $0.00 in revenues from the sales of new or significantly improved products and services in the past fiscal year, attributable to the SIF-funded project, is this correct?	
Project and Client Data	Expenditure on goods and services from Canadian suppliers in the past year	$1,069,000,000.00 CAD	You have indicated spending of $1,069,000,000.00 on purchases of goods and services from Canadian suppliers in the past fiscal year, is this correct?	
Baseline Data Table	Revenues of Canadian Operations	$0.00 CAD	You have indicated the highest revenue generated over the baseline period is $0.00, is this correct?	
Baseline Data Table	Canadian Expenditure on R&D	$0.00 CAD	You have indicated the highest yearly R&D expenditure over the baseline period is $0.00, is this correct?	
Baseline Data Table	Expenditure on goods and services from Canadian suppliers	$0.00 CAD	You have indicated the highest yearly spending on purchases of goods and services from Canadian suppliers over the baseline period is $0.00, is this correct?	

Table 2: Data Sheet Completion Validation

Data Sheet	Number of Entries	APBR 2020-21 Requirements:	Confirmation:
←Project Location Table	8	You have indicated that project activities have taken place at location(s) in addition to the project's primary address. There are currently 8 entries s in the Project Location Table. Is this correct?	
← Complex Enterprise DS	0	You have indicated that your business is not a complex enterprise (i.e., an enterprise with multiple affliates working on the project). Is this correct?	
←Collaboration Data Sheet	3	You have indicated that your business was engaged in collaboration(s) directly related to advancing the SIF-funded project and / or that should be counted against a CA commitment during your fiscal year ending Dec, 2021. There are currently 3 entrie(s) in the Collaboration Table. Is this correct?	
← Co-Ops Data Sheet	0	You have indicated that your business or institution DID NOT hire Co-Ops students to work directly on the SIF funded project during your fiscal year ending Dec, 2021 . There are currently 0 entries in the Co-Ops Table. Is this correct?	
← Licensing Data Sheet	0	You have indicated that your business was NOT involved in a licensing agreement during your fiscal year ending Dec, 2021 . There are currently 0 entries in the Licensing Table. Is this correct?	
← Patent Application Data Sheet	0	You have indicated that your business or institution did not file a patent application(s) in your fiscal year ending Dec, 2021. There are currently 0 entries in the Patent Application Table. Is this correct?	

Table 3: Data Validation

Block:	Validation:	Data rule(s):
Project Spending	Valid	If the SIF funded project is part of a larger project, on project spending must be less than total project expenditures
Canadian Suppliers Section	Invalid	1. Amount spent on project cannot exceed total company / institution-wide purchases 2. Amount spent on the project cannot exceed total project spending 3. Amount spent company / institution-wide on Canadian suppliers cannot exceed total goods and services purchased 4. Amount spent on project on Canadian suppliers cannot exceed total goods and services purchased
Revenues	Valid	Revenues from foreign markets is less than or equal to total revenues
Institution wide expenditure - R&D	Valid	1. Total R&D is sum of R&D performed in-house and performed by external parties 2. R&D performed by external parties is equal to the sum of the subcategories 3. R&D capital expenditure is less than or equal to in-house R&D
On-Project expenditure - R&D	Valid	1. Each category of on-project R&D is less than or equal to the same category for company / institution-wide R&D (in the same row) 2. On-project total R&D is the sum R&D performed in-house and performed by external parties 3. On-project R&D performed by external parties is the sum of the subcategories 4. On-project R&D capital expenditure is less than or equal to total R&D expenditures
CAPEX - Institution wide	Invalid	1. Total CAPEX is equal to the sum of its subcategories 2. Machinery and Equipment is equal to the sum of its subcategories 3. Clean-Tech CAPEX cannot exceed total CAPEX
CAPEX - On-Project	Invalid	1. Each category of on-project CAPEX is less than or equal to the same category for company / institution-wide CAPEX (in the same row) 2. Total CAPEX is equal to the sum of its subcategories 3. On-project Machinery and Equipment is equal to the sum of its subcategories 4. On-project Clean-Tech CAPEX cannot exceed total CAPEX
Employment - Institution wide	Invalid	1. Total employment is equal to the sum of its subcategories 2. "Highly skilled" cannot exceed total employment 3. Usually "Highly skilled" would not be less than the sum of employees in b) to d)
Employment - On-Project	Invalid	1. Each category of on-project Employment is less than or equal to the same category for company / institution-wide employment (in the same row) 2. On-project total employment is equal to the sum of its subcategories 3. Each row in on-project new employment is less than or equal to each row in on-project employment 4. "Highly skilled" employment cannot exceed total employment
Innovation	Valid	1. Revenues generated from foreign markets cannot exceed total revenues 2. Revenues generated from foreign markets is equal to the sum of its subcategories
Training	Valid	1. The number of employees trained directly as a result of the SIF project cannot be greater than the total number employees trained at the business or institution 2. The number of hours provided to employees for on the job training directly related to the SIF project cannot by greater than the total number of on the job training hours at the business or institution 3. The expenses for on the job training directly related to the SIF project cannot be greater than the total expenses for on the job training at the business or institution
Co-ops	Valid	The total number of Co-Ops reported in the Co-Ops Data Sheet cannot exceed the total number reported in the Benefits Data sheet
Licensing Data Sheet	Valid	1. Total revenues from licensing cannot exceed total revenues in the past fiscal year reported in Client and Project Data sheet 2. Total revenues from foreign licensing cannot exceed total revenues in the past fiscal year generated from foreign markets (reported in Client and Project Data Sheet)

Confidentiality:

Note all information provided on the APBR exercise will be treated as confidential. Data will not be shared outside of the Government of Canada without your consent. Data will only be published at a highly-aggregated level to speak to the impact of the SIF program as a whole.

Ready to Submit? Click here!

← Return to the Project and Client Data Tab

←Return to the Benefits Data Tab

Definitions and Reporting Guide

Return to Welcome Page

General Instructions

The APBR is intended to capture analytical data that can be used to report on SIF-funded projects, and benchmark these results to existing data sources (e.g. Statistics Canada surveys).

- Please provide data as per this guidelines document, which refers to Statistics Canada definitions.

Note that if data are not readily available, an estimate can be provided. For those questions where an estimated value has been provided, please note this in the comments box. Efforts should be made to keep estimates within 10% of the likely value.

Who should complete the APBR?

For projects with a single participant (sole recipient projects), the company or organization being supported by SIF is responsible for completing and submitting the APBR.

Multiple-Client Projects

For partnership, network and consortium projects, the Lead Recipient (recipient on the Contribution Agreement) is responsible for submitting a completed APBR for itself, as well as for each of the Main Partners on the project. Please consult the instructions on multiple-client projects for more information.

Do I need to answer every question?

All sections of the APBR should be completed. If a section of the APBR does not apply to your project or business / institution, then it should still be completed to reflect this. For example, if no IP was generated by the project or licensed for the project, this question should be answered 'no', rather than left blank. Similarly, if your business / institution did not do any R&D spending last year, then the questions on R&D expenditures in the past year should be marked with a 0, rather than left blank.

Data sheets may be left blank if these do not apply. For example, if your business / institution did not engage any co-ops in the past fiscal year, then the co-ops data sheet does not need to be completed. The Benefits Data Tab provides instruction on when specific data sheets need to be completed.

Note information must be provided for project-related activities (e.g. R&D spend, CAPEX, Employment, etc.) regardless of whether these relate to a firm Contribution Agreement commitment. Estimates can be provided in instances where data are not readily available, but efforts should be made to keep estimates within 10% of the likely value.

What goes in the comment boxes?

The definitions used on the APBR may not always directly reflect your own accounting practices or how commitments are accounted for in contribution agreements. In cases where there is a variance between the APBR definition and your own accounting practices or contribution agreement commitments, please provide an explanation of the difference in the comment box under each section. If there is a variance between the APBR definition and the definition used to track progress against a contribution agreement commitment in this area, please also include the figure that represents progress against the contribution agreement commitment in the comments box. For example, legal and administrative work related to patents is excluded from the APBR / Statistics Canada definition of R&D. If your contribution agreement specified that these costs could be included against your R&D commitment, please adhere to the APBR / Statistics Canada definition of R&D for completing the APBR questions on R&D. In the comments box, please include total R&D inclusive of these additional costs.

Dropdowns

A number of the data sheets include dropdown selections. When inputting your data, please be cognisant of the options can be inputted into a dropdown cell. Please also try not to copy and paste over dropdowns. Inputting an invalid option into a dropdown cell may result in a longer data cleaning process and further follow-up calls to collect the proper data.

Unit Verification

←Return to Data Validation Sheet

This section will show the total monetary value summed from each data block. Please confirm if the data block totals are correct. If they are incorrect, navigate to the data block using the links on the left side of the sheet to make your changes. Please note that previous APBR collection years collected data as 000's. Data is now collected as exact dollar figures.

Data Validation

While filling in the form, please be aware of the data validation rules that need to be kept consistent to maintain data accuracy. Once you have filled in the form, the data validation section will indicate whether your data is valid, or if a data rule has been broken. Please comply with these rules in order to provide the most consistent data possible.

Who can I speak to for help on this?

If you have any questions on how to complete the APBR, please don't hesitate to be in touch with the Strategic Innovation Fund's Policy, Measurement and Reporting group. We recognise the effort that goes into providing this data to the program, and we are here to help in any way we can.

← Return to the Project and Client Data Tab

Client name: Client's legal and operating name.

Business number: Revenue Canada business number. For for-profit clients, if the client's activities on the SIF-funded project or contribution agreement commitments occur in more than one entity with a unique CRA business number (e.g. at an affiliate which reports its own taxes to the CRA), please also complete the Complex Enterprise data sheet.

Client Type:

Sole Recipient: The respondent is directly supported by SIF, and is the only proponent on the project.
Lead Recipient: The respondent is directly supported by SIF, but there are other main partners on the project. Note for network and consortium type projects, the Lead Recipient would also generally be an intermediary (see below).
Main Partner: The Main Partners of the project are entities other than the Lead Recipient, that nonetheless play a central role in the project. Main Partners of a project would include for example institutions and private sector enterprises that are undertaking a joint project with the Lead Recipient and play a major role on the project (other than in a capacity solely as a guarantor).

Client Status:

For Profit: Client is a for-profit business.
University / College: Respondent is a post-secondary institution.
Not-for-profit Research Institute: Respondent is a not-for-profit research institute.
Other non-profit: Respondent type is a non-profit and does not meet any of the above categories, e.g. a non-profit industry association.

Percentage Canadian Ownership: This question is only required for for-profit clients. Estimate as necessary. Please see case-specific guidance below for some common ownership structures of SIF clients, and contact SIF if you have any questions or these examples do not fit your case.

For Private Companies: Indicate the percentage of the company that is ultimately owned by Canadians or by firms incorporated in Canada (e.g. as determined by voting shares).

For Private Companies Wholly Owned by a Holding Company: If the company is owned by a Canadian holding company, but that holding company is ultimately owned by an entity outside of Canada, report the share of Canadian ownership associated with the highest level of ownership (ultimate parent). For example, Company A is a Canadian private company owned by Holding Company B. Holding Company B is 40% Canadian Owned, and 60% Foreign Owned. Company A is considered to be 40% Canadian Owned.

For Public Companies Headquartered in Canada: Any individual foreign entity that controls more than 10% of the voting shares should be considered as 'foreign ownership'. If no individual foreign entity controls more than 10% of the voting shares, then the company should be considered 100% Canadian owned. For example, Company X is a publicly traded Canadian company. Foreign Company Y owns 15% of its shares, and Foreign Investor Z owns 12% of its shares. Company X is considered to be 73% Canadian owned.

For Canadian Subsidiaries of Publicly Traded Companies Headquartered Abroad: The share of the Canadian subsidiary that is owned by a foreign-incorporated, publicly traded company, should be treated as foreign-owned. For example, if Canadian Subsidiary A is a wholly owned subsidiary of Foreign-HQ Public Company B, then Subsidiary A is considered to be 0% Canadian owned.

← Return to the Project and Client Data Tab

Fiscal Year: this question will align the APBR's data collection time period to the client's fiscal year. By selecting which month the client's fiscal year ends in, the APBR will automatically adhere to the most recent fiscal year available prior to this year's collection. If there are issues aligning these dates to the client's available data, please contact SIF.

← Return to the Project and Client Data Tab

SIF Stream: Select appropriate SIF Stream

SIF Project ID: This is the unique identifier associated with the SIF contribution agreement to support the project.

Project is for new / Retained R&D or Production Mandate: Identify whether this project supports a new or retained R&D or production mandate for the client.

Intermediary: Intermediaries are entities (often non-profits) that received SIF support specifically to provide services and/or funding (e.g. R&D collaboration, incubator / accelerator services, flow-through funding, etc.) to support innovation activities in other entities (generally for-profit firms, start-ups, etc.) The lead recipient on network / consortium projects would generally be an intermediary on the SIF project. A project-level APBR, including an intermediary data sheet should be provided for SIF projects that include intermediaries. Note that intermediary-type support is different from, for example, a SIF client undertaking a specific research collaboration with a university to advance its project, or a SIF client contracting research activities to an outside party. These should be captured in the collaborations data sheet associated with each client's APBR.

← Return to the Project and Client Data Tab

Client Primary Address: This is the primary address of the client's Canadian operations.
Location Description: A brief phrase or note to describe the location (e.g. headquarters, facility construction location, testing centre, etc.)

← Return to the Project and Client Data Tab

Return to Project and Client Data Section

Project Location Table: If the client's activities on the project take place at a location other than the client's primary address, this information should be provided here. Please list all locations where project activities have taken place in the fiscal year as specified. For example, if the client's primary address is its HQ in Toronto, but the SIF-supported project is research that takes place at a lab in Edmonton, the Edmonton location should be provided here. Note: this address should reflect the location of client's activities on the project in the past fiscal year, and not the address of a partner that is also undertaking its own work activities on the project. In cases where the SIF project is e.g. a joint research project, the client should not include the partners' address here, unless this address is the physical locations where the client performed its activities on the project. With the increased prevalence of work from home due to the COVID-19 pandemic, employees are increasingly not located at traditional offices. Given individual's home locations is sensitive data, please refrain from including an individual's address in the Project Location Table. Instead include where the employee would have worked from had they worked in the office.

← Return to the Project and Client Data Tab

←Return to Complex Enterprise Data Sheet

Complex Enterprise Data Sheet:
If the SIF-funded project implicates other affiliates (either through activities on the project, or through meeting Contribution Agreement benefits commitments), then the Complex Enterprise data sheet should be filled out and the company / institution wide information on the APBR benefits section, the baseline data section, and the project and client data section, should be provided for the recipient and any of its implicated affiliates, in aggregate (the 'reporting unit').

The CRA business numbers and details of your affiliated companies that are associated with the SIF-funded project should be provided in the Complex Enterprise data sheet. This group of affiliated companies that are participants on the SIF-funded project should be considered the 'reporting unit', and all data on the APBR should reflect these affiliated companies in aggregate. If all of your Canadian affiliates are associated with the project, please enter the word 'enterprise' in the top row, once in each field; no other information is needed on the table.

← Return to the Project and Client Data Tab

←Return to Baseline Data Sheet

R&D Definition and Guide

Baseline data: For for-profit clients only. These data should reflect relevant information on the client for the three years prior to the beginning of the SIF-funded project. Note that data should reflect the Canadian operations of your company, in the case of multinationals.
Fiscal Year: The fiscal years for the baseline data table are generated automatically based on the project start date and the fiscal year reporting period you provided in the Project and Client Data tab.
Gross Business Revenues of Canadian Operations: Provide the operating revenues generated by your company's Canadian operations by each fiscal year.

Gross Canadian Expenditures on R&D: Provide the R&D expenditures by your company's Canadian operations each fiscal year. Please consult the definition of R&D in the annex to this document.

Employment: Provide the number of FTEs employed in your company's Canadian operations by fiscal year.
Goods and Services Sourced from Canadian Suppliers: Dollar value of purchases from Canadian suppliers by fiscal year. Provide an estimate if needed. The figure should include all purchases, by your company's Canadian operations, of goods and services provided by Canadian suppliers (companies).

← Return to the Project and Client Data Tab

Canadian Suppliers: Provide an estimate of the amount of goods and services purchased from all suppliers (domestic and international) in the past fiscal year. This should include purchases of contracting services, materials, M&E, capital and tooling purchases etc. and should not include items such as employee wages. Then please also provide the estimate of the amount of goods and services were purchased only from Canadian suppliers.

← Return to the Project and Client Data Tab

Total Gross Business Revenues of Canadian Operations: Provide the revenues generated by the company's Canadian operations in the past fiscal year. Note that this figure should include revenues generated in foreign market, by Canadian operations (e.g. exports by Canadian operations). Total gross business revenues should exclude funding from external sources such as the SIF contribution to the project.

Revenues Generated in Foreign Markets: Provide operating revenues generated by Canadian operations, from foreign markets. Include for example exports of goods, and revenues generated for services provided in foreign markets and accruing to Canadian operations. Note Gross Business Revenues of Canadian Operations (above) should include the Revenues Generated in Foreign Markets.

←Return to Equity, Inclusion, Diversity

The Government of Canada is committed to tackling challenges encountered by under-represented and disadvantaged groups in Canadian research institutions and addressing the impacts on research at large.

The equity-deserving groups outlined in this section reflect the designated groups outlined in the Employment Equity Act, with the addition of 2SLGBTQ+ and/or gender and sexually diverse individuals. The information presented in this section aligns with the definitions found in the Publicly Available Specification (PAS): The 50 – 30 Challenge, linked below.

We encourage your disclosure of this information to support an environment where different perspectives and novel ideas are supported and welcomed, which is particularly important for innovation. The Strategic Innovation Fund collects this data to gauge if Canadian businesses and industries are growing in an inclusive and sustainable manner that benefits all Canadians.

Note: if data are not available for indicators or not applicable (e.g. ownership for publicly traded companies), please enter the exact text 'N/A' in your response.

The 50 – 30 Challenge: Your Diversity Advantage

←Return to the Benefits Data Tab

R&D Definition and Guide

Gross expenditures on R&D: Please provide the gross expenditures undertaken by your company's Canadian operations on R&D in the past year. Note, this should include R&D contracts where your company's Canadian operations are funding other entities to undertake R&D on its behalf, even if these other entities are not located in Canada.

Additional guidance regarding the definition of R&D is provided in the annex to this document. Note as per the instructions above, in cases where there is a variance between the APBR definition and the respondent's own accounting practices or commitments in respect of a contribution agreement, the respondent is asked to provide an explanation of the difference in the comment box.

Cost of R&D Performed in-house by your company: This category should include gross expenditures on R&D (from above) that were undertaken by the company. For example, the salaries of scientists and technicians that are employed by the company to do R&D would be included here.

Cost of R&D performed by external parties: This category should include payments made to other companies, organizations or individuals to fund R&D performance, i.e. where your company paid an external party to perform R&D on its behalf. Include grants, fellowships, and contracts. Note: If these kinds of activities were undertaken as part of the SIF-funded project, then they should also be captured under the 'collaboration' part of the questionnaire.

Note: If you are a 'complex enterprise', then the APBR is being filled out for multiple affiliated companies (the 'reporting unit' as per the Project and Client Data question on Complex Enterprises). In this case, the question on R&D performed by affiliated companies should only reflect R&D funded by these companies within the reporting unit, but performed by other affiliates not otherwise associated with the SIF project. Please contact SIF for further guidance on this question.

R&D capital expenditures: Capital in-house R&D expenditures are the annual gross amount paid for the acquisition of fixed assets that are used repeatedly, or continuously in the performance of R&D for more than one year. Do not amortize capital expenditures to calculate this figure; present them as expenses in the year in which they occurred.

←Return to the Benefits Data Tab

Capital Expenditures: Include your company's (Canadian operations) gross expenditures on fixed assets for use in the operations of your organization or for lease or rent to others. Note that this should include any capital in-house R&D expenditures. Include all costs related to the acquisition and installation of equipment or construction (including own-employee labour / installation costs etc.) Do not amortize capital expenditures to calculate this figure; present them as expenses in the year in which they occurred. Note that capital expenditures should include all expenditures on capital for use by your company's Canadian operations, including for imported assets (e.g. Machinery and Equipment).
Buildings and non-residential construction: Capital expenditures incurred during the reporting period for non-residential building and engineering construction (on a contracted basis and/or by your own employees) whether for your own use or rent to others (e.g. manufacturing plants, office buildings, processing facilities, etc.)
Machinery and Equipment: Capital expenditures incurred during the reporting period for machinery and equipment, whether for your own use or for lease or rent to others (e.g. vehicles; scientific equipment; processing machinery; computers, software, telecommunications and other information and communications technology, etc.)
For more information, please refer to the following link for detailed methodology: https://www.statcan.gc.ca/en/statistical-programs/document/2803_D15_V8
Information and Communication Technology: Investment in ICT equipment should be included in the M&E total, as well as reported separately here. ICT includes computers, communications equipment, networking equipment, etc.
Other M&E: Include all other machinery and equipment investment.
Software: Capital expenditures for software should include all costs associated with the purchase of software (Pre-packaged software, Custom software developed in-house/own account, Custom software design and development, contracted out).
Clean Tech: Clean technology is defined as any process, product, or service that reduces environmental impacts through environmental protection activities, through the sustainable use of natural resources, or through the use of goods that have been specifically modified or adapted to be significantly less energy - or resource-intensive than the industry standard.
To determine if a technology is classified in the clean technology taxonomy, click here.

←Return to the Benefits Data Tab

Employee and Full Time Equivalents (FTEs): Any person drawing pay for services rendered or for absences, and for whom the employer must complete a Canada Revenue Agency T4 form, is deemed to be an employee. The 'employee' concept used here comprises full-time employees, part-time employees (those who regularly work fewer hours than the standard work week of the establishment) and casual or temporary employees. It also comprises working owners, directors, partners, and other officers of incorporated businesses.

The 'employee' concept excludes owners or partners of unincorporated businesses and professional practices, the self-employed, unpaid family workers, persons working outside Canada, military personnel, and casual workers for whom a T4 form is not required. It also excludes persons who did not receive any pay from the employer for the entire survey reference period (e.g., persons on strike, on unpaid holidays, or receiving remuneration from an insurance plan, workers compensation or related fund). However, employees paid by the employer for a part of the reference period, but who are unemployed or on strike for the rest of that period, are counted as employees.

Unless otherwise specified, employment figures should be reported by using the following definition of a Full Time Equivalent (FTE): each 'employee', as defined above, who works for the client on a full-time basis (i.e. they are scheduled to work at least 2,000 hours for the Recipient when calculated on an annual basis) and, in the case of hourly paid employees who are responsible to work for the client less than on a full-time basis, each equivalent to such a full-time worker, where the number of such equivalents is calculated by dividing (a) by (b) where (a) = the aggregate of all hours worked by such individuals for the client including hours taken by them as paid vacation, sick leave, and for other similar reasons, calculated on an annual basis, and (b) = 2,000 hour". Please include all paid employees in reporting and exclude employees on unpaid leave of absence.
Enterprise / Institution Wide: Provide total employment, in FTEs, at your business or institution in the past fiscal year. Provide breakdown by occupation; estimate breakdown by occupation if necessary.
On Project (total): This figure should be provided for FTE positions with your business or institution, that were employed directly on or by the project, at any phase during the project. For example, if a project is underway to set up a new production line, include FTEs that were employed in the past year to set up the new production line; after the production line is established, include FTEs that were employed on the production line in the past year. Note that on-project FTEs would be a part of total top-line employment.
On Project (New FTEs): This figure should be provided for positions that did not exist with your business or institution before the SIF-funded project, that were directly employed on the project in the last year (e.g. positions that were created with your company to work on the SIF-funded project). Employee turnover should not be counted here - for example, if an engineer who already worked with a company was assigned to work on the project, then left the company and was replaced by a new engineer in the same role, this would not be considered a 'New FTE'. Note that on-project (new FTEs) are a component of on-project (total) FTEs.

External FTEs: External FTEs includes FTEs that were directly employed by your business or institution for the project, but that did not work for the your business or institution. This would include for example sub-contracted construction workers and contractors who worked to establish a new facility but who were not your employees. This figure should not include FTEs that were employed by a partner/collaborator on the project. Note that this question is included on the APBR primarily to gather benefits data for large construction projects, where SIF clients have indicated substantial external jobs benefits or made contribution agreement commitments in respect of external jobs. Not all SIF clients are expected to provide this information.

Management: Include here middle and senior management who plan, organize, direct, control and evaluate the daily activities and future developments within the firm.
Professional occupations in natural and applied sciences: Include here scientists, engineers, etc.
Technical occupations in natural and applied sciences: Include lab technicians and support staff, etc.
Other professional occupations: Include lawyers, accountants, etc.
Trades (incl. construction) equipment operators and transport: Include construction jobs, transport and heavy equipment operation, vehicle drivers, etc.
Occupations in manufacturing and utilities: Include positions such as assemblers, processing machine operators, manufacturing or utilities labourers, etc.
Other: Include positions not fitting one of the above categories.
For more information about the occupational breakdowns, please follow the link to a tool that can support identifying the correct occupational category.
https://noc.esdc.gc.ca/?GoCTemplateCulture=en-CA
Highly Skilled-means an employee that requires specialized training. This may include scientists, engineers, managers and specialized trades and would typically include the employees designated as working in professional or technical occupations in natural and applied sciences or other professional occupations.

Return to Benefits Data Section - R&D

Return to Benefits Data Section - CAPEX

Return to Benefits Data Section - CAPEX

Contribution Agreement (CA) and APBR Reporting Variances

In cases where the agreed upon definition in the CA varies sufficiently that you feel that reporting based on the APBR definitions would not adequately capture activities on the SIF funded project, please select 'Yes' from the dropdown menu and follow the link by clicking 'Commitment' in the adjacent cell. Note: not all fields are required in this section. Please just provide responses for items with a CA Benefit Commitment.

←Return to the Benefits Data Tab

Intellectual Property and IP Protection
This section collects information about IP related to the project. The client should not report IP activities here that were not directly related to the project. This section should be completed for for-profit clients, as well as for not-for-profit clients, universities, colleges, etc.

Intellectual Property - means all inventions, whether or not patented or patentable, all commercial and technical information, whether or not constituting trade secrets, and all copyrightable works, industrial designs, integrated circuit topographies, and distinguishing marks or guises, whether or not registered or registrable.

Licensing agreements: The licensing data sheet should be completed if the client has entered into any licensing arrangements related to the SIF-funded project (licensing out IP developed under the project; licensing in needed IP for use on the project or to combine with the project IP). For the purposes of this survey, End User License Agreements (EULAs) will not be counted in license agreements.

←Return to Patent Applications Data Sheet

Patent Application Data Sheet

This data sheet collects relevant information for any patents filed as a result of the SIF-funded project. Please include patent applications that were filed or patents that came into effect in the past fiscal year. Note: only patent applications directly related to the SIF-funded project (i.e. applications filed for inventions developed as part of the project) should be included here.

Project IP - If this patent consists of "project IP" as defined in your Contribution Agreement, please indicate so here.

Licensing Data Sheet:

←Return to Licensing Data Sheet

Note: Only licensing arrangements that are a core component of the SIF project need to be included here. These would include, for example, out-licensing of IP developed through the SIF project and attributable to the SIF funding; or in-licensing of IP required for the SIF project to take place. For the purposes of this survey, standard End User Licensing Agreements (EULAs) such as those often used for the sale of software to clients should not be represented in this table. If any licensing agreements were reported in previous APBRs, were also active in this past fiscal year, please ensure that the unique ID for these agreements is consistent on this year's APBR. Also please ensure that revenues from out-licensing agreements are reflected in the appropriate revenues categories on the Benefits data tab and the Project and Client data tab.

· Unique Identifier: Provide a unique ID for the licensing agreement. This should be a number or name that is specific to this agreement, that remains the same from year to year for multi-year agreements. It could be, for example, a contract number from your financial system, or a number assigned to represent the agreement for this exercise.

· Partner name, address information: Provide the operating name and address information for the partner (licensor or licensee) with which your company signed the licensing agreement.

· Partner Relationship to Client: Select the organizational relationship of the partner to the client. If no such relationship exists, select "No organizational relationship".
· Direction of Licensing: Select "In-license" if your company is licensing IP from the partner (i.e. your company is the licensee); select "Out-license" if your company is licensing IP to the partner (i.e. your company is the licensor). Select "In-license and out-license (cross-license)" if your company and the partner have licensed IP to each other.
· Main Purpose for Licensing: Select whether the license is an in-license (to obtain rights to Background IP or to combine with Project IP), a non-exclusive out-license, or an exclusive (all-purpose) out-license.
· Execution Date: Provide the date (YYYY/MM/DD) on which the licensing agreement took effect
· End Date of Licensing Agreement: Provide the end date (if known) of the licensing agreement

· Payment / Receipts: Provide a dollar figure (in CAD) for all payments or receipts related to the licensing agreement over the past fiscal year.

←Return to the Benefits Data Tab

Innovation
This section collects information about innovation related to the project. The client should not report innovation activities here that were not directly related to the project. This section should be completed for for-profit clients, as well as for not-for-profit clients, universities, colleges, etc.

Product or service innovation is the market introduction of a new or significantly improved product or service with respect to its capabilities, user friendliness, components or sub-systems.

A process innovation is the implementation of a new or significantly improved production process, distribution method, or support activity for your goods or services.
Revenues and cost savings generated by new products, services, processes: Please report, for the past fiscal year, revenues (or % cost savings) attributable to any innovations developed (or implemented) as part of the SIF-funded project. Report on these revenues even if the innovation was developed (or implemented) in previous years. For example, if your company introduced a new product two years ago, and made $2,000,000 from sales of this new product this year, report on the $2,000,000 in sales this year. Also note that revenues should also be reported for products that are being licensed out.

For cost savings from process innovation, provide an estimate of the percentage of costs your business saved as a result of the introduction of the process innovation. For example, if costs would have been 10% higher without the introduction of the innovation, write 10 here.
Note: all definitions drawn from Statistics Canada Survey of Innovation and business Strategy Reporting Guide. Click Here to read more.

←Return to the Benefits Data Tab

Training
This section collects information about training activities undertaken at the client. On-the job training includes structured learning activities which include workshops, private lessons, and other online learning initiatives. Total training activities should be reported, as well as training directly related to the project (e.g. training on new equipment acquired as part of the project or training activities that were specifically intended to help employees advance the project).

←Return to the Benefits Data Tab

Co-Ops

Provide information on the number of co-ops, interns, and other student work placements that began with your company in the past Fiscal Year. Please count four-month terms, i.e. count a single 8-month term as two four-month terms. In addition to providing this information for all co-ops engaged by the client in the past Fiscal Year, please also complete the co-op data sheet for any co-ops that were engaged to work directly on the SIF-funded project. Note: for the co-ops data sheet, specify the start and end date of each individual co-op placement.

←Return to Co-Ops Data Sheet

Co-Ops Data Sheet: (only required for co-ops worked directly on the SIF-funded project)
Institution (college or university name): The name of the college or university from which the co-op is being brought on to work on the project.
Level: Indicate whether the placement is for a college, bachelor, or post-graduate level co-op student
Term start and end dates: Provide the start and end date of the individual co-op placement.
Field of Study: Provide the best fit for the field of study of the student from available options.
Postal Code: Provide the postal code of the institution's primary address.

←Return to the Benefits Data Tab

←Return to Collaboration Data Sheet

Collaboration (For-profit only)
The collaboration data sheet is intended to capture collaborations undertaken by the client in the past fiscal year, other than intermediary-type support. The collaboration data sheet should not include collaboration between partners on intermediary, network and consortium projects (such as Stream 4 and Stream 5). These should instead be captured through the intermediary data sheet. Please consult the instructions on intermediary, partnership, network and consortium projects, below.
Collaborations are (generally formal) agreements with a partner to further R&D, innovation, or other project activities, and should include e.g. outsourced R&D (contracts) as well as collaborations to which the client makes an in-kind contribution. Collaborations can be mutually beneficial to both parties. Note that the collaboration data sheet is not intended to capture simple contracts for the provision of goods and services. Include here any collaboration that was undertaken to advance the SIF-funded project, as well as any collaboration that was not directly related to the SIF-funded project, but where the collaboration should be counted against the client's contribution agreement commitments.
Collaboration Data Sheet:
· Unique Identifier: Provide a unique ID for the collaboration agreement. This should be a number or name that is specific to this agreement, that remains the same from year to year for multi-year agreements. It could be, for example, a contract number from your financial system, or a number assigned to represent the agreement for this exercise.
· Collaboration partner name and address information: The operating name and address information of the academic institution, research institute, for-profit company with which the client has a collaborative agreement.

· Collaboration Type: Specify if the collaboration was for R&D, other innovation-related activities not meeting the definition of R&D provided in the annex, or other collaboration type.

· Collaboration Start Date: Provide the start date of the collaboration agreement with the partner. Note: collaborations may have a start date prior to the beginning of the SIF-funded project, e.g. where there is a contribution agreement commitment to maintain a collaboration.
· Company Contribution to Collaboration in Past FY: Provide the value of the company's contribution to the collaboration in the past year. This could include, for example, payments for a research contract, and / or estimated pro-rated salaries of company employees who made in-kind contributions to the collaboration.
· Collaboration directly related to SIF-funded project: Indicate whether the collaboration was entered into specifically to advance or augment the SIF-funded project.

Return to General Guidance

Multiple Client Projects

Intermediary projects: a recipient is funded by SIF to provide services and / or flow-through funding to support projects with clients. The projects do not need to be specified at the outset.

Partnership: a recipient is funded by SIF, to undertake a specified project, in collaboration with one or more main partners.

Network and consortium projects: Include partnership and intermediary project elements; a lead recipient generally acts as an intermediary on these projects, but a substantial amount of the activity funded by SIF will include a group of core partners (main partners). The lead recipient will often be an intermediary, and provide flow-through funding and / or services to support collaborations with and between main partners, and between additional partners.
The lead recipient on multiple client projects is required to submit a completed Multiple Client Project APBR.
For partnership and network / consortium projects, the lead recipient is also responsible for providing a completed client-level APBR for all main partners on the project.
For projects where the recipient is also an intermediary, an intermediary data sheet should also be submitted to report information on the various projects and collaborations that were funded or supported by the intermediary in the past fiscal year.
A partner information sheet should be completed for all additional partners (i.e. partners other than main partners, including ultimate recipients of intermediary support) who received any flow-through funding support from SIF. This sheet should be provided every year the additional partner is active on the project.

A project data information sheet should also be submitted by each intermediary. The project data information sheet captures qualitative information about each project supported by the intermediary. The project data information sheet should include only projects that began in the reporting year in question, i.e. individual projects should only be reported in here once.

Return to Benefits Data Section

Return to Benefits Data Section

Definition and Inclusions / Exclusions for R&D:
Note: all definitions drawn from Statistics Canada RDCI Reporting Guide: https://www.statcan.gc.ca/en/statistical-programs/document/4201_D7_V7
Definition:
Research and Development Definition: Creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. The same definition of research and development used by the Statistics Canada Survey of Research and Development in Canadian Industry should be used here. Some examples of borderline inclusions / exclusions are provided below:

Inclusions:
Prototypes: Include design, construction and operation of prototypes, provided that the primary objective is to make further improvements or to undertake technical testing. Exclude if the prototype is for commercial purposes.

Pilot plants: Include construction and operation of pilot plants, provided that the primary objective is to make further improvements or to undertake technical testing. Exclude if the pilot plant is intended to be operated for commercial purposes.

New computer software or significant improvements/modifications to existing computer software: Include technological or scientific advances in theoretical computer sciences; operating systems e.g., improvement in interface management, developing new operating system or converting an existing operating system to a significantly different hardware environment, programming languages, and applications if a significant technological change occurs.

Contracts: Include all contracts which require R&D. For contracts which include other work, report only the R&D costs.

Research work in the social sciences: Include if projects are employing new or significantly different modelling techniques or developing new formulae, analyzing data not previously available or applying new research techniques, development of community strategies for disease prevention, or health education.

Exclusions:

Routine analysis in the social sciences including policy-related studies, management studies and efficiency studies: Exclude analytical projects of a routine nature, with established methodologies, principles and models of the related social sciences to bear on a particular problem (e.g., commentary on the probable economic effects of a change in the tax structure, using existing economic data; use of standard techniques in applied psychology to select and classify industrial and military personnel, students, etc., and to test children with reading or other disabilities).

Consumer surveys, advertising, market research: Exclude projects of a routine nature, with established methodologies intended for commercialization of the results of R&D.

Routine quality control and testing: Exclude projects of a routine nature, with established methodologies not intended to create new knowledge, even if carried out by personnel normally engaged in R&D.

Pre-production activities such as demonstration of commercial viability, tooling up, trial production, and trouble shooting: Although R&D may be required as a result of these steps, these activities are excluded.

Prospecting, exploratory drilling, development of mines, oil or gas wells: Include only if for R&D projects concerned with new equipment or techniques in these activities, such as in-situ and tertiary recovery research.
Engineering: Exclude engineering unless it is in direct support of R&D.
Design and drawing: Exclude design and drawing unless it is in direct support of R&D.
Patent and license work: Exclude all administrative and legal work connected with patents and licenses.
Cosmetic modifications or style changes to existing products: Exclude if no significant technical improvement or modification to the existing products has occurred.
General purpose or routine data collection: Exclude projects of a routine nature, with established methodologies intended for on-going monitoring of an activity.
Routine computer programming, systems maintenance or software application: Exclude projects of a routine nature, with established methodologies intended to support on-going operations.
Routine mathematical or statistical analysis or operations analysis: Exclude projects of a routine nature, with established methodologies intended for on-going monitoring of an activity.
Activities associated with standards compliance: Exclude projects of a routine nature, with established methodologies intended to support standards compliance.
Specialized routine medical care such as routine pathology services: Exclude projects of a routine nature, with established methodologies intended for on-going monitoring of an activity.

← Return to the Project and Client Data Tab

Baseline Data Table

Need Help? Refer to the Guidance and Definitions

You have identified that this is not your organization's first time completing the APBR for project id: '811-812712'. If it is the organization's first time completing the APBR excersise, please return to the 'Project and Client Data tab' and revise Cell E46.

Please provide the below information as per the guidance in the 'Guidance and Definition' tab for your business in the three years prior to the start of the SIF funded project. Each indicator should align with the current fiscal year data provided on the 'Project and Clients' and 'Benefits Data' tabs.

Fiscal Year Start (Automatic)	Fiscal Year End (Automatic)	What were your gross Business Revenues of Canadian Operations	What were your gross Canadian expenditures on R&D	What were your gross capital expenditures in Canada	What was your total Employment (FTEs) in Canada	What were your business's total purchases of goods and services from Canadian suppliers?	Notes / Comments (Please note if estimates and/or different definitions of concepts were used from the APBR definitions)
Sunday, January 1, 2017	*Sunday, December 31, 2017*						
Friday, January 1, 2016	*Saturday, December 31, 2016*						
Thursday, January 1, 2015	*Thursday, December 31, 2015*						

Note: the baseline data years are automatically calculated by the APBR form based on the project start date and fiscal year entered in the Project and Client Data Tab, and are intended to provide an analytical benchmark for the client's status prior to the SIF project. If you have any concerns about how these years have been selected, please contact SIF.

← Return to the Project and Client Data Tab

Project Location Table

Need Help? Refer to the Guidance and Definitions

In the table below, please list all of the location(s) where the project activities have/will be undertaken:
(most projects will only have one location/establishment)

Location name (the name of this establishment, facility, branch, work site, etc.)	Location description	Street Address	Postal Code	City	Province or Territory
Nova Scotia Power 1H Head Office	NSP corporate head office	1223 Lower Water St.	B3J 3S8	Halifax	Nova Scotia
Nova Scotia Power Control Centre	System control centre	5 Long Lake Drive	B3S 1N8	Halifax	Nova Scotia
Nova Scotia Power Lakeside Depot	Operational & Fleet Depot	25 Lakeside Park Drive	B3T 1M9	Halifax	Nova Scotia
Amherst Community Solar Garden Site	Amherst Industrial Park	Tupper Blvd	B4H 4S7	Amherst	Nova Scotia
Multiple Customer Homes across Nova Scotia	100 customer homes	Multiple			Nova Scotia
Maritime Pride Eggs	Industrial customer	50 Tantramar Crescent	B4H 0A1	Amherst	(8) Nova Scotia
Compass Minerals	Industrial customer	327 Smith Rd	B4H 3Y4	Amherst	(8) Nova Scotia
Bedford Institute of Oceanography	Industrial customer	1 Challenger Dr	B2Y 4A2	Dartmouth	(8) Nova Scotia

← Return to the Project and Client Data Tab

Complex Enterprise Data Sheet

Need Help? Refer to the Guidance and Definitions

This group of affiliated companies that are participants on the SIF-funded project should be considered the 'reporting unit', and all data on the APBR (unless otherwise specified) should reflect these affiliated companies in aggregate. Note also that in the case of multinational enterprises, data on the APBR should only be provided for these enterprises' Canadian operations.

Business Number (i.e., Canada Revenue Agency Number)	Business or Institution's legal name	Business or Institution's operating name	Street Address	Postal Code	City	Province or Territory

←Return to the Benefits Data Tab

Collaboration Data Sheet

Need Help? Refer to the Guidance and Definitions

Please list all collaborations active during the fiscal year ending Dec 31, 2021. Do not include normal contracts for the supply of goods and services. Note: If any licensing agreements were reported in previous APBRs, were also active in this past fiscal year, please ensure that the unique ID for these agreements is consistent on this year's APBR

Unique Identifier (e.g. could be a Collaboration Contract / agreement Number)	Collaboration partner name (provide institution / enterprise name, not individual)	Partner Status	Partner Country	Partner City	Partner Street Address	Partner Postal Code	Collaboration Type (Research, Other Innovation, Other)	Collaboration start date (YYYY-MM-DD)	Enterprise contribution to collaboration in the past FY (can provide estimated dollar value for in-kind contributions)	Collaboration directly related to SIF-funded project activity
NSPOWER1	Nova Scotia Community College	(3) University or college	Canada	Halifax, Middleton	295 Commercial St, Middleton	B0S 1P0	(1) Research		$10,000.00 CAD	(1) Yes
NSPOWER2	Dalhousie University	(3) University or college	Canada	Halifax	5273 DaCosta Row	B3J 0H6	(1) Research		$0.00 CAD	(1) Yes
NSPOWER3	Town of Amherst	(4) Other non-profit	Canada	Amherst	98 Victoria Street East	B4H 1X6	(3) Other		$3,000.00 CAD	(1) Yes

←Return to the Benefits Data Tab

Co-Ops Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that no Co-Ops were hired to work directly on the SIF funded project in the fiscal year ending Dec 31, 2021. As a result, the Co-Ops Data Sheet is not required to be completed for this year's APBR exercise. If there were Co-Ops hired to work directly on the SIF funded project in the fiscal year ending Dec 31, 2021, please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E137 before continuing.

A separate row should be filled for each co-op term hired in the past fiscal year to work directly on the project.

Institution (college or university name)	Institution's Primary Postal Code	Level (college, bachelor, graduate, post-graduate)	Co-Op Term Start Date (YYYY/MM/DD)	Co-Op Term End Date (YYYY/MM/DD)	Field of Study

←Return to the Benefits Data Tab

Licensing Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that there were no active licensing agreement(s) related to the SIF funded project over the fiscal year ending Dec 31, 2021. As a result, the Licensing Data Sheet is not required to be completed for this year's APBR exercise. If there were active licensing licensing agreements related to the SIF funded project, please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E96

Note: Only licensing arrangements that are a core component of the SIF project need to be included here. These would include, for example, out-licensing of IP developed through the SIF project and attributable to the SIF funding; or in-licensing of IP required for the SIF project to take place. For the purposes of this survey, standard End User Licensing Agreements (EULAs) such as those often used for the sale of software to clients should not be represented in this table. If any licensing agreements were reported in previous APBRs, were also active in this past fiscal year, please ensure that the unique ID for these agreements is consistent on this year's APBR. Also please ensure that revenues from out-licensing agreements are reflected in the appropriate revenues categories on the Benefits data tab and the Project and Client data tab.

Unique identifier (e.g. could be a Contract ID) (provided by client)	Partner Name	Partner Country	Partner City	Partner Street Address	Partner ZIP/Postal Code	Partner Relationship to Client	Direction of Licensing (In = licensing IP FROM partner; Out = licencing IP TO partner)	Main Purpose for Licensing	Execution Date of Licensing Agreement (YYYY)	End date of Licensing Agreement (YYYY)	Value of payments made for licensing rights between Jan 2021 and Dec 2021	Value of receipts from licensing agreements between Jan 2021 and Dec 2021

← Return to the Benefits Data Tab

Patent Application Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that there were no IP or patent applications filed in the fiscal year ending Dec 31, 2021 that were releated to the SIF funded project. As a result, the Patent Application Data Sheet is not required to be completed for this year's APBR exercise. If there were patent applications filed releated to the SIF funded project in the fiscal year ending Dec 31, 2021 , please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E84 and E86

Please list any patent applications that exist as a result of IP developed through SIF funding. Only IP relevant to the project.

Name of Patent Owner (Assignee)	Patent Owner Relationship	Patent application number (include prefixes e.g. US, CA, PCT, etc.)	Is this a Patent Cooperation Treaty filing?	Application office or country	Filing date (YYYY-MM-DD)	Earliest Priority number (include prefixes e.g. US, CA, etc.)	Earliest Priority date (YYYY-MM-DD)	Publication number (if available) (include prefixes e.g. US, CA, WO, etc.)	Title	Technology Category	Abstract or Summary of Invention (maximum 750 characters or provide hyperlink)	Status of IP	Does this patent constitute Project IP?

NATURAL RESOURCES CANADA

SGNS Annual Performance Report

1 – PROJECT INFORMATION

Case File Number	GISG-3085
Program	Green Infrastructure – Smart Grids
Proponent	Nova Scotia Power Inc.
Project Title	Collaborative Grid Innovation for Atlantic Smart Energy Communities
Reporting Fiscal Year	2021/22
Project Completion Date (per CA)	31 Jul 2023
Submission Date	Wed, 27 Jul 2022

PROJECT TEAM MEMBERS

Name	Sanjeev Pushkarna
Organization	Nova Scotia Power
Role on this project	Project Lead
Experience	Multiple years in NS Power Customer Solutions leading products and projects.
Email	sanjeev.pushkarna@nspower.ca
Phone	(902) 478-3307

Name	Sean Brennan
Organization	Nova Scotia Power
Role on this project	Funding and Reporting
Experience	Multiple years in Nova Scotia Power leading projects and operations.
Email	sean.brennan@nspower.ca
Phone	(902) 220-1114

Name	Ash Abdelrahman
Organization	Nova Scotia Power
Role on this project	Technical Advice
Experience	Multiple years at NS Power in transmission and distribution operations.
Email	ashraf.abdelrahman@nspower.ca
Phone	(902) 225-9865

NATURAL RESOURCES CANADA

SGNS Annual Performance Report

Name	Rob Boone
Organization	Nova Scotia Power
Role on this project	Technical Advice
Experience	Multiple years in transmission and distribution engineering.
Email	robert.boone@nspower.ca
Phone	(902) 574-0230

Name	Ed Cullinan
Organization	Nova Scotia Power
Role on this project	Product Development
Experience	Multiple years in Utility Innovation.
Email	ed.cullinan@nspower.ca
Phone	(902) 943-7704

Name	Shawn Connell
Organization	Nova Scotia Power
Role on this project	Project Sponsor
Experience	Multiple years leading Customer Solutions at NS Power.
Email	shawn.connell@nspower.ca
Phone	(902) 220-2180

Name	Rebecca Costello
Organization	Nova Scotia Power
Role on this project	Technical Advice
Experience	Multiple years leading projects.
Email	rebecca.costello@nspower.ca
Phone	(902) 599-0384

Name	Sergio Sanabria
Organization	Nova Scotia Power
Role on this project	Construction and commissioning
Experience	Multiple years of experience building and operating solar projects.
Email	sergio.sanabria@nspower.ca
Phone	(902) 599-1316

NATURAL RESOURCES CANADA

SGNS Annual Performance Report

PROJECT CONTRIBUTORS

Partner Name	Strategic Innovation Fund
Organization Type	Government of Canada

Partner Name	Province of Nova Scotia
Organization Type	Provincial Government

PROJECT CONTRIBUTORS

Partner Name	Strategic Innovation Fund
Partner Type	Cash
Fiscal Year	2021-22
Amount ($)	738,299
Partner Role	–
Funding Details	–

Partner Name	Province of Nova Scotia
Partner Type	Cash
Fiscal Year	2021-22
Amount ($)	200,000
Partner Role	–
Funding Details	–

NON-FINANCIAL PARTNERS

Name	Siemens
Type	For-profit organization – large (500+ employees)
Role	Supplier of Energy System Platform
Secured	Yes

PROJECT LOCATIONS

Street No.	1223	Country	Canada
Street Name	Lower Water	Postal Code	B3J 3S8
Street Type	Street	Status	Active
Suite/Unit No.	–	Location Type	Corp

NATURAL RESOURCES CANADA

SGNS Annual Performance Report

City or Region	Halifax	Latitude	44.64547° N
Province/Territory	Nova Scotia	Longitude	-63.5766° E

2 – WEB HIGHLIGHTS

Title of Highlight	Details & Description of Highlight
NS Power Program Design	• Customer selection for distributed batteries completed. • C&I customer contracts are complete. Construction nearing completion. • The Solar Garden Rate Rider was approved by the NSUARB on 10 November 2021 with a communication to customers that generation would in Q1 2022. By the end of Q1 2022, the program was ~40% subscribed by applicants from across the province.
Energy System Platform	• Release 3b guided UAT & training completed. Release 3c scope definition and design ongoing. • A new version of the Siemens ESP User Guide was developed to incorporate the new functionality implemented.

WEB HIGHLIGHTS ATTACHMENT (OPTIONAL)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

3 – KNOWLEDGE & MEDIA PRODUCTS

Knowledge products include publications in peer-reviewed publications, presentations at scientific conferences, technical reports, patents, licences, etc. that were published/filed/obtained during this fiscal year. This category also includes any contributions from your projects towards the update or creation of policies, regulations, codes or standards; any contributions made during this fiscal year can be counted, even if the final document will only be published in a future fiscal year.

Media products include press releases, news coverage, etc.

Did you produce or contribute to any knowledge products this year? Yes
(Do not include media products in this response)

Product	Type	Description/Weblink
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=54Vc6TzUp4I

Product	Type	Description/Weblink
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=a7-fJh-N7gl
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=beFBuHv5GA8

KNOWLEDGE & MEDIA PRODUCTS ATTACHMENTS (OPTIONAL)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

4 – PERFORMANCE MEASURES

TECHNOLOGY READINESS LEVEL TARGETS & PROGRESS

Please enter the current technology readiness-level of the project. The start and forecast data was provided during proposal submission, and validated during the due diligence phase.

Technology Readiness Level at start of project:	select a value
Forecast Technology Readiness Level Target at end of project:	select a value
Updated Forecasted Technology Readiness Level Target at end of project (if applicable):	TRL 7 – prototype near or at planned operational system
Current Technology Readiness Level:	TRL 7 – prototype near or at planned operational system

Provide rationale for TRL changes and/or progress

Solar installations are complete and commissioning is complete at some locations. Data integration to Energy System Platform has started. It is possible that this project will approach TRL 8 or 9 over the next year as the learnings/knowledge is gained on the equipment and data.

ENVIRONMENTAL IMPACT TARGETS & PROGRESS

You completed an *Environmental Impacts Template* as part of your project proposal. Refer to that template when completing this section and, if necessary, complete and upload an updated *Environmental Impacts Template*.

NATURAL RESOURCES CANADA

SGNS Annual Performance Report

For the forecasts, include only activities and impacts in Canada; do not include international impacts. If you expect significant international impacts, you may enter these in the *Other project-specific performance targets* section.

GREENHOUSE GAS (GHG) REDUCTIONS (tCO_2e)

Please enter the current technology readiness-level of the project. The start and forecast data was provided during proposal submission, and validated during the due diligence phase.

Annual project GHG reductions in this fiscal year (tCO_2e):	0
Forecasted annual project GHG reductions at project completion date, as of last report (tCO_2e):	–
Updated forecasted annual project GHG reductions at project completion date (tCO_2e):	0
Market Impact Forecast Annual GHG Reductions by 2030:	–
Updated Market Impact Forecast Annual GHG Reductions by 2030:	0
Market Impact Forecast Annual GHG Reductions by 2050:	–
Updated Market Impact Forecast Annual GHG Reductions by 2050:	0

If the forecasted values, above, have changed, please provide clarification as to why

n/a

ENVIRONMENTAL IMPACTS TEMPLATE (OPTIONAL)

Document Type	Document Name	Actions
n/a	n/a	n/a

5 – TRAINING, EMPLOYMENT & DIVERSITY

EMPLOYMENT & HIGHLY QUALIFIED PERSONNEL

The training and employment information you provide below helps to quantify the economic impact of your project and its contribution to developing a skilled workforce that can continue to advance the clean energy economy into the future. Please see the Guide for detailed information on how to report this information below, including examples.

Reporting data on gender and Indigenous identity among your project team members provides information on the participation of groups that have historically been under-represented within the science, technology, engineering, and natural resource sectors. This, in turn, helps guide initiatives to increase their participation, such as Equal by 30. Please see the Guide for detailed information on how to report this information below, including tips on how to gather the information in a manner that respects confidentiality. As gender information is self-reported on a voluntary basis, it is understood that the sum of the gender-based breakdowns reported below may be less than the total numbers reported (if some team members prefer not to report on their gender).

If fields are not applicable, please enter "n/a" and provide an explanation in "Details" below. Note: reporting of data on gender and Indigenous identity is optional.

Has your organization signed on to diversity-related initiatives such as Equal by 30?	No	Does your organization have a diversity and inclusion plan?	Yes

If yes, briefly describe its measures

Nova Scotia Power has been intentionally focusing on awareness building and celebrating diversity and inclusion since 2018. Employees in many areas of the business describe feeling a distinct positive shift in the conversations that occur and the openness to learning that they experience. Our Employee Engagement Survey shows an increase in positive responses on the inclusion questions against our previous survey and against high-performing companies.

We want to understand the extent to which our organization reflects the broader labour market, and work to ensure that we remove barriers to those who haven't been, or don't feel that they belong. We have captured self-identified demographic data that we will use.

This is an ambition plan with associated general timelines that will take us to the end of 2024 and beyond:

- Educate, celebrate, & communicate
- Understand DEI data & metrics
- Attract & retain people
- Lead & be accountable
- Listen to & serve society

NATURAL RESOURCES CANADA

SGNS Annual Performance Report

TRAINING OF HIGHLY QUALIFIED PERSONNEL (HPQs)

Total number of individual HQPs trained during this fiscal year: 50			
Number of HQPs trained during this fiscal year: female	17	Number of HQPs trained during this fiscal year: male	33
Number of HQPs trained during this fiscal year: gender-diverse	n/a	Number of HQPs trained during this fiscal year who identify as First Nations, Inuit, and Métis Peoples	n/a

Total time spent training HQPs in this fiscal year (in months): 0.5			
Time spent training HQPs in this fiscal year: female (in months)	0.15	Time spent training HQPs in this fiscal year: male (in months)	0.35
Time spent training HQPs in this fiscal year: gender-diverse (in months)	n/a	Time spent training HQPs in this fiscal year for people who identify as First Nations, Inuit, and Métis Peoples (in months)	n/a

EMPLOYMENT

Total number of individual people employed during this fiscal year: 9			
Number of people employed during this fiscal year: female	3	Number of people employed during this fiscal year: male	6
Number of people employed during this fiscal year: gender-diverse	n/a	Number of people employed during this fiscal year who identify as First Nations, Inuit, and Métis Peoples	n/a

Total employment in this fiscal year (in job-years): 6			
Employment in this fiscal year: female (in job-years)	2	Employment in this fiscal year: male (in job-years)	4
Employment in this fiscal year: gender-diverse (in job-years)	n/a	Employment in this fiscal year for people who identify as First Nations, Inuit, and Métis Peoples (in job-years)	n/a

6 – ECONOMIC IMPACTS

% cost reduction in $/unit (where applicable)	0
$ from new revenue stream (where applicable)	$0.00

Other economic indicator, please specify:

n/a

7 – OTHER PROJECT-SPECIFIC PERFORMANCE TARGETS

Type	Socio-economic
Description	% subscribed customers to solar garden
Target by end of Follow-on Period	100%
Current Value	40%
Target Met?	No
Rationale	Recruitment of customers to utilize newly built solar garden.

Type	Technical
Description	C&I solar customers commissioned
Target by end of Follow-on Period	3
Current Value	0
Target Met?	No
Rationale	On track to commission by end of Q3 2022.

Additional details:

n/a

8 – COVID-19 IMPACTS

Impacts due to COVID have delayed the project: Somewhat delayed[1]

Provide details:

COVID restrictions resulted in only minor delays to the installation of the distributed batteries.

[1] Somewhat delayed – project deliverables are behind schedule, with less than 15% impact on the project budget this fiscal year; Considerably delayed – project deliverables are behind schedule, with more than 15% impact on project budget this fiscal year.

NATURAL RESOURCES CANADA

EVID Annual Performance Report

1 – PROJECT INFORMATION

Case File Number	GI-EVID-192
Program	Green Infrastructure – EVID
Proponent	Nova Scotia Power Inc.
Project Title	Nova Scotia Vehicle Grid Integration Pilot
Reporting Fiscal Year	2021/22
Project Completion Date (per CA)	31 Jul 2023
Submission Date	Thu, 28 Jul 2022

PROJECT TEAM MEMBERS

Name	Sanjeev Pushkarna
Organization	Nova Scotia Power
Role on this project	Project Lead
Experience	Multiple years leading customer solutions products and projects within Nova Scotia Power.
Email	sanjeev.pushkarna@nspower.ca
Phone	(902) 478-3307

Name	Sean Brennan
Organization	Nova Scotia Power
Role on this project	Funding Management and Reporting
Experience	Multiple years of project management and stakeholder management within Nova Scotia Power.
Email	sean.brennan@nspower.ca
Phone	(902) 220-1114

Name	Shawn Connell
Organization	Nova Scotia Power
Role on this project	Project Sponsor
Experience	Multiple years leading Customer Solutions team and programs.
Email	shawn.connell@nspower.ca
Phone	(902) 220-2180

NATURAL RESOURCES CANADA

EVID Annual Performance Report

Name	Ash Abdelrahman
Organization	Nova Scotia Power
Role on this project	Technical/Engineering Support
Experience	Multiple years in T&D and Power Production Operations with NS Power.
Email	ashraf.abdelrahman@nspower.ca
Phone	(902) 225-9865

Name	Ed Cullinan
Organization	Nova Scotia Power
Role on this project	Product Development
Experience	Multiple years experience with Utility Innovation programs.
Email	ed.cullinan@nspower.ca
Phone	(902) 943-7704

Name	Rob Boone
Organization	Nova Scotia Power
Role on this project	Technical/Engineering Support
Experience	Multiple years in T&D Engineering with NS Power.
Email	robert.boone@nspower.ca
Phone	(902) 574-0230

Name	Chris Cruickshank
Organization	Nova Scotia Power
Role on this project	IT/Data Support
Experience	Multiple years experience in leading IT projects and implementation
Email	chris.cruickshank@nspower.ca
Phone	(902) 237-3001

PROJECT CONTRIBUTORS

Partner Name	NRCan
Organization Type	Government of Canada

Partner Name	Nova Scotia Community College
Organization Type	Post Secondary Institutions

NATURAL RESOURCES CANADA

EVID Annual Performance Report

PROJECT CONTRIBUTORS

Partner Name	NRCan
Partner Type	Cash
Fiscal Year	2021-22
Amount ($)	760,000
Partner Role	Funding and Research
Funding Details	Quarterly claim process based on financial statements of project spend

Partner Name	Nova Scotia Community College
Partner Type	In-kind
Fiscal Year	2021-22
Amount ($)	–
Partner Role	Provide testing facility and resources to test equipment
Funding Details	n/a

NON-FINANCIAL PARTNERS

n/a

PROJECT LOCATIONS

Street No.	1223	Country	Canada
Street Name	Lower Water	Postal Code	B3J 3S8
Street Type	Street	Status	Active
Suite/Unit No.	–	Location Type	HQ
City or Region	Halifax	Latitude	44.64547° N
Province/Territory	Nova Scotia	Longitude	-63.5766° E

NATURAL RESOURCES CANADA

EVID Annual Performance Report

2 – WEB HIGHLIGHTS

Title of Highlight	Details & Description of Highlight
Nova Scotia Power EVID Update to 31 March 2022	The Nova Scotia Power (NSP) Electric Vehicle Integration project progressed this quarter with continued use case testing for different load leveling scenarios and for generation contingency. New bidirectional chargers are still planned for install as they become available in North American over the coming year. An additional electric vehicle telematics platform was added to the project scope in order to explore a new approach to EV charging control.

WEB HIGHLIGHTS ATTACHMENT (OPTIONAL)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

3 – KNOWLEDGE & MEDIA PRODUCTS

Knowledge products include publications in peer-reviewed publications, presentations at scientific conferences, technical reports, patents, licences, etc. that were published/filed/obtained during this fiscal year. This category also includes any contributions from your projects towards the update or creation of policies, regulations, codes or standards; any contributions made during this fiscal year can be counted, even if the final document will only be published in a future fiscal year.

Media products include press releases, news coverage, etc.

Did you produce or contribute to any knowledge products this year? Yes
(Do not include media products in this response)

Product	Type	Description/Weblink
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=a7-fJh-N7gl
Knowledge	Other	Sanjeev Pushkarna – Smart Energy Event Presentation – 26 Apr 2022
Knowledge	Other	NS Power Lunch and Learn EV – Sanjeev Pushkarna – 20 Apr 2022
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=rnuUjAdp3dM
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=o-MHDTz0m4w

NATURAL RESOURCES CANADA

EVID Annual Performance Report

Product	Type	Description/Weblink
Media	Media product, news coverage, etc.	https://www.youtube.com/watch?v=dx_MF-k5yal
Knowledge	Other	2020 Cumberland Energy Authority Symposium – Project mention as part of innovation and electrification presentation (Shawn Connell)
Knowledge	Other	25 Feb 2021 – Atlantic Centre for Energy – Peter Gregg, Guest Speaker. SGNS mentioned under Electrification and Innovation section
Knowledge	Other	26 Feb 2021 – 5th EnergyDATA Workshop – Debra McLellan Panelist. Panel discussion on EV innovation
Knowledge	Other	20 Apr 2021 – 2021 Smart Energy Conference – Peter Gregg, Keynote Speaker. SGNS mentioned under Innovation and Technology section
Knowledge	Other	28 Apr 2021 – Canadian Renewable Energy Association Spring Forward event – Peter Gregg, Fireside Chat

KNOWLEDGE & MEDIA PRODUCTS ATTACHMENTS (OPTIONAL)

Title of Photo	Photo Caption	Detailed Description
n/a	n/a	n/a

Note – these images may be used on the NRCan webpage

NATURAL RESOURCES CANADA

EVID Annual Performance Report

4 – PERFORMANCE MEASURES

TECHNOLOGY READINESS LEVEL TARGETS & PROGRESS

Please enter the current technology readiness-level of the project. The start and forecast data was provided during proposal submission, and validated during the due diligence phase.

Technology Readiness Level at start of project:	select a value
Forecast Technology Readiness Level Target at end of project:	select a value
Updated Forecasted Technology Readiness Level Target at end of project (if applicable):	TRL 9 – system proven through successful demonstration
Current Technology Readiness Level:	TRL 9 – system proven through successful demonstration

Provide rationale for TRL changes and/or progress

V2G charging technology has advanced since the proposal such that multiple devices are now commercially available.

ENVIRONMENTAL IMPACT TARGETS & PROGRESS

You completed an *Environmental Impacts Template* as part of your project proposal. Refer to that template when completing this section and, if necessary, complete and upload an updated *Environmental Impacts Template*.

For the forecasts, include only activities and impacts in Canada; do not include international impacts. If you expect significant international impacts, you may enter these in the *Other project-specific performance targets* section.

GREENHOUSE GAS (GHG) REDUCTIONS (TCO2E)

Please enter the current technology readiness-level of the project. The start and forecast data was provided during proposal submission, and validated during the due diligence phase.

Annual project GHG reductions in this fiscal year (tCO_2e):	0
Forecasted annual project GHG reductions at project completion date, as of last report (tCO_2e):	–
Updated forecasted annual project GHG reductions at project completion date (tCO_2e):	0
Market Impact Forecast Annual GHG Reductions by 2030:	–

Updated Market Impact Forecast Annual GHG Reductions by 2030:	0
Market Impact Forecast Annual GHG Reductions by 2050:	–
Updated Market Impact Forecast Annual GHG Reductions by 2050:	0

If the forecasted values, above, have changed, please provide clarification as to why

n/a

ENVIRONMENTAL IMPACTS TEMPLATE (OPTIONAL)

Document Type	Document Name	Actions
n/a	n/a	n/a

NATURAL RESOURCES CANADA

EVID Annual Performance Report

5 – TRAINING, EMPLOYMENT & DIVERSITY

EMPLOYMENT & HIGHLY QUALIFIED PERSONNEL

The training and employment information you provide below helps to quantify the economic impact of your project and its contribution to developing a skilled workforce that can continue to advance the clean energy economy into the future. Please see the Guide for detailed information on how to report this information below, including examples.

Reporting data on gender and Indigenous identity among your project team members provides information on the participation of groups that have historically been under-represented within the science, technology, engineering, and natural resource sectors. This, in turn, helps guide initiatives to increase their participation, such as Equal by 30. Please see the Guide for detailed information on how to report this information below, including tips on how to gather the information in a manner that respects confidentiality. As gender information is self-reported on a voluntary basis, it is understood that the sum of the gender-based breakdowns reported below may be less than the total numbers reported (if some team members prefer not to report on their gender).

If fields are not applicable, please enter "n/a" and provide an explanation in "Details" below. Note: reporting of data on gender and Indigenous identity is optional.

Has your organization signed on to diversity-related initiatives such as Equal by 30?	No	Does your organization have a diversity and inclusion plan?	Yes

If yes, briefly describe its measures

Nova Scotia Power has been intentionally focusing on awareness building and celebrating diversity and inclusion since 2018. Employees in many areas of the business describe feeling a distinct positive shift in the conversations that occur and the openness to learning that they experience. Our Employee Engagement Survey shows an increase in positive responses on the inclusion questions against our previous survey and against high-performing companies.

We want to understand the extent to which our organization reflects the broader labour market, and work to ensure that we remove barriers to those who haven't been, or don't feel that they belong. We have captured self-identified demographic data that we will use.

This is an ambition plan with associated general timelines that will take us to the end of 2024 and beyond:

- Educate, celebrate, & communicate
- Understand DEI data & metrics
- Attract & retain people
- Lead & be accountable
- Listen to & serve society

NATURAL RESOURCES CANADA

EVID Annual Performance Report

TRAINING OF HIGHLY QUALIFIED PERSONNEL (HPQs)

Total number of individual HQPs trained during this fiscal year: 50			
Number of HQPs trained during this fiscal year: female	17	Number of HQPs trained during this fiscal year: male	33
Number of HQPs trained during this fiscal year: gender-diverse	n/a	Number of HQPs trained during this fiscal year who identify as First Nations, Inuit, and Métis Peoples	n/a

Total time spent training HQPs in this fiscal year (in months): 0.5			
Time spent training HQPs in this fiscal year: female (in months)	0.15	Time spent training HQPs in this fiscal year: male (in months)	0.35
Time spent training HQPs in this fiscal year: gender-diverse (in months)	n/a	Time spent training HQPs in this fiscal year for people who identify as First Nations, Inuit, and Métis Peoples (in months)	n/a

EMPLOYMENT

Total number of individual people employed during this fiscal year: 8			
Number of people employed during this fiscal year: female	3	Number of people employed during this fiscal year: male	5
Number of people employed during this fiscal year: gender-diverse	n/a	Number of people employed during this fiscal year who identify as First Nations, Inuit, and Métis Peoples	n/a

Total employment in this fiscal year (in job-years): 5			
Employment in this fiscal year: female (in job-years)	1.5	Employment in this fiscal year: male (in job-years)	3.5
Employment in this fiscal year: gender-diverse (in job-years)	n/a	Employment in this fiscal year for people who identify as First Nations, Inuit, and Métis Peoples (in job-years)	n/a

6 – ECONOMIC IMPACTS

% cost reduction in $/unit (where applicable)	0
$ from new revenue stream (where applicable)	$0.00

Other economic indicator, please specify:

n/a

NATURAL RESOURCES CANADA

EVID Annual Performance Report

7 – OTHER PROJECT-SPECIFIC PERFORMANCE TARGETS

Type	Technical
Description	Number of bi-directionally capable EV charging stations in the operation
Target by end of Follow-on Period	3
Current Value	1
Target Met?	No
Rationale	New technology, attempting to implement in multiple locations.

Type	Technical
Description	Number of individual vehicles using the V2G capability
Target by end of Follow-on Period	3
Current Value	2
Target Met?	No
Rationale	For each bi-directional charger there is at least one vehicle utilizing the new capability.

Type	Codes & standards
Description	Number of codes, standards, policies, or regulations impacted
Target by end of Follow-on Period	8
Current Value	0
Target Met?	No
Rationale	For bi-directional charging to become mainstream in NS, there are adjustments and/or new codes and standards required. The testing performed from this pilot will help write these documents.
Type	Technical
Description	Number of patents (all partners)
Target by end of Follow-on Period	3
Current Value	0
Target Met?	No
Rationale	Patents for bi-directional charging.

Type	Technical
Description	Technology readiness level of V2G technology for utility applications
Target by end of Follow-on Period	6
Current Value	6
Target Met?	Yes
Rationale	Target met.

Additional details:

n/a

8 – COVID-19 IMPACTS

Impacts due to COVID have delayed the project: Somewhat delayed[1]

Provide details:

Availability of product (chargers) has been delayed due to COVID-19

[1] Somewhat delayed – project deliverables are behind schedule, with less than 15% impact on the project budget this fiscal year; Considerably delayed – project deliverables are behind schedule, with more than 15% impact on project budget this fiscal year.

Select Prefered Lanugauge / sélectionnez votre préféré
English



Strategic Innovation Fund FY 2020-21 Annual Performance Benefits Report (APBR)

Thank you for your participation in the SIF program. The investments being made through your project and others like it are generating meaningful results for Canada and for Canadians. Innovation Canada is proud to be a co-investor on these projects.

The Annual Performance Benefits Report (APBR) is an important exercise. The data gathered through this questionnaire will let us measure the benefits generated by SIF-funded projects and report on how the program is meeting its objectives of generating high-quality jobs, fostering growth, and helping companies to innovate.

The Annual Performance Benefits Report data will also help SIF effectively communicate to Canadians the impact that our co-investments are having on Canada's economy. Along with other sources of information, this data is critical to helping build the case for the ongoing relevance of the program.

Please consult the Guidance and Definitions links (beside each section of the questionnaire) for general instructions on how to complete this questionnaire, as well as guidance around specific sections.

Note that data provided on the Annual Performance Benefits Report will not be published, except at an aggregate level to speak to the impact of the SIF program at a high level. All information provided will be treated as business confidential. It will not be shared outside the Government of Canada without your consent and data will only be published at a highly-aggregated level. Please be assured that if we do receive an access to information request regarding your company, we will not release any confidential information. You will always be consulted prior to any third party information related to your company being released under an access to information request (unless this information is already public).

Note also that if needed, estimates are acceptable on the APBR for data that are not readily available.

APBR FAQ and General Guidance

Begin Questionnaire

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Project and Client Data

Need Help? Refer to the Guidance and Definitions

Section 1: Client Data

Guidance and Definitions

Client Details

		Notes / Comments (Please note if estimates and/or different definitions of concepts were used)
Business or Institution's legal name	Nova Scotia Power Incorporated	
Business or Institution's operating name	Nova Scotia Power Incorporated	
Business Number (i.e., Canada Revenue Agency Number)	647281607	
Select your client type	(3) Main Partner (Partnership / Network / Consortium projects)	
Select your client status	(1) For-profit	
Percentage of Canadian ownership (for-profit clients only) (for example, Input 100 for fully Canadian-owned or 0 for fully foreign-owned)	100%	
Select the month in which your business or institution's fiscal year ends.		
Guidance and Definitions — Month	(12) December	

Based on your selection above, this APBR must reflect information between the following dates:		
(Automatic) Fiscal Year Start:	2020-01-01	
(Automatic) Fiscal Year End:	2020-12-31	

Project Details

Project start date (format YYYY-MM-DD)	2018-09-14	
Estimated project completion date (format YYYY-MM-DD)	2023-03-31	
Guidance and Definitions — Project Name	Smart Grid Atlantic	
SIF Stream:	Stream 1	
SIF Project ID	812712	
Will this project support a new or retained R&D or production mandate?	(2) No	
Does your business or institution act as an intermediary on this project?	(2) No	

SIF defines a full-time equivalent (FTE) as 2,000 hours worked per year. On the APBR, please represent all employment figures as FTEs. If your definition of FTE varies from the SIF definition, please provide the number of hours worked per year you use to calculate an FTE here		
Hours used to calculate FTE:	1,950	

Guidance and Definitions — ***Please enter/confirm your address information below:***		
Location name (the name of this establishment, facility, branch, work site, etc.)	Nova Scotia Power 1H	
Street Address	1223 Lower Water St.	
Postal Code	B3J 3S8	
City	Halifax	
Province or Territory	Nova Scotia	
Location Description (a brief phrase to describe location, e.g. Headquarters, testing facility, research centre, etc.)	Head Quarter	

Guidance and Definitions — Between Jan 2020 and Dec 2020,have project activities occurred at any location other than the primary address listed above?	(1) Yes	
Please fill out the project location table by clicking the link to the right to add additional details->	Project Location Table	

Multiple Business Number Clients (for-profit clients only):

If multiple affiliated companies within your enterprise are associated with the SIF project or contribution agreement (e.g. a contribution agreement commitment includes the recipient and its affiliates) the business number provided above should be the main business number associated with the SIF project. Please also provide the business numbers and details of your affiliated companies are associated with the SIF project in Complex Enterprise data sheet by clicking the link to the right.

Guidance and Definitions — Please provide the business numbers and details of your affiliated companies that are associated with the SIF project in Complex Enterprise data sheet by clicking the link to the right.	Complex Enterprise Data Sheet	
Guidance and Definitions — Has your enterprise filled out an APBR for this project in a previous year?	(1) Yes	

Project Spending

	Valid	
Between Jan 2020 and Dec 2020, what was the total spending of your business or institution on the SIF-funded project? Include all costs associated with the project, from all sources of funds (including own-funds). Note: On project spending should include all costs incurred by the respondent, that were related to the project in this fiscal year. This includes purchases of goods and services related to the project (see Canadian Suppliers Block, below) as well as internal costs such as wages for employees.	$3,488,606.00	
If the SIF-funded project is part or component of a larger project, please indicate total expenditures by your business or institution towards this larger project in the past fiscal year.	$4,319,638.00	

Canadian Suppliers Block (for-profit only)

	Valid	
Guidance and Definitions — 1) Between Jan 2020 and Dec 2020, what were your business's total purchases of goods and services? Provide an estimate.	$303,184,864.00	
a) Of the total in 1), what amount was purchased from Canadian suppliers?:	$285,998,710.00	
2) Between Jan 2020 and Dec 2020, what were your business's total purchases of goods and services on the project? Provide an estimate.	$2,940,161.00	
a) Of the total in 2), what amount was purchased from Canadian suppliers?:	$2,527,766.00	

Revenues (for-profit only)

	Valid	
Guidance and Definitions — 1) Between Jan 2020 and Dec 2020, what were your business's total gross business revenues of Canadian operations (include revenues from licensing):	$1,494,000,000	
a) Of the total in 1), what amount was generated from foreign markets:		
i) United States	$0	
ii) Mexico	$0	
iii) EU	$0	
iv) Other Foreign Markets	$0	

COVID-19 Impacts

1) Between Jan 2020 and Dec 2020, were there any COVID-induced disruptions to the core business activities?	(1) Yes	
a) If yes, please explain if the disruptions resulted in challenges or opportunities for the firm (text up to 450		
Non-essential project and customer work had to be paused. All employees had to relocate to remote-work and additional PPE and processes were implemented for essential field work, and once more customer-facing work could resume. Residential electricity use jumped, causing some residential customers concern over their bills, while commercial use drastically declined.		
2) Between Jan 2020 and Dec 2020, were there any direct COVID impacts on project activities?	(2) No	
a) If yes, please explain if the disruptions resulted in challenges or opportunities for the firm (text up to 450		
As most device deployments occurred in 2021, there were minimal impacts to the project in 2020 as preliminary work was being done that could be managed remotely.		
3) Between Jan 2020 and Dec 2020, did the company introduced any new products, processes, or services as a result of opportunities created by COVID-19?	(1) Yes	
4) Given COVID-19 disruptions to business activities, is the company planning to increase investment in R&D over the coming years?	(2) No	

Guidance and Definitions

Accessibility, Equity, Diversity, and Inclusion

If an estimate cannot be provided due to a lack of data, please enter the exact words 'not available' in the cell

What share of the organization is owned by women? Select the category that most closely applies.	(8) Not Available	NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's board and senior management is composed of women:		NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's workforce (not including senior management) is composed of women:		NSP began self-identification in 2021; data will be provided in subsequent reports
What share of the organization is owned by First Nations, Inuit, and Métis peoples? Select the category that most closely applies.	(8) Not Available	NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's board and senior management is composed of First Nations, Inuit, and Métis peoples:		NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's workforce (not including senior management) is composed of First Nations, Inuit, and Métis peoples:		NSP began self-identification in 2021; data will be provided in subsequent reports

What share of the organization is owned by black individuals?	(8) Not Available	NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's board and senior management is composed of black individuals:		NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's workforce (not including senior management) is composed of black individuals:		NSP began self-identification in 2021; data will be provided in subsequent reports
What share of the organization is owned by racialized individuals (not including Indigenous or black individuals)? Select the category that most closely applies.	(8) Not Available	NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's board and senior management is composed of racialized individuals (not including Indigenous or black individuals):		NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's workforce (not including senior management) is composed of racialized individuals (not including Indigenous or black individuals):		NSP began self-identification in 2021; data will be provided in subsequent reports
What share of the organization is owned by individuals with a disability (including invisible and episodic disabilities)? Select the category that most closely applies.	(8) Not Available	NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's board and senior management is composed of individuals with a disability (including invisible and episodic disabilities):		NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's workforce (not including senior management) is composed of individuals with a disability (including invisible and episodic disabilities):		NSP began self-identification in 2021; data will be provided in subsequent reports
What share of the organization is owned by individuals who identify as LGBTQ2? Select the category that most closely applies.	(8) Not Available	NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's board and senior management is composed of individuals who identify as LGBTQ2:		NSP began self-identification in 2021; data will be provided in subsequent reports
What percentage of the organization's workforce (not including senior management) is composed of individuals who identify as LGBTQ2:		NSP began self-identification in 2021; data will be provided in subsequent reports

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Need Help? Refer to the Guidance and Definitions

Section 2: Benefits Data

Guidance and Definitions

R&D - complete sections for business / institution - wide (left), as well as for project-specific R&D (right)

Business / Institution Wide	Valid	On Project	Invalid	Notes / Comments (Please note if estimates and/or different definitions of concepts were used)
1) Between Jan 2020 and Dec 2020, what were your gross Canadian expenditures on R&D?	$0	2) Between Jan 2020 and Dec 2020, what were your expenditures on R&D for or as a direct result of the project?	$ 1,438,679.02	
a) How much of this was for in-house R&D expenditures?		a) How much of this was for in-house R&D expenditures?	$ 1,438,679.02	
b) How much of this was expenditures for R&D was undertaken by external parties?		b) How much of this was expenditures for R&D was undertaken by external parties?	$0.00	
i) Parent, affiliated or subsidiaries, for R&D undertaken in Canada		i) Parent, affiliated or subsidiaries, for R&D undertaken in Canada		
ii) Other businesses, for R&D undertaken in Canada		ii) Other businesses, for R&D undertaken in Canada		
iii) Canadian universities or colleges		iii) Canadian universities or colleges		
iv) Other Canadian entity (e.g. not-for-profit, government research lab,		iv) Other Canadian entity (e.g. not-for-profit, government research lab,		
v) Parent, affiliated or subsidiaries, for R&D undertaken outside Canada		v) Parent, affiliated or subsidiaries, for R&D undertaken outside Canada		
vi) Foreign entity of any other type		vi) Foreign entity of any other type		
c) Of the amount in (a), how much consisted of R&D capital expenditures?		c) Of the amount in (a), how much consisted of R&D capital expenditures?	$ 1,438,679.02	

Guidance and Definitions

CAPEX - complete sections for business / institution - wide (left), as well as for project-specific CAPEX (right)

Business / Institution Wide	Valid	On Project	Invalid	
1) Between Jan 2020 and Dec 2020, what were your gross capital expenditures in Canada?:	$316,379.00	3) Between Jan 2020 and Dec 2020, what were your total capital expenditures in Canada related to the project:	$ 1,240,028.71	
a) Buildings & non-residential construction:	$19,718.00	a) Buildings & non-residential construction:		
b) Machinery and Equipment Investment:	$277,417.00	b) Machinery and Equipment Investment:		
i) Information and Communication Technology Equipment:	$9,371.00	i) Information and Communication Technology Equipment:	$123.75	
ii) Other M&E investment:	$268,046.00	ii) Other M&E investment:	$298,695.60	
c) Software	$19,090.00	c) Software	$941,209.36	
d) Other Capital Expenditures (e.g. land):	$154.00	d) Other Capital Expenditures (e.g. land):		
2) Of total CAPEX in (1) above, how much was 'Clean Tech'		4) Of the total CAPEX in (3) above, how much consisted of investment in 'clean tech'	$1,240,028.71	
		5) Were any of the above expenses (3) related to upgrading or expanding existing facilities?	(1) Yes	

Guidance and Definitions

Employment/FTEs (Full-time Equivalents) - complete sections for business / institution - wide (left), as well as for project-specific employment (right)

Business / Institution Wide	Valid	On Project	Valid	
1) What was your total Employment (FTEs) in Canada between Jan 2020 and Dec 2020:	1,951	3) Between Jan 2020 and Dec 2020, how many of your FTEs were directly employed by the project?	0	
Of the total in (1), above, how many were in the following occupations (estimate if necessary):		Of the total in (3), above, how many were in the following occupations (estimate if necessary):		
a) Management	269	a) Management		
b) Professional occupations in natural and applied sciences	163	b) Professional occupations in natural and applied sciences		Engineers (142), Environmental Sciences (11), F
c) Technical occupations in natural and applied sciences	37	c) Technical occupations in natural and applied sciences		Technologists, GIS Technicians and support rol
d) Other professional occupations	81	d) Other professional occupations		Senior Finance/Accounting roles (excluding ser
e) Trades (incl. construction) equipment operators and transport	685	e) Trades (incl. construction) equipment operators and transport		Unionized operational employees (E.g. Power E
f) Occupations in manufacturing and utilities	96	f) Occupations in manufacturing and utilities		Unionized Utilityworkers/Custodians
g) Other	620	g) Other		Remainder of employees
2) Of the total in (1), above, how many FTEs were "Highly Skilled"		4) Of the total in (3), above, how many FTEs were "Highly Skilled"		
		5) Of the FTEs reported in 3), how many FTEs were in positions that did not exist prior to the project's start date (Sep 14, 2018) (i.e., new FTEs)? Include only FTE's working in positions that did not exist with your business or institution before the SIF-funded project, and were hired to work on the SIF-funded project. These positions are new to your company relative to the start of the project, but not necessarily new in this fiscal year.		
		Of the total in (5), above, how many were in the following occupations (estimate if necessary):		
		a) Management		
		b) Professional occupations in natural and applied sciences		
		c) Technical occupations in natural and applied sciences		
		d) Other professional occupations		
		e) Trades (incl. construction) equipment operators and transport		
		f) Occupations in manufacturing and utilities		
		g) Other		
		6) Of the total in (5), above, how many FTEs were "Highly Skilled"		
		7) Between Jan 2020 and Dec 2020, how many external FTE positions were employed by the project? Include FTEs that were directly employed by the project, but did not work for your business or institution, such as construction workers and contractors who worked to establish a new facility but who were not your employees. Not all SIF clients are expected to provide this data, consult the guidance and definitions for more information.		
		Of the total in (7), above, how many were in the following occupations (estimate if necessary):		
		a) Management		
		b) Professional occupations in natural and applied sciences		
		c) Technical occupations in natural and applied sciences		
		d) Other professional occupations		
		e) Trades (incl. construction) equipment operators and transport		
		f) Occupations in manufacturing and utilities		
		g) Other		
		8) Of the total in (7), above, how many FTEs were "Highly Skilled"		

Guidance and Definitions

Intellectual Property and IP Protection

1) Has your business or institution developed a new IP strategy, or significantly modified its existing IP strategy, related to the project?	(2) No
2) Between Jan 2020 and Dec 2020, has your business or institution filed for any intellectual property protection as a result of activities undertaken on this project?	(2) No
b) Did your business or institution develop other IP as a result of the activities undertaken on this project, for which IP protection was not sought?	(2) No
3) Was your business or institution involved any licensing agreements related to the SIF-funded project between Jan 2020 and Dec 2020?	(2) No

Guidance and Definitions

Innovation	Valid
1) Between Jan 2020 and Dec 2020,has your business or institution developed any new or significantly improved products as a result of the project?	(2) No
2) Between Jan 2020 and Dec 2020, has your business or institution developed any new or significantly improved services as a result of the project?	(2) No

3) Between Jan 2020 and Dec 2020, has your business or institution developed any new or significantly improved processes as a result of the project?	(2) No	
4) Between Jan 2020 and Dec 2020, has your business or institution generated revenues from or brought to market any new or significantly improved products or services as a result of the project? Include estimates, if available, from new production line and process improvements.	(2) No	

↓ Continue down to question 5 ↓

5) Between Jan 2020 and Dec 2020, did your business or institution realise any cost savings from new or significantly improved processes developed as a result of the project?	(2) No	

Guidance and Definitions

Training (for-profit clients only)

1) Between Jan 2020 and Dec 2020, how many employees of your business began on the job training?	1,951	
a) Of 1), how many began training directly related to the project?	0	
2) Between Jan 2020 and Dec 2020, what is the total number of hours of on the job training provided to employees?	12	
a) Of 2), what is the total of hours of on the job training directly related to the	0	
3) Between Jan 2020 and Dec 2020, what were the total expenses on employee on the job training?		
a) Of 3) what were the total expenses on employee on the job training directly related to the project?	$0.00	

Guidance and Definitions

Co-Ops

	Valid	
1) Between Jan 2020 and Dec 2020, how many co-ops or interns began a placement at your business or institution? Please indicate the number of four month positions.	64	
2) Were any co-ops hired to work directly on the SIF-funded project?	(2) No	

Guidance and Definitions

Collaboration (for-profit clients only)

1) Was your business engaged in collaborations between Jan 2020 and Dec 2020 (e.g. contracts and partnerships for research or other innovation-related activities with other companies or with universities) as part of the SIF-funded project?	(2) No	

Confidentiality:

Note all information provided on the APBR exercise will be treated as confidential. Data will not be shared outside of the Government of Canada without your consent. Data will only be published at a highly-aggregated level to speak to the impact of the SIF program as a whole. If any of the information provided on the APBR exercise is particularly sensitive, please make a note of it here.

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Section 3: Additional Benefits and Commitments Tracking

Need Help? Refer to the Guidance and Definitions

Additional Commitments Type	Other
Additional Commitments Description	6.2.3 Conferences and Collaborations. (a) The Recipients will host a national conference to demonstrate the benefits and share the lessons learned of the project and to encourage and facilitate smart grid applications across Canada. The conference will be offered every second year with the first conference occurring during the year starting on April 1, 2021. Every major Canadian utility will be invited and encouraged to attend and the conference which will be open to all smart energy businesses, municipal leaders and planners, policymakers, regulators, NGOs, trades, engineers and training institutions. The outcomes and impacts of the collaborations created will be reported to ISED.
Progress Against Commitment (to be provided by client)	Will be included in 2021 report
Officer Assessment (to be completed / updated by project officer)	
Comments (to be completed / updated by project officer)	

Additional Commitments Type	Gender
Additional Commitments Description	6.2.4 Gender Equality and Diversity. (a) The Recipients will establish a company-wide, gender and diversity action plan for inclusive hiring practices within one (1) year of the Execution Date. This will include: o Outreach programs geared towards women in STEM technology platforms. o Best efforts to engage Indigenous Communities on labour market opportunities, making investments that support partnership, and raising awareness of careers in STEM. (b) The Recipients will provide the gender and diversity action plan to the Minister within one (1) year of the Execution Date.
Progress Against Commitment (to be provided by client)	Action plan developed and provided as required.
Officer Assessment (to be completed / updated by project officer)	
Comments (to be completed / updated by project officer)	

Additional Commitments Type	Cyber-Security
Additional Commitments Description	6.2.6 Cybersecurity (e) The Recipients will work to ensure that products developed as part of this project are privacy protected according to the CSA standard of the Personal Information Protection and Electronic Documents Act (PIPEDA), providing annual reports confirming its compliance with PIPEDA
Progress Against Commitment (to be provided by client)	There are no products developed by NSP that require privacy protection.
Officer Assessment (to be completed / updated by project officer)	
Comments (to be completed / updated by project officer)	

Additional Commitments Type	Environmental
Additional Commitments Description	Section 6.2.5 (d) NSP will build an additional 50MW of renewable (solar or wind) energy generation capacity in Nova Scotia by March 31, 2028.
Progress Against Commitment (to be provided by client)	Projects are in development.
Officer Assessment (to be completed / updated by project officer)	
Comments (to be completed / updated by project officer)	

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Validation Sheet

Need Help? Refer to the Guidance and Definitions

Please review and attest the responses provided by selecting 'Confirmed' in the Confirmation column. Once confirmed, you can submit via email by clicking "Ready to Submit" button below, or by attaching the completed workbook to the PDF form included in your launch package.

Table 1: Values Verification

Location:	Section:	Value:	Please confirm, in the next column to the right, if the following are correct:	Confirmation:
Project and Client Data	Canadian Ownership	100%	You have indicated your company is 100% Canadian owned, is this correct? Note: for publicly traded companies with no individual foreign entity controlling more than 10% of voting shares, then the company is considered to be 100% Canadian-owned. See Guidance and Definitions for more.	Confirmed
Project and Client Data	Revenue Block	1,494,000,000	You have indicated the company generated $1,494,000,000.00 in revenues in the past fiscal year, is this correct?	Confirmed
Benefits Data	R&D - Institution wide	0	You have indicated spending of $0.00 on institution-wide R&D in the past fiscal year, is this correct?	Confirmed
Benefits Data	R&D - On project	1,438,679	You have indicated spending of $1,438,679.02 on on-project R&D in the past fiscal year, is this correct?	Confirmed
Benefits Data	CAPEX - Institution wide	316,379	You have indicated spending of $316,379.00 on institution-wide capex in the past fiscal year, is this correct?	Confirmed
Benefits Data	CAPEX - On project	1,240,029	You have indicated spending of $0.00 on on-project capex in the past fiscal year, is this correct?	
Benefits Data	Innovation	0	You have indicated the company generated $0.00 in revenues, resulting from the sale of new or significantly improved products and services in the past fiscal year, is this correct?	Confirmed
Project and Client Data	Expenditure on goods and services from Canadian suppliers in the past year	303,184,864	You have indicated spending of $303,184,864.00 on purchases of goods and services from Canadian suppliers in the past fiscal year, is this correct?	Confirmed
Baseline Data Table	Revenues of Canadian Operations	0	You have indicated the highest revenue generated over the baseline period is $0.00, is this correct?	Confirmed
Baseline Data Table	Canadian Expenditure on R&D	0	You have indicated the highest yearly R&D expenditure over the baseline period is $0.00, is this correct?	Confirmed
Baseline Data Table	Expenditure on goods and services from Canadian suppliers	0	You have indicated the highest yearly spending on purchases of goods and services from Canadian suppliers over the baseline period is $0.00, is this correct?	Confirmed

Table 2: Data Sheet Completion Validation

Data Sheet	Number of Entries	APBR 2020-21 Requirements:	Confirmation:
← Additional Benefits Tab	4	There are 4 additional Contribution Aggreement (CA) commitment(s) and benefit(s) that are to be tracked. Please confirm the Additional Benefits tab has been completed.	Confirmed
←Project Location Table	8	You have indicated that project activities have taken place at location(s) in addition to the project's primary address. There are currently 8 entries s in the Project Location Table. Is this correct?	Confirmed
← Complex Enterprise DS	0	You have indicated that your business is not a complex enterprise (i.e., an enterprise with multiple affliates working on the project). Is this correct?	Confirmed
←Collaboration Data Sheet	0	You have indicated that your business was NOT engaged in a colloration directly related to the SIF funded project during your fiscal year ending Dec, 2020 . There are currently 0 entries in the Collaboration Table. Is this Correct?	Confirmed
← Co-Ops Data Sheet	0	You have indicated that your business or institution DID NOT hire Co-Ops students to work directly on the SIF funded project during your fiscal year ending Dec, 2020 . There are currently 0 entries in the Co-Ops Table. Is this correct?	Confirmed
← Licensing Data Sheet	0	You have indicated that your business was NOT engaged in a colloration during your fiscal year ending Dec, 2020 . There are currently 0 entries in the Collaboration Table. Is this correct?	Confirmed
← Patent Application Data Sheet	0	You have indicated that your business or institution did not file a patent application(s) in your fiscal year ending Dec, 2020. There are currently 0 entries in the Patent Application Table. Is this correct?	Confirmed

Table 3: Data Validation

Block:	Validation:	Data rule(s):
Project Spending	Valid	If the SIF funded project is part of a larger project, on project spending must be less than total project expenditures
Canadian Suppliers Section	Valid	1. Amount spent on project cannot exceed total company / institution-wide purchases 2. Amount spent on the project cannot exceed total project spending 3. Amount spent company / institution-wide on canadian suppliers cannot exceed total goods and services purchased 4. Amount spent on project on canadian suppliers cannot exceed total goods and services purchased
Revenues	Valid	Revenues from foreign markets is less than or equal to total revenues
Institution wide expenditure - R&D	Valid	1. Total R&D is sum of R&D performed in-house and performed by external parties 2. R&D performed by external parties is equal to the sum of the subcategories 3. R&D capital expenditure is less than or equal to in-house R&D
On-Project expenditure - R&D	Invalid	1. Each category of on-project R&D is less than or equal to the same category for company / institution-wide R&D (in the same row) 2. On-project total R&D is the sum R&D performed in-house and performed by external parties 3. On-project R&D performed by external parties is the sum of the subcategories 4. On-project R&D capital expenditure is less than or equal to total R&D expenditures
CAPEX - Institution wide	Valid	1. Total CAPEX is equal to the sum of its subcategories 2. Machinery and Equipment is equal to the sum of its subcategories 3. Clean-Tech CAPEX cannot exceed total CAPEX
CAPEX - On-Project	Invalid	1. Each category of on-project CAPEX is less than or equal to the same category for company / institution-wide CAPEX (in the same row) 2. Total CAPEX is equal to the sum of its subcategories 3. On-project Machinery and Equipment is equal to the sum of its subcategories 4. On-project Clean-Tech CAPEX cannot exceed total CAPEX
Employment - Institution wide	Valid	1. Total employment is equal to the sum of its subcategories 2. "Highly skilled" cannot exceed total employment 3. Usually "Highly skilled" would not be less than the sum of employees in b) to d)
Employment - On-Project	Valid	1. Each category of on-project Employment is less than or equal to the same category for company / institution-wide employment (in the same row) 2. On-project total employment is equal to the sum of its subcategories 3. Each row in on-project new employment is less than or equal to each row in on-project employment 4. "Highly skilled" employment cannot exceed total employment
Innovation	Valid	1. Revenues generated from foreign markets cannot exceed total revenues 2. Revenues generated from foreign markets is equal to the sum of its subcategories
Co-ops	Valid	The total number of Co-Ops reported in the Co-Ops Data Sheet cannot exceed the total number reported in the Benefits Data sheet
Licensing Data Sheet	Valid	1. Total revenues from licensing cannot exceed total revenues in the past fiscal year reported in Client and Project Data sheet 2. Total revenues from foreign licensing cannot exceed total revenues in the past fiscal year generated from foreign markets (reported in Client and Project Data Sheet)

Confidentiality:

Note all information provided on the APBR exercise will be treated as confidential. Data will not be shared outside of the Government of Canada without your consent. Data will only be published at a highly-aggregated level to speak to the impact of the SIF program as a whole.

Ready to Submit? Click here!

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Definitions and Reporting Guide

General Instructions

The APBR is intended to capture analytical data that can be used to report on SIF-funded projects, and benchmark these results to existing data sources (e.g. Statistics Canada surveys).

- Please provide data as per this guidelines document, which refers to Statistics Canada definitions.
- Please provide all monetary figures in 000's of Canadian dollars, unless otherwise specified.

Note that if data are not readily available, an estimate can be provided. For those questions where an estimated value has been provided, please note this in the comments box. Efforts should be made to keep estimates within 10% of the likely value.

Who should complete the APBR?

For projects with a single participant (sole recipient projects), the company or organization being supported by SIF is responsible for completing and submitting the APBR.
For partnership, network and consortium projects, the Lead Recipient (recipient on the Contribution Agreement) is responsible for submitting a completed APBR for itself, as well as for each of the Main Partners on the project. Please consult the instructions on multiple-client projects for more information.

Do I need to answer every question?

All sections of the APBR should be completed. If a section of the APBR does not apply to your project or business / institution, then it should still be completed to reflect this. For example, if no IP was generated by the project or licensed for the project, this question should be answered 'no', rather than left blank. Similarly, if your business / institution did not do any R&D spending last year, then the questions on R&D expenditures in the past year should be marked with a 0, rather than left blank.

Data sheets may be left blank if these do not apply. For example, if your business / institution did not engage any co-ops in the past fiscal year, then the co-ops data sheet does not need to be completed. The Benefits Data Tab provides instruction on when specific data sheets need to be completed.

Note information must be provided for project-related activities (e.g. R&D spend, CAPEX, Employment, etc.) regardless of whether these relate to a firm Contribution Agreement commitment. Estimates can be provided in instances where data are not readily available, but efforts should be made to keep estimates within 10% of the likely value.

What goes in the comment boxes?

The definitions used on the APBR may not always directly reflect your own accounting practices or how commitments are accounted for in contribution agreements. In cases where there is a variance between the APBR definition and your own accounting practices or contribution agreement commitments, please provide an explanation of the difference in the comment box under each section. If there is a variance between the APBR definition and the definition used to track progress against a contribution agreement commitment in this area, please also include the figure that represents progress against the contribution agreement commitment in the comments box. For example, legal and administrative work related to patents is excluded from the APBR / Statistics Canada definition of R&D. If your contribution agreement specified that these costs could be included against your R&D commitment, please adhere to the APBR / Statistics Canada definition of R&D for completing the APBR questions on R&D. In the comments box, please include total R&D inclusive of these additional costs.

Dropdowns

A number of the data sheets include dropdown selections. When inputting your data, please be cognisant of the options can be inputted into a dropdown cell. Please also try not to copy and paste over dropdowns. Inputting an invalid option into a dropdown cell may result in a longer data cleaning process and further follow-up calls to collect the proper data.

Unit Verification

This section will show the total monetary value summed from each data block. Please confirm if the data block totals are correct. If they are incorrect, navigate to the data block using the links on the left side of the sheet to make your changes. Please note that previous APBR collection years collected data as 000's. Data is now collected as exact dollar figures.

Data Validation

While filling in the form, please be aware of the data validation rules that need to be kept consistent to maintain data accuracy. Once you have filled in the form, the data validation section will indicate whether your data is valid, or if a data rule has been broken. Please comply with these rules in order to provide the most consistent data possible.

Who can I speak to for help on this?

If you have any questions on how to complete the APBR, please don't hesitate to be in touch with the Strategic Innovation Fund's Policy, Measurement and Reporting group. We recognise the effort that goes into providing this data to the program, and we are here to help in any way we can.

Section 1 – Project and Client Data

Client name: Client's legal and operating name.

Business number: Revenue Canada business number. For for-profit clients, if the client's activities on the SIF-funded project or contribution agreement commitments occur in more than one entity with a unique CRA business number (e.g. at an affiliate which reports its own taxes to the CRA), please also complete the Complex Enterprise data sheet.

Client Type:

Sole Recipient: The respondent is directly supported by SIF, and is the only proponent on the project.
Lead Recipient: The respondent is directly supported by SIF, but there are other main partners on the project. Note for network and consortium type projects, the Lead Recipient would also generally be an intermediary (see below).
Main Partner: The Main Partners of the project are entities other than the Lead Recipient, that nonetheless play a central role in the project. Main Partners of a project would include for example institutions and private sector enterprises that are undertaking a joint project with the Lead Recipient and play a major role on the project (other than in a capacity solely as a guarantor).

Client Status:

For Profit: Client is a for-profit business.
University / College: Respondent is a post-secondary institution.
Not-for-profit Research Institute: Respondent is a not-for-profit research institute.
Other non-profit: Respondent type is a non-profit and does not meet any of the above categories, e.g. a non-profit industry association.

Percentage Canadian Ownership: This question is only required for for-profit clients. Estimate as necessary. Please see case-specific guidance below for some common ownership structures of SIF clients, and contact SIF if you have any questions or these examples do not fit your case.

For Private Companies: Indicate the percentage of the company that is ultimately owned by Canadians or by firms incorporated in Canada (e.g. as determined by voting shares).

For Private Companies Wholly Owned by a Holding Company: If the company is owned by a Canadian holding company, but that holding company is ultimately owned by an entity outside of Canada, report the share of Canadian ownership associated with the highest level of ownership (ultimate parent). For example, Company A is a Canadian private company owned by Holding Company B. Holding Company B is 40% Canadian Owned, and 60% Foreign Owned. Company A is considered to be 40% Canadian Owned.

For Public Companies Headquartered in Canada: Any individual foreign entity that controls more than 10% of the voting shares should be considered as 'foreign ownership'. If no individual foreign entity controls more than 10% of the voting shares, then the company should be considered 100% Canadian owned. For example, Company X is a publicly traded Canadian company. Foreign Company Y owns 15% of its shares, and Foreign Investor Z owns 12% of its shares. Company X is considered to be 73% Canadian owned.

For Canadian Subsidiaries of Publicly Traded Companies Headquartered Abroad: The share of the Canadian subsidiary that is owned by a foreign-incorporated, publicly traded company, should be treated as foreign-owned. For example, if Canadian Subsidiary A is a wholly owned subsidiary of Foreign-HQ Public Company B, then Subsidiary A is considered to be 0% Canadian owned.

Fiscal Year: this question will align the APBR's data collection time period to the client's fiscal year. By selecting which month the client's fiscal year ends in, the APBR will automatically adhere to the most recent fiscal year available prior to this year's collection. If there are issues aligning these dates to the client's available data, please contact SIF.

SIF Stream: Select appropriate SIF Stream
SIF Project ID: This is the unique identifier associated with the SIF contribution agreement to support the project.
Project is for new / Retained R&D or Production Mandate: Identify whether this project supports a new or retained R&D or production mandate for the client.
Intermediary: Intermediaries are entities (often non-profits) that received SIF support specifically to provide services and/or funding (e.g. R&D collaboration, incubator / accelerator services, flow-through funding, etc.) to support innovation activities in other entities (generally for-profit firms, start-ups, etc.) The lead recipient on network / consortium projects would generally be an intermediary on the SIF project. A project-level APBR, including an intermediary data sheet should be provided for SIF projects that include intermediaries. Note that intermediary-type support is different from, for example, a SIF client undertaking a specific research collaboration with a university to advance its project, or a SIF client contracting research activities to an outside party. These should be captured in the collaborations data sheet associated with each client's APBR.

Client Primary Address: This is the primary address of the client's Canadian operations.
Location Description: A brief phrase or note to describe the location (e.g. headquarters, facility construction location, testing centre, etc.)

Project Location Table: If the client's activities on the project take place at a location other than the client's primary address, this information should be provided here. Please list all locations where project activities have taken place in the previous fiscal year. For example, if the client's primary address is its HQ in Toronto, but the SIF-supported project is research that takes place at a lab in Edmonton, the Edmonton location should be provided here. Note: this address should reflect the location of client's activities on the project in the past fiscal year, and not the address of a partner that is also undertaking its own work activities on the project. In cases where the SIF project is e.g. a joint research project, the client should not include the partners' address here, unless this address is the physical locations where the client performed its activities on the project.

Return to Project and Client Data Section

Complex Enterprise Data Sheet:
If the SIF-funded project implicates other affiliates (either through activities on the project, or through meeting Contribution Agreement benefits commitments), then the Complex Enterprise data sheet should be filled out and the company / institution wide information on the APBR benefits section, the baseline data section, and the project and client data section, should be provided for the recipient and any of its implicated affiliates, in aggregate (the 'reporting unit').

Return to Complex Enterprise Data Sheet

The CRA business numbers and details of your affiliated companies that are associated with the SIF-funded project should be provided in the Complex Enterprise data sheet. This group of affiliated companies that are participants on the SIF-funded project should be considered the 'reporting unit', and all data on the APBR should reflect these affiliated companies in aggregate. If all of your Canadian affiliates are associated with the project, please enter the word 'enterprise' in the top row, once in each field; no other information is needed on the table.

Return to Project and Client Data Section

Baseline data: For for-profit clients only. These data should reflect relevant information on the client for the three years prior to the beginning of the SIF-funded project. Note that data should reflect the Canadian operations of your company, in the case of multinationals.
Fiscal Year: The fiscal years for the baseline data table are generated automatically based on the project start date and the fiscal year reporting period you provided in the Project and Client Data tab.

Return to Baseline Data Sheet

Gross Business Revenues of Canadian Operations: Provide the operating revenues generated by your company's Canadian operations by each fiscal year.

R&D Definition and Guide

Gross Canadian Expenditures on R&D: Provide the R&D expenditures by your company's Canadian operations each fiscal year. Please consult the definition of R&D in the annex to this document.

Employment: Provide the number of FTEs employed in your company's Canadian operations by fiscal year.

Goods and Services Sourced from Canadian Suppliers: Dollar value of purchases from Canadian suppliers by fiscal year. Provide an estimate if needed. The figure should include all purchases, by your company's Canadian operations, of goods and services provided by Canadian suppliers (companies).

Return to Project and Client Data Section

Canadian Suppliers: Provide an estimate of the amount of goods and services purchased from all suppliers (domestic and international) in the past fiscal year. This should include purchases of contracting services, materials, M&E, capital and tooling purchases etc. and should not include items such as employee wages. Then please also provide the estimate of the amount of goods and services were purchased only from Canadian suppliers.

Return to Project and Client Data Section

Total Gross Business Revenues of Canadian Operations: Provide the revenues generated by the company's Canadian operations in the past fiscal year. Note that this figure should include revenues generated in foreign market, by Canadian operations (e.g. exports by Canadian operations).
Revenues Generated in Foreign Markets: Provide operating revenues generated by Canadian operations, from foreign markets. Include for example exports of goods, and revenues generated for services provided in foreign markets and accruing to Canadian operations. Note Gross Business Revenues of Canadian Operations (above) should include the Revenues Generated in Foreign Markets.

Return to Project and Client Data Section

Accessibility, Equity, Diversity and Inclusion: This data is collected as part of a broader SIF initiative to understand how underrepresented groups participate in the program. For more information on Accessibility, Equity, Diversity, and Inclusion initiatives at SIF, please refer to the 50-30 Challenge link below. Please answer any question for which data is available. Estimates are acceptable, however responses under this section must rely on data has been provided through self-identification.

Note: if data are not available for indicators on workforce and management composition, please enter the exact text 'not available' in your response. Note: in cases where the ownership questions are not applicable (e.g. in the case of publicly-traded companies), select 'not applicable' from the drop-down menu.

The 50 – 30 Challenge: Your Diversity Advantage

Section 2 - Benefits Data

Gross expenditures on R&D: Please provide the gross expenditures undertaken by your company's Canadian operations on R&D in the past year. Note, this should include R&D contracts where your company's Canadian operations are funding other entities to undertake R&D on its behalf, even if these other entities are not located in Canada. Note, the expenditures on R&D should include your company's current expenditures as well as capital expenditures. Do not amortize capital expenditures to calculate this figure; present them as expenses in the year in which they occurred.

Additional guidance regarding the definition of R&D is provided in the annex to this document. Note as per the instructions above, in cases where there is a variance between the APBR definition and the respondent's own accounting practices or commitments in respect of a contribution agreement, the respondent is asked to provide an explanation of the difference in the comment box.

Return to Benefits Data Section

Cost of R&D Performed in-house by your company: This category should include gross expenditures on R&D (from above) that were undertaken by the company. For example, the salaries of scientists and technicians that are employed by the company to do R&D would be included here.

Cost of R&D performed by external parties: This category should include payments made to other companies, organizations or individuals to fund R&D performance, i.e. where your company paid an external party to perform R&D on its behalf. Include grants, fellowships, and contracts. Note: If these kinds of activities were undertaken as part of the SIF-funded project, then they should also be captured under the 'collaboration' part of the questionnaire.

R&D Definition and Guide

Note: If you are a 'complex enterprise', then the APBR is being filled out for multiple affiliated companies (the 'reporting unit' as per the Project and Client Data question on Complex Enterprises). In this case, the question on R&D performed by affiliated companies should only reflect R&D funded by these companies within the reporting unit, but performed by other affiliates not otherwise associated with the SIF project. Please contact SIF for further guidance on this question.

Capital in-house R&D expenditures: Capital in-house R&D expenditures are the annual gross amount paid for the acquisition of fixed assets that are used repeatedly, or continuously in the performance of R&D for more than one year. Do not amortize capital expenditures to calculate this figure; present them as expenses in the year in which they occurred.

Return to Benefits Data Section

Capital Expenditures: Include your company's (Canadian operations) gross expenditures on fixed assets for use in the operations of your organization or for lease or rent to others. Note that this should include any capital in-house R&D expenditures. Include all costs related to the acquisition and installation of equipment or construction (including own-employee labour / installation costs etc.) Do not amortize capital expenditures to calculate this figure; present them as expenses in the year in which they occurred. Note that capital expenditures should include all expenditures on capital for use by your company's Canadian operations, including for imported assets (e.g. Machinery and Equipment).

Buildings and non-residential construction: Capital expenditures incurred during the reporting period for non-residential building and engineering construction (on a contracted basis and/or by your own employees) whether for your own use or rent to others (e.g. manufacturing plants, office buildings, processing facilities, etc.)

Machinery and Equipment: Capital expenditures incurred during the reporting period for machinery and equipment, whether for your own use or for lease or rent to others (e.g. vehicles; scientific equipment; processing machinery; computers, software, telecommunications and other information and communications technology, etc.)

Information and Communication Technology: Investment in ICT equipment should be included in the M&E total, as well as reported separately here. ICT includes computers, communications equipment, networking equipment, etc.

Other M&E: Include all other machinery and equipment investment.

Software: Capital expenditures for software should include all costs associated with the purchase of software (Pre-packaged software, Custom software developed in-house/own account, Custom software design and development, contracted out).

Clean Tech: Clean technology is defined as any process, product, or service that reduces environmental impacts through environmental protection activities, through the sustainable use of natural resources, or through the use of goods that have been specifically modified or adapted to be significantly less energy - or resource-intensive than the industry standard.

To determine if a technology is classified in the clean technology taxonomy, click here.

Return to Benefits Data Section

Employment and FTEs: Unless otherwise specified in the Client Data Section (Section 1 of the APBR), employment figures should be provided using the following definition of an FTE: "FTE or Full Time Equivalent- means each employee or, where applicable, intern, who works for the client on a full-time basis (i.e. they are responsible to work at least 2,000 hours for the Recipient when calculated on an annual basis) and, in the case of hourly paid employees or interns who are responsible to work for the client less than on a full-time basis, each equivalent to such a full-time worker, where the number of such equivalents is calculated by dividing (a) by (b) where (a) = the aggregate of all hours worked by such individuals for the client including hours taken by them as paid vacation, sick leave, and for other similar reasons, calculated on an annual basis, and (b) = 2,000 hour". Please include all paid employees in reporting and exclude employees on unpaid leave of absence.
Enterprise / Institution Wide: Provide total employment, in FTEs, at your business or institution in the past fiscal year. Provide breakdown by occupation; estimate breakdown by occupation if necessary.
On Project (total): This figure should be provided for FTE positions with your business or institution, that were employed directly on or by the project, at any phase during the project. For example, if a project is underway to set up a new production line, include FTEs that were employed in the past year to set up the new production line; after the production line is established, include FTEs that were employed on the production line in the past year. Note that on-project FTEs would be a part of total top-line employment.

On Project (New FTEs): This figure should be provided for positions that did not exist with your business or institution before the SIF-funded project, that were directly employed on the project in the last year (e.g. positions that were created with your company to work on the SIF-funded project). Employee turnover should not be counted here - for example, if an engineer who already worked with a company was assigned to work on the project, then left the company and was replaced by a new engineer in the same role, this would not be considered a 'New FTE'. Note that on-project (new FTEs) are a component of on-project (total) FTEs.

External FTEs: External FTEs includes FTEs that were directly employed by your business or institution for the project, but that did not work for the your business or institution. This would include for example sub-contracted construction workers and contractors who worked to establish a new facility but who were not your employees. This figure should not include FTEs that were employed by a partner/collaborator on the project. Note that this question is included on the APBR primarily to gather benefits data for large construction projects, where SIF clients have indicated substantial external jobs benefits or made contribution agreement commitments in respect of external jobs. Not all SIF clients are expected to provide this information.

Management: Include here middle and senior management who plan, organize, direct, control and evaluate the daily activities and future developments within the firm.

Professional occupations in natural and applied sciences: Include here scientists, engineers, etc.
Technical occupations in natural and applied sciences: Include lab technicians and support staff, etc.
Other professional occupations: Include lawyers, accountants, etc.
Trades (incl. construction) equipment operators and transport: Include construction jobs, transport and heavy equipment operation, vehicle drivers, etc.
Occupations in manufacturing and utilities: Include positions such as assemblers, processing machine operators, manufacturing or utilities labourers, etc.
Other: Include positions not fitting one of the above categories.

Highly Skilled-means an employee that requires specialized training. This may include scientists, engineers, managers and specialized trades and would typically include the employees designated as working in professional or technical occupations in natural and applied sciences or other professional occupations.

Return to Benefits Data Section

Intellectual Property and IP Protection

This section collects information about IP related to the project. The client should not report IP activities here that were not directly related to the project. This section should be completed for for-profit clients, as well as for not-for-profit clients, universities, colleges, etc.
Intellectual Property - means all inventions, whether or not patented or patentable, all commercial and technical information, whether or not constituting trade secrets, and all copyrightable works, industrial designs, integrated circuit topographies, and distinguishing marks or guises, whether or not registered or registrable.
Licensing agreements: The licensing data sheet should be completed if the client has entered into any licensing arrangements related to the SIF-funded project (licensing out IP developed under the project; licensing in needed IP for use on the project or to combine with the project IP). For the purposes of this survey, End User License Agreements (EULAs) will not be counted in license agreements.

Return to Patent Applications Data Sheet

Patent Application Data Sheet

This data sheet collects relevant information for any patents filed as a result of the SIF-funded project. Please include patent applications that were filed or patents that came into effect in the past fiscal year. Note: only patent applications directly related to the SIF-funded project (i.e. applications filed for inventions developed as part of the project) should be included here.

Project IP - If this patent consists of "project IP" as defined in your Contribution Agreement, please indicate so here.

Return to Licensing Data Sheet

Licensing Data Sheet:

Note: Only licensing arrangements that are a core component of the SIF project need to be included here. These would include, for example, out-licensing of IP developed through the SIF project and attributable to the SIF funding; or in-licensing of IP required for the SIF project to take place. For the purposes of this survey, End User License Agreements (EULAs) will not be counted in license agreements.

- Unique Identifier: Provide a unique ID for the licensing agreement. This should be a number or name that is specific to this agreement, that remains the same from year to year for multi-year agreements. It could be, for example, a contract number from your financial system, or a number assigned to represent the agreement for this exercise.
- Partner name, address information: Provide the operating name and address information for the partner (licensor or licensee) with which your company signed the licensing agreement.
- Partner Relationship to Client: Select the organizational relationship of the partner to the client. If no such relationship exists, select "No organizational relationship".
- Direction of Licensing: Select "In-license" if your company is licensing IP from the partner (i.e. your company is the licensee); select "Out-license" if your company is licensing IP to the partner (i.e. your company is the licensor). Select "In-license and out-license (cross-license)" if your company and the partner have licensed IP to each other.
- Main Purpose for Licensing: Select whether the license is an in-license (to obtain rights to Background IP or to combine with Project IP), a non-exclusive out-license, or an exclusive (all-purpose) out-license.
- Execution Date: Provide the date (YYYY/MM/DD) on which the licensing agreement took effect
- End Date of Licensing Agreement: Provide the end date (if known) of the licensing agreement
- Payment / Receipts: Provide a dollar figure (in CAD) for all payments or receipts related to the licensing agreement over the past fiscal year.

Return to Benefits Data Section

Innovation

This section collects information about innovation related to the project. The client should not report innovation activities here that were not directly related to the project. This section should be completed for for-profit clients, as well as for not-for-profit clients, universities, colleges, etc.

Product or service innovation is the market introduction of a new or significantly improved product or service with respect to its capabilities, user friendliness, components or sub-systems.

A process innovation is the implementation of a new or significantly improved production process, distribution method, or support activity for your goods or services.
Revenues and cost savings generated by new products, services, processes: Please report, for the past fiscal year, revenues (or % cost savings) attributable to any innovations developed (or implemented) as part of the SIF-funded project. Report on these revenues even if the innovation was developed (or implemented) in previous years. For example, if your company introduced a new product two years ago, and made $2,000,000 from sales of this new product this year, report on the $2,000,000 in sales this year. Also note that revenues should also be reported for products that are being licensed out.

For cost savings from process innovation, provide an estimate of the percentage of costs your business saved as a result of the introduction of the process innovation. For example, if costs would have been 10% higher without the introduction of the innovation, write 10 here.

Return to Benefits Data Section

Training

This section collects information about training activities undertaken at the client. On-the job training includes structured learning activities which include workshops, private lessons, and other online learning initiatives. Total training activities should be reported, as well as training directly related to the project (e.g. training on new equipment acquired as part of the project or training activities that were specifically intended to help employees advance the project).

Return to Benefits Data Section

Co-Ops

Provide information on the number of co-ops, interns, and other student work placements that began with your company in the past Fiscal Year. Please count four-month terms, i.e. count a single 8-month term as two four-month terms. In addition to providing this information for all co-ops engaged by the client in the past Fiscal Year, please also complete the co-op data sheet for any co-ops that were engaged to work directly on the SIF-funded project. Note: for the co-ops data sheet, specify the start and end date of each individual co-op placement.

Return to Co-Ops Data Sheet

Co-Ops Data Sheet: (only required for co-ops worked directly on the SIF-funded project)
Institution (college or university name): The name of the college or university from which the co-op is being brought on to work on the project.
Level: Indicate whether the placement is for a college, bachelor, or post-graduate level co-op student
Term start and end dates: Provide the start and end date of the individual co-op placement.
Field of Study: Provide the best fit for the field of study of the student from available options.
Postal Code: Provide the postal code of the institution's primary address.

Return to Benefits Data Section

Collaboration (For-profit only)

The collaboration data sheet is intended to capture collaborations undertaken by the client in the past fiscal year, other than intermediary-type support. The collaboration data sheet should not include collaboration between partners on intermediary, network and consortium projects (such as Stream 4 and Stream 5). These should instead be captured through the intermediary data sheet. Please consult the instructions on intermediary, partnership, network and consortium projects, below.

Return to Collaboration Data Sheet

Collaborations are (generally formal) agreements with a partner to further R&D, innovation, or other project activities, and should include e.g. outsourced R&D (contracts) as well as collaborations to which the client makes an in-kind contribution. Collaborations can be mutually beneficial to both parties. Note that the collaboration data sheet is not intended to capture simple contracts for the provision of goods and services. Include here any collaboration that was undertaken to advance the SIF-funded project, as well as any collaboration that was not directly related to the SIF-funded project, but where the collaboration should be counted against the client's contribution agreement commitments.

Collaboration Data Sheet:

- Unique Identifier: Provide a unique ID for the collaboration agreement. This should be a number or name that is specific to this agreement, that remains the same from year to year for multi-year agreements. It could be, for example, a contract number from your financial system, or a number assigned to represent the agreement for this exercise.
- Collaboration partner name and address information: The operating name and address information of the academic institution, research institute, for-profit company with which the client has a collaborative agreement.
- Collaboration Type: Specify if the collaboration was for R&D, other innovation-related activities not meeting the definition of R&D provided in the annex, or other collaboration type.
- Collaboration Start Date: Provide the start date of the collaboration agreement with the partner. Note: collaborations may have a start date prior to the beginning of the SIF-funded project, e.g. where there is a contribution agreement commitment to maintain a collaboration.
- Company Contribution to Collaboration in Past FY: Provide the value of the company's contribution to the collaboration in the past year. This could include, for example, payments for a research contract, and / or estimated pro-rated salaries of company employees who made in-kind contributions to the collaboration.
- Collaboration directly related to SIF-funded project: Indicate whether the collaboration was entered into specifically to advance or augment the SIF-funded project.

Return to General Guidance

Multiple Client Projects

Intermediary projects: a recipient is funded by SIF to provide services and / or flow-through funding to support projects with clients. The projects do not need to be specified at the outset.

Partnership: a recipient is funded by SIF, to undertake a specified project, in collaboration with one or more main partners.

Network and consortium projects: Include partnership and intermediary project elements; a lead recipient generally acts as an intermediary on these projects, but a substantial amount of the activity funded by SIF will include a group of core partners (main partners). The lead recipient will often be an intermediary, and provide flow-through funding and / or services to support collaborations with and between main partners, and between additional partners.

The lead recipient on multiple client projects is required to submit a completed Multiple Client Project APBR.
For partnership and network / consortium projects, the lead recipient is also responsible for providing a completed client-level APBR for all main partners on the project.
For projects where the recipient is also an intermediary, an intermediary data sheet should also be submitted to report information on the various projects and collaborations that were funded or supported by the intermediary in the past fiscal year.

A partner information sheet should be completed for all additional partners (i.e. partners other than main partners, including ultimate recipients of intermediary support) who received any flow-through funding support from SIF. This sheet should be provided every year the additional partner is active on the project.

A project data information sheet should also be submitted by each intermediary. The project data information sheet captures qualitative information about each project supported by the intermediary. The project data information sheet should include only projects that began in the reporting year in question, i.e. individual projects should only be reported in here once.

Return to Baseline Data Guide
Return to Benefits Data Guide

Definition and Inclusions / Exclusions for R&D:
Note: all definitions drawn from Statistics Canada RDCI Reporting Guide: 2020 Annual Survey of Research and Development in Canadian Industry Reporting Guide (statcan.gc.ca)

Definition:

Research and Development Definition: Creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. The same definition of research and development used by the Statistics Canada Survey of Research and Development in Canadian Industry should be used here. Some examples of borderline inclusions / exclusions are provided below:

Inclusions:

Prototypes: Include design, construction and operation of prototypes, provided that the primary objective is to make further improvements or to undertake technical testing. Exclude if the prototype is for commercial purposes.

Pilot plants: Include construction and operation of pilot plants, provided that the primary objective is to make further improvements or to undertake technical testing. Exclude if the pilot plant is intended to be operated for commercial purposes.

New computer software or significant improvements/modifications to existing computer software: Include technological or scientific advances in theoretical computer sciences; operating systems e.g., improvement in interface management, developing new operating system or converting an existing operating system to a significantly different hardware environment, programming languages, and applications if a significant technological change occurs.

Contracts: Include all contracts which require R&D. For contracts which include other work, report only the R&D costs.

Research work in the social sciences: Include if projects are employing new or significantly different modelling techniques or developing new formulae, analyzing data not previously available or applying new research techniques, development of community strategies for disease prevention, or health education.

Exclusions:

Routine analysis in the social sciences including policy-related studies, management studies and efficiency studies: Exclude analytical projects of a routine nature, with established methodologies, principles and models of the related social sciences to bear on a particular problem (e.g., commentary on the probable economic effects of a change in the tax structure, using existing economic data; use of standard techniques in applied psychology to select and classify industrial and military personnel, students, etc., and to test children with reading or other disabilities).

Consumer surveys, advertising, market research: Exclude projects of a routine nature, with established methodologies intended for commercialization of the results of R&D.

Routine quality control and testing: Exclude projects of a routine nature, with established methodologies not intended to create new knowledge, even if carried out by personnel normally engaged in R&D.

Pre-production activities such as demonstration of commercial viability, tooling up, trial production, and trouble shooting: Although R&D may be required as a result of these steps, these activities are excluded.

Prospecting, exploratory drilling, development of mines, oil or gas wells: Include only if for R&D projects concerned with new equipment or techniques in these activities, such as in-situ and tertiary recovery research.

Engineering: Exclude engineering unless it is in direct support of R&D.

Design and drawing: Exclude design and drawing unless it is in direct support of R&D.

Patent and license work: Exclude all administrative and legal work connected with patents and licenses.

Cosmetic modifications or style changes to existing products: Exclude if no significant technical improvement or modification to the existing products has occurred.

General purpose or routine data collection: Exclude projects of a routine nature, with established methodologies intended for on-going monitoring of an activity.

Routine computer programming, systems maintenance or software application: Exclude projects of a routine nature, with established methodologies intended to support on-going operations.

Routine mathematical or statistical analysis or operations analysis: Exclude projects of a routine nature, with established methodologies intended for on-going monitoring of an activity.

Activities associated with standards compliance: Exclude projects of a routine nature, with established methodologies intended to support standards compliance.

Specialized routine medical care such as routine pathology services: Exclude projects of a routine nature, with established methodologies intended for on-going monitoring of an activity.

← Return to the Project and Client Data Tab

Baseline Data Table

Need Help? Refer to the Guidance and Definitions

You have identified that this is not your organization's first time completing the APBR for project id: '812712'. If it is the organization's first time completing the APBR excersise, please return to the 'Project and Client Data tab' and revise Cell E46.

Please provide the below information for your business in the three years prior to the start of the SIF funded project

Fiscal Year Start (Automatic)	Fiscal Year End (Automatic)	Gross Business Revenues of Canadian Operations	Gross Canadian Expenditures on R&D	Employment (FTE total for Canadian operations):	Goods and services sourced from Canadian suppliers (estimate if needed)	Notes / Comments (Please note if estimates and/or different definitions of concepts were used)
January 1, 2017	*December 31, 2017*					
January 1, 2016	*December 31, 2016*					
January 1, 2015	*December 31, 2015*					

Note: the baseline data years are automatically calculated by the APBR form based on the project start date and fiscal year entered in the Project and Client Data Tab, and are intended to provide an analytical benchmark for the client's status prior to the SIF project. If you have any concerns about how these years have been selected, please contact SIF.

← Return to the Project and Client Data Tab

Project Location Table

Need Help? Refer to the Guidance and Definitions

In the table below, please list all of the location(s) where the project activities have/will be undertaken:
(most projects will only have one location/establishment)

Location name (the name of this establishment, facility, branch, work site, etc.)	Location description	Street Address	Postal Code	City	Province or Territory
Nova Scotia Power 1H Head Office	NSP corporate head office	1223 Lower Water St.	B3J 3S8	Halifax	Nova Scotia
Nova Scotia Power Control Centre	System control centre	5 Long Lake Drive	B3S 1N8	Halifax	Nova Scotia
Nova Scotia Power Lakeside Depot	Operational & Fleet Depot	25 Lakeside Park Drive	B3T 1M9	Halifax	Nova Scotia
Amherst Community Solar Garden Site	Amherst Industrial Park	Tupper Blvd	B4H 4S7	Amherst	Nova Scotia
Multiple Customer Homes across Nova Scotia	100 customer homes	Multiple			Nova Scotia
Maritime Pride Eggs	Industrial customer	50 Tantramar Crescent	B4H 0A1	Amherst	(8) Nova Scotia
Compass Minerals	Industrial customer	327 Smith Rd	B4H 3Y4	Amherst	(8) Nova Scotia
Bedford Institute of Oceanography	Industrial customer	1 Challenger Dr	B2Y 4A2	Dartmouth	(8) Nova Scotia

← Return to the Project and Client Data Tab

Complex Enterprise Data Sheet

Need Help? Refer to the Guidance and Definitions

This group of affiliated companies that are participants on the SIF-funded project should be considered the 'reporting unit', and all data on the APBR (unless otherwise specified) should reflect these affiliated companies in aggregate. Note also that in the case of multinational enterprises, data on the APBR should only be provided for these enterprises' Canadian operations.

Business Number (i.e., Canada Revenue Agency Number)	Business or Institution's legal name	Business or Institution's operating name	Street Address	Postal Code	City	Province or Territory

←Return to the Benefits Data Tab

Collaboration Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that your orginization did not engage in any collaborations directly releated to the SIF funded project in the fiscal year ending Dec 31, 2020. As a result, the Collaboration Data Sheet is not required to be completed for this year's APBR exercise. If your orgnaization was engaged in collaborations directly releated to the SIF funded project in the fiscal year ending Dec 31, 2020, please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E141 before continuing.

Please list all collaborations entered into during the fiscal year ending Dec 31, 2020. Do not include suppliers and supply arrangements.

Unique Identifier (e.g. could be a Collaboration Contract / agreement Number)	Collaboration partner name (provide institution / enterprise name, not individual)	Partner Status	Partner Country	Partner City	Partner Street Address	Partner Postal Code	Collaboration Type (Research, Other Innovation, Other)	Collaboration start date (YYYY-MM-DD)	Enterprise contribution to collaboration in the past FY (can provide estimated dollar value for in-kind contributions)	Collaboration directly related to SIF-funded project activity

←Return to the Benefits Data Tab

Co-Ops Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that no Co-Ops were hired to work directly on the SIF funded project in the fiscal year ending Dec 31, 2020. As a result, the Co-Ops Data Sheet is not required to be completed for this year's APBR exercise. If there were Co-Ops hired to work directly on the SIF funded project in the fiscal year ending Dec 31, 2020, please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E137 before continuing.

A separate row should be filled for each co-op term hired in the past fiscal year to work directly on the project.

Institution (college or university name)	Institution's Primary Postal Code	Level (college, bachelor, graduate, post-graduate)	Co-Op Term Start Date (YYYY/MM/DD)	Co-Op Term End Date (YYYY/MM/DD)	Field of Study

CI C0010788 – Smart Grid Semi-Annual Report Attachment 14 Page 17 of 18

← Return to the Benefits Data Tab

Licensing Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that there were no active licensing agreement(s) related to the SIF funded project over the fiscal year ending Dec 31, 2020. As a result, the Licensing Data Sheet is not required to be completed for this year's APBR exercise. If there were active licensing licensing agreements related to the SIF funded project, please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E96

Note: Only licensing arrangements that are a core component of the SIF project need to be included here. These would include, for example, out-licensing of IP developed through the SIF project and attributable to the SIF funding; or in-licensing of IP required for the SIF project to take place. For the purposes of this survey, End User License Agreements (EULAs) will not be counted in license agreements.

Unique identifier (e.g. could be a Contract ID) (provided by client)	Partner Name	Partner Country	Partner City	Partner Street Address	Partner ZIP/Postal Code	Partner Relationship to Client	Direction of Licensing (In = licensing IP FROM partner; Out = licencing IP TO partner)	Main Purpose for Licensing	Execution Date of Licensing Agreement (YYYY)	End date of Licensing Agreement (YYYY)	Payment / receipts between Feb 2021 and Jan 2022

Return to the Benefits Data Tab

Patent Application Data Sheet

Need Help? Refer to the Guidance and Definitions

You have identified that there were no IP or patent applications filed in the fiscal year ending Dec 31, 2020 that were releated to the SIF funded project. As a result, the Patent Application Data Sheet is not required to be completed for this year's APBR exercise. If there were patent applications filed releated to the SIF funded project in the fiscal year ending Dec 31, 2020 , please click the 'Return to the Benefits Data tab' button and select '(1) Yes' in E84 and E86

Please list any patent applications that exist as a result of IP developed through SIF funding. Only IP relevant to the project.

Name of Patent Owner (Assignee)	Patent Owner Relationship	Patent application number (include prefixes e.g. US, CA, PCT, etc.)	Is this a Patent Cooperation Treaty filing?	Application office or country	Filing date (YYYY-MM-DD)	Earliest Priority number (include prefixes e.g. US, CA, etc.)	Earliest Priority date (YYYY-MM-DD)	Publication number (if available) (include prefixes e.g. US, CA, WO, etc.)	Title	Technology Category	Abstract or Summary of Invention (maximum 750 characters or provide hyperlink)	Status of IP	Does this patent constitute Project IP?

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Baseline Summer Charging Distribution (2021 and 2022) - Only includes Weekday charging on non-event days and non-holidays

	TOD (HE)	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00
	Avg kWh	62.52	46.32	31.45	26.17	25.03	21.05	11.80	3.32	6.17	9.32	9.35	9.78	8.83	12.60	12.19	13.13	15.78	32.46	41.31	43.13	45.55	45.35	48.15	75.27
	Total kWh	1312.87	972.67	660.37	549.61	525.55	441.97	247.80	69.68	129.65	195.75	196.27	205.36	185.49	264.57	255.98	275.71	331.33	681.62	867.47	905.67	956.61	952.39	1011.14	1580.59
on Graph ->	% Total kWh	10%	7%	5%	4%	4%	3%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	5%	6%	7%	7%	7%	7%	11%

Baseline Winter Charging Distribution (2021 and 2022) - Only includes Weekday charging on non-event days and non-holidays

	TOD (HE)	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00
	Avg kWh	48.81	32.66	24.80	21.27	21.34	17.53	11.70	9.28	7.29	9.12	10.40	10.12	11.33	10.70	10.12	12.21	20.74	37.35	42.86	46.33	44.62	41.20	41.98	61.72
	Total kWh	4685.98	3134.96	2380.64	2041.93	2048.19	1682.69	1123.45	890.97	699.48	875.35	998.60	971.24	1087.38	1026.80	971.77	1172.02	1991.39	3585.35	4114.77	4447.74	4283.21	3955.55	4030.21	5924.77
on Graph ->	% Total kWh	8%	5%	4%	4%	4%	3%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%	3%	6%	7%	8%	7%	7%	7%	10%

Request IR-10:

Solar Generation (PV) (Section 4.4, pp 44-45)

(a) Please provide supporting data for the average capacity and capacity factor for the PV installations used in the forecast.

(b) Have you calculated the impacts of PV on summer peaks over the forecast period? If so, please provide those results.

(c) Please provide the source data and calculations for the values in Figure 31.

Response IR-10:

(a) The average reported capacity is based on 2022 installation data as submitted in the 2022 Net Metering Report (M010439). The average capacity is assumed to be 8.6 kW for residential installations and 20 kW for commercial installations. The capacity factor used for the forecast is 12.5 percent.

(b) A nominal contribution of 10 percent for June and September and 15 percent for July and August, based on installed capacity, is assumed to reduce summer peaks. Further data is being collected through the Smart Grid Nova Scotia project (CI C0010778, M09985) that will help refine the impact to summer peaks.

(c) Please refer to Attachment 1.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

PV Forecast Based on 15% growth to 2030 and 10% growth from 2030-2033

Year	Cumulative Res Installs (MW)	Cumulative Res GWh	Cumulative Comm Installs (MW)	Cumulative Comm GWh	Total Cumulative GWh	Total Cumulative Capacity (MW)	Res Install Est	Comm Install Est	Total Installs
2023	19	20	2	2	23	21	2,174	94	2,268
2024	40	44	4	4	48	44	4,675	202	4,876
2025	65	71	7	7	78	71	7,550	326	7,875
2026	93	102	9	10	112	103	10,857	468	11,324
2027	126	138	13	14	152	139	14,659	631	15,290
2028	164	179	16	18	197	180	19,033	819	19,852
2029	207	227	21	23	249	228	24,062	1,035	25,097
2030	257	281	26	28	309	282	29,846	1,284	31,130
2031	311	341	32	35	376	343	36,195	1,583	37,777
2032	371	407	39	43	449	410	43,178	1,942	45,120
2033	437	479	47	52	531	485	50,860	2,372	53,233

Request IR-11:

New Technologies (Section 4.4, pp 45-47)

(a) Were projected cost declines of home batteries considered in the study? If so, please provide the assumed cost declines.

(b) Please provide the assumptions and calculations behind the values in Figure 32.

(c) Please provide any available calculations evaluating the possible use of electric thermal storage (ETS) to moderate peak load.

Response IR-11:

(a) No.

(b) Please refer to Attachment 1.

(c) No evaluation of ETS to moderate peak load was performed.

*Peak:				
Scenario	**DER**	**Estimated Peak Impact**	**Units**	**Source**
Uninfluenced by NSPI	Residential BES	-	kW/unit per year Peak impact	Assumed negligible impact
Scenario (Demand Response)	**DER**	**Estimated Incremental Peak Impact (Optimistic Case)**		**Source**
Influenced by NSPI	Residential BES	(5.00)	kW/unit per year incremental peak impact versus equivalent uninfluenced scenario	SGNS (Tesla Powerwall, 5 kW)

Residential Customer Forecast Data:

Year	Customer Count Residential Total (December 31)
2033	538,157

**Best estimates based on data available as of April 12, 2021. Still many uknowns and much uncertainty with values presented.*

Residential Customer Uptake Scenario	**50%**	**25%**	**10%**	**5%**
Year	2033	2033	2033	2033
DER Peak Impact (kW)				
Residential BES	-	-	-	-
***DER Incremental Peak Impact (DR Optimistic Case) (kW)**				
Residential BES	(1,345,391.77)	(672,695.89)	(269,078.35)	(134,539.18)

**Net Impact of DR program on peak would be summation of "DER Peak Impact (kW)" value and "DER Incremental Peak Impact (DR Optimistic Case) (kW)" value.*

	Residential Uptake			
	50%	25%	10%	5%
Battery Peak Impact - No Control (MW)	0	0	0	0
Battery Peak Impact - Optimal DR Control (MW)	(1,345)	(673)	(269)	(135)

Request IR-12:

End-Use Intensities (Section 4.4, pp. 47-50)

(a) Please provide the underlying calculations for the residential changes in baseboard heating, heat pump heating, cooling and electric water heating in Figure 33. E.g. changes in customer fractions and base use levels for each category.

(b) Please provide the underlying calculations for the small commercial changes in lighting, heating, and miscellaneous uses in Figure 34.

(c) Please provide the underlying calculations for the general commercial changes in lighting, heating, and miscellaneous uses in Figure 35.

(d) Please explain why the commercial heating intensity increases rather than declining as it has historically in Figure 33.

Response IR-12:

(a) Please refer to the 2023 Load Forecast Report Attachment 1 Residential Intensities, filed electronically, for the Residential details. Tab "Intensities" has the underlying calculations and specific end uses in scope.

(b) Please refer to the 2023 Load Forecast Report Attachment 2 Small General Intensities, filed electronically, for the Small General details. Tab "Intensity" has the underlying calculations and specific end uses in scope.

(c) Please refer to the 2023 Load Forecast Report Attachment 3 General Intensities, filed electronically, for the General commercial details. Tab "Intensity" has the underlying calculations and specific end uses in scope.

(d) The historic trend is driven by slow growth in electric heating shares combined with increased efficiency. In the forecast period electric heating shares are expected to exceed increases in efficiency, causing the overall intensity to increase.

Request IR-13:

Commercial and Industrial Growth (Section 4.4, pp 52-53)

(a) Please provide the detailed calculations behind the values presented in Figure 34.

(b) For the small and medium commercial customers, identify the components of the demand growth in Figure 34. How much is associated with heat pumps for heating, cooling?

(c) How much of the growth represents increases in number or size of customers? How many new customers are included in the forecasts each year?

Response IR-13:

(a) Assuming this should refer to Figure 36, please refer to Attachment 1. Calculations came from the following data sources:

1. C&I account representatives reporting of 2022 influenced solutions, as well as future growth numbers via customer outreach and project completions;
2. Commercial contractors reporting of heat pump installs; and
3. Customer survey responses and known future customer projects based on conversations between customers and C&I account representatives.

The growth associated within the industrial class is based on the following:

- Electrification efforts and assisting customers with reducing their dependency on fossil fuel, based on fuel switching HVAC systems, manufacturing/process upgrades or expansion to existing operations, as well as process equipment (eg: motors, pumps).

- The Key Accounts Team continues to engage with industrial customers to gain a better understanding of potential short and long-term projects.
    - The annual large customer survey details allow the Company to identify potential new growth based on customer responses.

(b) Small and medium commercial growth was removed in the 2023 forecast as it is incorporated in the E3 electrification estimates.

(c) Growth numbers are based on:

1. Expected targets based on previous years data growth numbers, combined with known projects from existing customers.
2. New accounts and project expansions contributed to 47 percent of 2022 growth:

	TOTAL
Opportunities	19
Existing Buildings	10
New Construction	9

Mass Solution	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating Only)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating and Cooling)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Cooling Only)
Rooftop Heat Pump: Gas Heat Backup	3,933.33	5,400.00	1,466.67
Rooftop Heat Pump: Electric Coil Heat Backup	6,266.67	7,733.33	1,466.67
Centralized Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
Mini Split Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
Water Source Heat Pump (Water-Air)	2,298.33	3,148.40	850.07
Variable Refrigerant Flow (VRF/VRV) System (Air-Air	1,078.02	1,476.74	398.72
NYLE Heat Pump Water Heater (Air-Water)	976.65	976.65	-

Calculator V5 - (October 26, 2018)

Old vs. new space/water heating system	Fossil Fuel Displacement or Brand New System
Is there an existing space cooling system OR were t	None

Customer Rate Class	New Solution	Nameplate Tonnage	Gross Annual GWh
R12	Centralized Heat Pump System (Air-Air)	1240	4.01512

Assumes all energy added to second block where applicable.
Assumes 50% of new solution demand coincides with existing peak demand ***(for Fossil Fuel Displacement or Brand New Systems Only).***
Assumes 100% Power Factor (1KVA = 1KW) for R12, R21, R22, R23, R25.
Talk to Business Solutions for guidance on GWh and FCR for non-HVAC solutions or large industrial HVAC solutions.

Mass Solution	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating Only)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating and Cooling)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Cooling
Rooftop Heat Pump: Gas Heat Backup	3,933.33	5,400.00	1,466.67
Rooftop Heat Pump: Electric Coil Heat Backup	6,266.67	7,733.33	1,466.67
Centralized Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
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Water Source Heat Pump (Water-Air)	2,298.33	3,148.40	850.07
Variable Refrigerant Flow (VRF/VRV) System (Air-Air	1,078.02	1,476.74	398.72
NYLE Heat Pump Water Heater (Air-Water)	976.65	976.65	-

Calculator V5 - (October 26, 2018)

Old vs. new space/water heating system	Fossil Fuel Displacement or Brand New System
Is there an existing space cooling system OR were t	None

Customer Rate Class	New Solution	Nameplate Tonnage	Gross Annual GWh
R21	Centralized Heat Pump System (Air-Air)	1240	4.01512

Assumes all energy added to second block where applicable.
Assumes 50% of new solution demand coincides with existing peak demand ***(for Fossil Fuel Displacement or Brand New Systems Only).***
Assumes 100% Power Factor (1KVA = 1KW) for R12, R21, R22, R23, R25.
Talk to Business Solutions for guidance on GWh and FCR for non-HVAC solutions or large industrial HVAC solutions.

Mass Solution	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating Only)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating and Cooling)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Cooling Only)
Rooftop Heat Pump: Gas Heat Backup	3,933.33	5,400.00	1,466.67
Rooftop Heat Pump: Electric Coil Heat Backup	6,266.67	7,733.33	1,466.67
Centralized Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
Mini Split Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
Water Source Heat Pump (Water-Air)	2,298.33	3,148.40	850.07
Variable Refrigerant Flow (VRF/VRV) System (Air-Air	1,078.02	1,476.74	398.72
NYLE Heat Pump Water Heater (Air-Water)	976.65	976.65	-

Calculator V5 - (October 26, 2018)

Old vs. new space/water heating system	Fossil Fuel Displacement or Brand New System
Is there an existing space cooling system OR were t	None

Customer Rate Class	New Solution	Nameplate Tonnage	Gross Annual GWh
R22	Centralized Heat Pump System (Air-Air)	1240	4.01512

Assumes all energy added to second block where applicable.
Assumes 50% of new solution demand coincides with existing peak demand ***(for Fossil Fuel Displacement or Brand New Systems Only).***
Assumes 100% Power Factor (1KVA = 1KW) for R12, R21, R22, R23, R25.
Talk to Business Solutions for guidance on GWh and FCR for non-HVAC solutions or large industrial HVAC solutions.

Mass Solution	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating Only)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Heating and Cooling)	Annualized kWh per Solution Nameplate Tonnage kWh/Ton (Cooling Only)
Rooftop Heat Pump: Gas Heat Backup	3,933.33	5,400.00	1,466.67
Rooftop Heat Pump: Electric Coil Heat Backup	6,266.67	7,733.33	1,466.67
Centralized Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
Mini Split Heat Pump System (Air-Air)	2,363.74	3,238.00	874.26
Water Source Heat Pump (Water-Air)	2,298.33	3,148.40	850.07
Variable Refrigerant Flow (VRF/VRV) System (Air-Air	1,078.02	1,476.74	398.72
NYLE Heat Pump Water Heater (Air-Water)	976.65	976.65	-

Calculator V5 - (October 26, 2018)

Old vs. new space/water heating system	Fossil Fuel Displacement or Brand New System
Is there an existing space cooling system OR were t	None

Customer Rate Class	New Solution	Nameplate Tonnage	Gross Annual GWh
R23	Centralized Heat Pump System (Air-Air)	620	2.00756

Assumes all energy added to second block where applicable.
Assumes 50% of new solution demand coincides with existing peak demand ***(for Fossil Fuel Displacement or Brand New Systems Only).***
Assumes 100% Power Factor (1KVA = 1KW) for R12, R21, R22, R23, R25.
Talk to Business Solutions for guidance on GWh and FCR for non-HVAC solutions or large industrial HVAC solutions.

Request IR-14:

Introduction (Section 2.0, citing to Board Decision concerning 2022 Load Forecast)

(a) How has the Company addressed in its 2023 Load Forecast the Board's directive to "evaluate the model's economic inputs, including the COVID-19 variable?" Please explain in detail.

(b) How has the Company addressed in its 2023 Load Forecast the Board's directive to "[e]xamine the elasticity used in the SAE model to exclude elasticities calculated from non-winter peaking utilities or to apply elasticities from Canadian studies of Canadian electric utilities?" Please explain in detail.

(c) How has the Company addressed in its 2023 Load Forecast the Board's directive to "Consider incorporating household size and age of household residents, to determine if a better understanding of demand on load by time of day is achieved?" Please explain in detail.

(d) For each of the bulleted updates to the load forecast listed on page 12 as being "in accordance with the Board's direction," please specifically indicate the specific directive from the Board to which each of these updates is responsive.

Response IR-14:

(a-d) Please refer to Synapse IR-45 and IR-46.

Request IR-15:

Price Data (Section 4.5, pp 52-53)

(a) Please provide the data and calculations used to produce the electricity prices shown in Figure 37.

(b) The report states: "The SAE models are estimated using a -0.15 price elasticity." Please provide supporting data for the use of this elasticity. Please also clarify whether the basis for utilization of this price elasticity value has changed in any way, given that the same value has been used in previous forecasts.

(c) Have any estimates of price elasticity been calculated specifically for Nova Scotia/Canada or for winter peaking systems? If yes, please explain in detail. If not, please explain why not.

Response IR-15:

(a) Please refer to Attachment 1.

(b) There have been studies on the price elasticity of electricity consumption, most dating from the 1980s and 1990s[1], with a range of results from -0.05 to -0.30. The elasticity of -0.15 is near the mid-range. In 1997, a study published in the Journal of Business and Economic Statistics estimated the price elasticities in 49 U.S. States (excluding Hawaii) and found variation across states. The mean of the estimates was –0.16.[2] A 2006 study prepared for

[1] Bohi, Douglas R., and Mary Beth Zimmerman, "An Update on Econometric Studies of Energy Demand Behavior," *Annual Review of Energy,* Vol. 9, 1984, pp. 105–154.

[2] Maddala, G. S, Robert P. Trost, Hongyi Li, and Frederick Joutz, "Estimation of Short-Run and Long-Run Elasticities of Energy Demand from Panel Data Using Shrinkage Estimators," Journal of Business & Economic Statistics, Vol. 15, No. 1, January 1997, pp. 90–101.

the National Energy Research Lab[3] showed that the results had not changed significantly since those earlier reports.

(c) No. Please refer to NSUARB IR-10.

[3] M.A Bernstein and J. Griffin, "Regional Differences in the Price-Elasticity of Demand for Energy", RAND Corporation Santa Monica, California for NREL, February 2006.

M11108 2023 Load Forecast Synapse IR-15 Attachment 1 has been filed electronically.

Request IR-16:

Demand Side Management (Section 4.6, pp 54-56).

(a) Please provide the source data for the DSM values used in this forecast.

(b) Please provide the DSM values used in the latest IRP.

(c) Please provide the DSM levels as presented in the latest E1 potential study.

(d) Please provide the inputs and calculations used to create Figure 38.

(e) Please identify any changes to the forecast of Annual DSM Savings provide in Figure 38 relative to the same forecast provided in the 2022 Load Forecast Report, and please provide a narrative explanation of any such changes.

Response IR-16:

(a) As outlined in the 2023 Load Forecast Report, the values between 2023 and 2025 are based on EOne's proposed Settlement Plan from its 2023-2025 DSM Resource Plan Filing, March 11, 2022 (M10473). Beyond 2025, the values are based on the EOne Potential Study base case values from the EOne DSM Potential Study, Exhibit N-1, August 14, 2019 (M08929).

(b-c) Please refer to the table below. The values for 2023-2025 are from EOne's supply agreement, while the values from 2026-2033 are from the base case of the EOne Potential Study referred to in part (a).

Year	Energy (GWh)	Demand (MW)
2023	120.7	26.9
2024	142.6	25.6
2025	149.5	26.4
2026	136.3	25.0
2027	137.1	25.2
2028	147.0	26.6
2029	135.1	24.5

Year	Energy (GWh)	Demand (MW)
2030	133.3	24.2
2031	130.6	23.4
2032	128.2	22.8
2033	122.3	21.6

(d) Please refer to Attachment 1, filed electronically.

(e) Figure 38 provides a separate column for estimated commercial and industrial savings, but the DSM methodology in the 2023 forecast is the same as the 2022 forecast.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Forecast Residential DSM savings (GWh)	Forecast Commercial DSM savings (GWh)	Forecast Industrial DSM savings (GWh)	DSM captured by Residential end use forecast (GWh)	DSM captured by Comm/Ind end use forecast (GWh)	DSM Adjustment for Residential with Coefficient (GWh)	DSM Adjustment for Comm/Ind with Coefficient (GWh)	Res Coefficient	Non-Res Coefficient
2023	69.3	43.7	7.7	39.8	31.0	29.5	20.4	0.425	0.397
2024	60.9	69.4	12.3	35.0	49.3	25.9	32.4	0.425	0.397
2025	65.6	71.3	12.6	37.7	50.6	27.9	33.3	0.425	0.397
2026	69.6	56.7	10	40.0	40.2	29.6	26.5	0.425	0.397
2027	71.6	55.7	9.8	41.2	39.5	30.4	26.0	0.425	0.397
2028	73	62.9	11.1	42.0	44.6	31.0	29.4	0.425	0.397
2029	73.7	52.2	9.2	42.4	37.0	31.3	24.4	0.425	0.397
2030	73.3	51	9	42.1	36.2	31.2	23.8	0.425	0.397
2031	74.1	48	8.5	42.6	34.1	31.5	22.4	0.425	0.397
2032	73.2	46.8	8.3	42.1	33.2	31.1	21.9	0.425	0.397
2033	71.3	43.4	7.7	41.0	30.8	30.3	20.3	0.425	0.397

Request IR-17:

Demand Side Management Adjustment (Section 4.6, pp 54-56)

(a) Please provide the details of the data and statistical analysis that was used to develop the coefficient for the DSM variable in the Residential SAE Model

(b) Please provide the details of the data and statistical analysis that were used to develop the coefficient for the DSM variable for the Commercial and Industrial forecast.

(c) Please describe any changes in the data and statistical analysis used to develop the coefficient for the DSM variable in the Residential SAE model relative to the data and statistical analysis used to develop coefficient for the DSM variable in the Residential SAE Model for the 2022 Load Forecast Report.

(d) Please describe any changes in the data and statistical analysis used to develop the coefficient for the DSM variable for the Commercial and Industrial forecast relative to the data and statistical analysis used to develop coefficient for the DSM variable for the Commercial and Industrial forecast for the 2022 Load Forecast Report.

(e) Please provide the statistical measures associated with the coefficients referenced in (a) and (b).

(f) Please provide the historical and forecasted annual values of DSM that are used for this forecast for each sector.

Response IR-17:

(a) Please refer to section 4.6 (Demand Side Management) of the Report for a description of the process used to develop the coefficient for the DSM variable. The model fit and model

statistics are provided in Appendix B and in 2023 Load Forecast Report Attachment 5 Residential Model, filed electronically.

(b) Please refer to section 4.6 (Demand Side Management) of the Report for a description of the process used to develop the coefficient for the DSM variable. The model fit and model statistics are provided in Appendix B. Please refer to Attachment 1, filed electronically, for the model coefficients, inputs and outputs.

(c) The methodology in the 2023 forecast is the same as the 2022 forecast for the Residential variable.

(d) The methodology used in 2023 is the same as 2022. The 2022 model used binaries for May and June 2020, while the 2023 model removed 2020 data due to the swings in billed sales related to COVID, and added a binary for October 22 to account for billing anomalies resulting from hurricane Fiona.

(e) Please refer to part (a) and (b).

(f) In the residential class, DSM amounts are in 2023 LFR Attachment 5 Residential Model, filed electronically, in column G of the Inputs tab. Commercial and industrial class amounts are in Attachment 1 in column D of the Inputs tab.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Month	NonResSales2	EESavingsProfiled	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	Bad	XMissing	YMissing
2013	1	368,026.23	21,446.63	0.00	103,122.63	149,839.49	37,577.00	0.00	0.00	0.00	0.00	0.00
2013	2	373,804.64	21,111.38	0.00	116,393.25	142,169.77	37,585.00	0.00	0.00	0.00	0.00	0.00
2013	3	334,652.19	20,743.34	0.00	100,560.93	138,978.41	37,572.00	0.00	0.00	0.00	0.00	0.00
2013	4	329,270.19	20,076.74	0.00	87,234.36	145,796.96	37,595.00	0.00	0.00	0.00	0.00	0.00
2013	5	311,866.70	18,862.94	2,563.16	63,684.97	144,696.39	37,632.00	0.00	0.00	0.00	0.00	0.00
2013	6	304,861.77	17,255.21	6,670.23	36,995.86	145,706.73	37,665.00	0.00	0.00	0.00	0.00	0.00
2013	7	304,144.38	16,907.46	64,377.27	11,375.44	144,602.85	37,688.00	0.00	0.00	0.00	0.00	0.00
2013	8	321,074.38	17,897.11	75,710.29	1,587.36	147,490.41	37,723.00	0.00	0.00	0.00	0.00	0.00
2013	9	304,646.35	19,655.06	17,132.19	6,899.43	145,697.84	37,760.00	0.00	0.00	0.00	0.00	0.00
2013	10	292,580.13	22,051.26	3,703.93	24,019.36	144,722.57	37,738.00	0.00	0.00	0.00	0.00	0.00
2013	11	303,914.04	24,566.03	0.00	51,756.09	145,826.32	37,762.00	0.00	0.00	0.00	0.00	0.00
2013	12	326,063.18	26,345.28	0.00	85,994.58	144,833.67	37,794.00	0.00	0.00	0.00	0.00	0.00
2014	1	376,803.09	27,762.07	0.00	111,686.96	146,423.87	37,783.00	0.00	0.00	0.00	0.00	0.00
2014	2	362,799.75	27,124.28	0.00	111,306.48	138,899.57	37,810.00	0.00	0.00	0.00	0.00	0.00
2014	3	343,395.73	26,458.29	0.00	106,191.58	135,904.70	37,811.00	0.00	0.00	0.00	0.00	0.00
2014	4	336,604.02	25,436.61	0.00	97,634.56	142,689.10	37,838.00	0.00	0.00	0.00	0.00	0.00
2014	5	307,013.63	23,737.99	0.00	65,753.74	141,751.82	37,870.00	0.00	0.00	0.00	0.00	0.00
2014	6	296,541.78	21,565.69	4,743.54	41,805.89	142,859.00	37,867.00	0.00	0.00	0.00	0.00	0.00
2014	7	302,159.49	20,974.71	19,692.68	13,958.87	141,907.59	37,863.00	0.00	0.00	0.00	0.00	0.00
2014	8	317,353.57	22,049.61	37,268.69	2,323.33	144,826.87	37,854.00	0.00	0.00	0.00	0.00	0.00
2014	9	294,366.91	24,058.35	34,020.86	5,924.36	143,045.73	37,874.00	0.00	0.00	0.00	0.00	0.00
2014	10	288,335.61	26,842.06	12,325.72	19,821.14	142,035.62	37,880.00	0.00	0.00	0.00	0.00	0.00
2014	11	297,943.09	29,754.56	678.94	42,533.11	143,077.03	37,883.00	0.00	0.00	0.00	0.00	0.00
2014	12	315,061.79	31,740.75	0.00	74,144.90	142,065.13	37,920.00	0.00	0.00	0.00	0.00	0.00
2015	1	365,304.14	33,236.77	0.00	98,284.96	143,769.89	37,946.00	0.00	0.00	0.00	0.00	0.00
2015	2	357,136.08	32,382.85	0.00	120,411.49	136,607.39	37,944.00	0.00	0.00	0.00	0.00	0.00
2015	3	363,316.95	31,495.77	0.00	119,484.76	133,614.37	37,970.00	0.00	0.00	0.00	0.00	0.00
2015	4	359,857.82	30,183.33	0.00	100,393.39	140,281.71	37,948.00	0.00	0.00	0.00	0.00	0.00
2015	5	311,442.92	28,062.12	0.00	66,569.20	139,379.65	37,982.00	0.00	0.00	0.00	0.00	0.00
2015	6	284,290.26	25,406.06	2,047.25	35,573.18	140,474.48	37,953.00	0.00	0.00	0.00	0.00	0.00
2015	7	308,229.86	24,630.08	14,813.27	18,273.79	139,512.36	37,977.00	0.00	0.00	0.00	0.00	0.00
2015	8	313,026.61	25,827.27	64,186.31	2,291.89	142,382.28	37,973.00	0.00	0.00	0.00	0.00	0.00
2015	9	308,109.86	28,120.60	75,529.12	2,623.61	140,721.54	38,011.00	0.00	0.00	0.00	0.00	0.00
2015	10	294,828.05	31,296.57	23,378.66	18,829.81	139,843.16	37,999.00	0.00	0.00	0.00	0.00	0.00
2015	11	295,942.79	34,612.56	0.00	49,627.96	140,999.63	38,034.00	0.00	0.00	0.00	0.00	0.00
2015	12	314,301.05	36,850.82	0.00	68,640.12	140,122.05	38,035.00	0.00	0.00	0.00	0.00	0.00
2016	1	344,337.50	38,491.19	0.00	89,089.69	142,139.73	38,060.00	0.00	0.00	0.00	0.00	0.00
2016	2	336,057.43	37,391.24	0.00	101,766.03	137,273.81	38,064.00	0.00	0.00	0.00	0.00	0.00
2016	3	331,317.47	36,279.62	0.00	92,891.39	135,390.89	38,091.00	0.00	0.00	0.00	0.00	0.00
2016	4	340,808.80	34,691.82	0.00	86,746.94	139,295.47	38,121.00	0.00	0.00	0.00	0.00	0.00
2016	5	312,283.00	32,188.60	287.17	61,890.17	138,422.93	38,129.00	0.00	0.00	0.00	0.00	0.00
2016	6	294,853.67	29,100.61	1,680.56	36,284.27	139,574.15	38,106.00	0.00	0.00	0.00	0.00	0.00
2016	7	295,485.57	28,181.08	33,467.73	16,302.65	138,748.05	38,128.00	0.00	0.00	0.00	0.00	0.00
2016	8	302,701.03	29,508.38	73,215.07	2,668.41	141,742.22	38,136.00	0.00	0.00	0.00	0.00	0.00
2016	9	312,594.81	32,086.94	58,862.39	4,146.37	140,192.51	38,185.00	0.00	0.00	0.00	0.00	0.00
2016	10	291,859.50	35,674.63	18,065.09	20,379.80	139,438.99	38,179.00	0.00	0.00	0.00	0.00	0.00
2016	11	280,478.87	39,411.23	0.00	45,498.67	140,713.16	38,221.00	0.00	0.00	0.00	0.00	0.00
2016	12	312,588.20	41,895.20	0.00	77,614.64	139,948.77	38,247.00	0.00	0.00	0.00	0.00	0.00
2017	1	363,668.11	43,754.44	0.00	106,388.84	142,145.09	38,261.00	0.00	0.00	0.00	0.00	0.00
2017	2	334,015.70	42,486.23	0.00	102,982.94	135,750.68	38,266.00	0.00	0.00	0.00	0.00	0.00
2017	3	337,163.21	41,202.20	0.00	100,492.34	133,002.32	38,286.00	0.00	0.00	0.00	0.00	0.00
2017	4	333,232.47	39,398.96	0.00	93,640.07	139,771.32	38,351.00	0.00	0.00	0.00	0.00	0.00
2017	5	299,040.86	36,565.96	89.26	59,613.16	138,951.53	38,409.00	0.00	0.00	0.00	0.00	0.00
2017	6	297,607.26	33,055.71	4,561.77	37,465.34	140,115.78	38,420.00	0.00	0.00	0.00	0.00	0.00
2017	7	295,611.12	32,012.23	23,677.60	14,194.72	139,311.61	38,470.00	0.00	0.00	0.00	0.00	0.00
2017	8	301,281.04	33,528.65	47,187.21	4,308.57	142,307.84	38,436.00	0.00	0.00	0.00	0.00	0.00
2017	9	308,376.90	36,464.37	38,462.95	4,311.60	140,688.91	38,461.00	0.00	0.00	0.00	0.00	0.00
2017	10	287,993.16	40,530.89	12,164.46	13,906.33	139,855.72	38,447.00	0.00	0.00	0.00	0.00	0.00
2017	11	289,966.02	44,753.64	1,870.32	38,803.30	141,036.37	38,484.00	0.00	0.00	0.00	0.00	0.00
2017	12	309,174.60	47,555.60	0.00	76,914.02	140,201.95	38,504.00	0.00	0.00	0.00	0.00	0.00
2018	1	359,935.60	49,746.56	0.00	104,575.48	141,977.22	38,527.00	0.00	0.00	0.00	0.00	0.00
2018	2	374,966.70	48,380.59	0.00	102,859.47	134,938.76	38,537.00	1.00	0.00	0.00	0.00	0.00
2018	3	325,912.30	46,996.96	0.00	87,956.86	132,141.60	38,547.00	0.00	0.00	0.00	0.00	0.00
2018	4	336,663.72	45,000.18	0.00	84,573.33	138,849.97	38,603.00	0.00	0.00	0.00	0.00	0.00
2018	5	304,392.72	41,822.74	0.00	61,359.77	138,047.75	38,648.00	0.00	0.00	0.00	0.00	0.00
2018	6	289,938.19	37,867.21	3,117.07	35,509.18	139,267.21	38,683.00	0.00	0.00	0.00	0.00	0.00
2018	7	300,750.87	36,725.01	46,906.02	17,688.09	138,459.43	38,669.00	0.00	0.00	0.00	0.00	0.00
2018	8	317,028.80	38,504.85	110,210.75	1,758.29	141,491.63	38,675.00	0.00	0.00	0.00	0.00	0.00
2018	9	304,731.14	41,909.79	84,792.46	3,562.57	140,082.22	38,683.00	0.00	0.00	0.00	0.00	0.00
2018	10	288,001.88	46,624.38	18,091.47	22,457.94	139,450.65	38,723.00	0.00	0.00	0.00	0.00	0.00
2018	11	296,321.92	51,528.84	0.00	56,001.12	140,811.49	38,739.00	0.00	0.00	0.00	0.00	0.00
2018	12	325,431.41	54,825.48	0.00	87,444.47	140,173.58	38,773.00	0.00	0.00	0.00	0.00	0.00
2019	1	373,071.51	57,266.26	0.00	112,180.64	142,159.89	38,806.00	0.00	0.00	0.00	0.00	0.00
2019	2	352,964.42	55,508.64	0.00	113,712.53	135,331.90	38,813.00	0.00	0.00	0.00	0.00	0.00
2019	3	355,810.95	53,744.36	0.00	108,482.34	132,702.32	38,809.00	0.00	0.00	0.00	0.00	0.00

Year	Month	NonResSales2	EESavingsProfiled	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	Bad	XMissing	YMissing
2019	4	319,864.16	51,305.00	0.00	91,701.92	139,620.89	38,828.00	0.00	0.00	0.00	0.00	0.00
2019	5	316,423.96	47,537.28	0.00	66,626.91	139,008.79	38,879.00	0.00	0.00	0.00	0.00	0.00
2019	6	300,770.21	42,898.54	908.02	46,306.04	140,368.25	38,901.00	0.00	0.00	0.00	0.00	0.00
2019	7	293,244.01	41,461.22	50,941.47	16,162.37	139,743.38	38,938.00	0.00	0.00	0.00	0.00	0.00
2019	8	309,140.59	43,327.10	96,823.18	1,666.45	142,605.55	38,965.00	0.00	0.00	0.00	0.00	0.00
2019	9	299,576.53	47,008.15	51,331.18	6,033.43	140,386.97	38,952.00	0.00	0.00	0.00	0.00	0.00
2019	10	268,631.54	52,151.12	4,909.59	24,382.58	138,942.67	38,982.00	0.00	0.00	0.00	0.00	0.00
2019	11	294,650.33	57,473.04	0.00	51,891.85	139,504.16	38,988.00	0.00	0.00	0.00	0.00	0.00
2019	12	307,913.66	60,958.86	0.00	80,551.88	138,039.68	38,981.00	0.00	0.00	0.00	0.00	0.00
2020	1	367,918.79	63,344.88	0.00	102,944.72	139,352.35	39,088.00	0.00	0.00	1.00	0.00	0.00
2020	2	352,434.01	61,252.13	0.00	106,642.26	133,856.46	39,093.00	0.00	0.00	1.00	0.00	0.00
2020	3	331,756.16	59,156.59	0.00	97,155.55	131,471.20	39,078.00	0.00	0.00	1.00	0.00	0.00
2020	4	332,867.40	56,314.47	0.00	85,939.34	134,686.06	39,055.00	0.00	0.00	1.00	0.00	0.00
2020	5	260,906.46	52,026.76	0.00	63,928.67	133,257.90	39,072.00	0.00	0.00	1.00	0.00	0.00
2020	6	247,145.20	46,817.87	9,788.63	38,232.20	133,769.05	39,070.00	0.00	0.00	1.00	0.00	0.00
2020	7	281,986.90	45,125.98	48,600.90	15,142.66	132,263.06	39,095.00	0.00	0.00	1.00	0.00	0.00
2020	8	298,247.66	47,045.20	82,421.99	3,901.68	134,832.61	39,090.00	0.00	0.00	1.00	0.00	0.00
2020	9	274,620.64	50,917.46	50,786.28	5,682.87	133,767.74	39,134.00	0.00	0.00	1.00	0.00	0.00
2020	10	274,309.70	56,334.28	6,882.49	22,324.37	133,445.89	39,110.00	0.00	0.00	1.00	0.00	0.00
2020	11	282,451.14	61,920.78	0.00	45,865.02	135,058.80	39,128.00	0.00	0.00	1.00	0.00	0.00
2020	12	289,884.50	65,535.59	0.00	65,338.78	134,772.94	39,144.00	0.00	0.00	1.00	0.00	0.00
2021	1	333,839.31	68,005.65	0.00	87,531.38	136,935.87	39,156.00	0.00	0.00	0.00	0.00	0.00
2021	2	322,634.50	65,776.88	0.00	100,863.16	130,587.87	39,189.00	0.00	0.00	0.00	0.00	0.00
2021	3	334,352.08	63,530.93	0.00	95,610.62	128,333.03	39,215.00	0.00	0.00	0.00	0.00	0.00
2021	4	331,194.61	60,485.88	0.00	83,226.99	135,298.97	39,229.00	0.00	0.00	0.00	0.00	0.00
2021	5	284,811.62	55,889.84	0.00	56,067.54	135,000.21	39,298.00	0.00	0.00	0.00	0.00	0.00
2021	6	271,951.30	50,317.44	13,006.50	35,456.09	136,649.16	39,333.00	0.00	0.00	0.00	0.00	0.00
2021	7	288,747.29	48,516.33	32,037.17	9,605.70	136,408.90	39,364.00	0.00	0.00	0.00	0.00	0.00
2021	8	298,547.50	50,582.51	68,755.64	3,499.69	139,720.99	39,361.00	0.00	0.00	0.00	0.00	0.00
2021	9	299,297.60	54,752.65	59,968.75	3,126.28	138,245.86	39,362.00	0.00	0.00	0.00	0.00	0.00
2021	10	280,936.47	60,609.73	8,792.35	15,770.12	137,547.90	39,379.00	0.00	0.00	0.00	0.00	0.00
2021	11	278,734.95	66,665.11	0.00	43,547.49	138,851.16	39,385.00	0.00	0.00	0.00	0.00	0.00
2021	12	301,583.05	70,584.73	0.00	75,021.25	138,164.23	39,455.00	0.00	0.00	0.00	0.00	0.00
2022	1	349,909.68	73,321.61	0.00	103,414.84	139,979.30	39,474.00	0.00	0.00	0.00	0.00	0.00
2022	2	348,779.30	70,948.30	0.00	113,071.12	133,089.50	39,465.00	0.00	0.00	0.00	0.00	0.00
2022	3	354,360.11	68,554.33	0.00	99,775.16	130,455.72	39,477.00	0.00	0.00	0.00	0.00	0.00
2022	4	333,482.45	65,313.70	0.00	85,979.17	137,201.84	39,501.00	0.00	0.00	0.00	0.00	0.00
2022	5	299,854.42	60,386.31	2,069.93	60,090.32	136,534.33	39,523.00	0.00	0.00	0.00	0.00	0.00
2022	6	291,911.04	54,382.04	2,554.97	35,710.32	137,835.70	39,531.00	0.00	0.00	0.00	0.00	0.00
2022	7	300,667.37	52,454.47	32,701.55	12,540.01	137,187.18	39,567.00	0.00	0.00	0.00	0.00	0.00
2022	8	296,017.58	54,729.07	94,195.09	1,212.54	140,232.52	39,578.00	0.00	0.00	0.00	0.00	0.00
2022	9	277,061.93	59,292.77	76,744.14	3,475.34	138,651.97	39,617.00	0.00	0.00	0.00	0.00	0.00
2022	10	313,826.22	65,675.38	14,236.56	17,172.51	137,836.56	39,587.00	0.00	1.00	0.00	0.00	0.00
2022	11	281,815.65	72,271.41	0.00	40,974.81	138,997.03	39,584.00	0.00	0.00	0.00	0.00	0.00
2022	12	304,667.42	76,546.78	0.00	71,324.86	138,125.51	39,587.00	0.00	0.00	0.00	0.00	0.00
2023	1		78,798.15	0	100,105.17	139,959.55	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	2		75,780.14	0	115,747.16	133,145.28	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	3		72,729.97	0	106,867.69	130,254.80	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	4		68,827.42	0	95,359.65	136,733.40	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	5		63,208.91	531.05	66,438.82	135,796.26	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	6		56,560.29	5,220.28	40,242.91	136,818.85	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	7		54,203.61	39,071.63	15,435.32	135,870.67	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	8		56,185.70	79,530.24	2,686.10	138,675.59	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	9		60,462.04	58,029.16	4,850.62	137,076.10	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	10		66,533.17	13,081.14	21,091.03	136,237.18	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	11		72,729.97	272.84	49,414.22	137,363.72	39,609.00	0.00	0.00	0.00	0.00	1.00
2023	12		76,546.78	0	80,763.15	136,516.29	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	1		78,798.15	0	108,349.90	138,497.59	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	2		75,780.14	0	118,433.95	133,776.21	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	3		72,729.97	0	110,767.77	131,959.00	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	4		68,827.42	0	96,667.83	135,760.99	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	5		63,208.91	533.72	67,389.48	134,911.75	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	6		56,560.29	5,249.42	40,841.89	136,009.75	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	7		54,203.61	39,314.48	15,673.85	135,153.83	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	8		56,185.70	80,020.08	2,729.14	137,984.22	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	9		60,462.04	58,377.25	4,926.36	136,360.09	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	10		66,533.17	13,157.14	21,416.66	135,494.43	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	11		72,729.97	274.37	50,167.87	136,585.81	39,609.00	0.00	0.00	0.00	0.00	1.00
2024	12		76,546.78	0	81,978.80	135,714.46	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	1		78,798.15	0	110,039.97	137,741.98	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	2		75,780.14	0	119,161.51	131,432.49	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	3		72,729.97	0	110,062.55	128,630.43	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	4		68,827.42	0	98,247.50	135,081.59	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	5		63,208.91	536.4	68,480.38	134,215.99	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	6		56,560.29	5,275.16	41,497.53	135,289.59	39,609.00	0.00	0.00	0.00	0.00	1.00

Year	Month	NonResSales2	EESavingsProfiled	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	Bad	XMissing	YMissing
2025	7		54,203.61	39,502.48	15,923.56	134,420.50	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	8		56,185.70	80,385.93	2,772.16	137,206.69	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	9		60,462.04	58,630.64	5,001.09	135,544.82	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	10		66,533.17	13,210.58	21,735.74	134,637.40	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	11		72,729.97	275.39	50,900.48	135,676.47	39,609.00	0.00	0.00	0.00	0.00	1.00
2025	12		76,546.78	0	83,149.40	134,764.77	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	1		78,798.15	0	111,644.13	136,730.21	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	2		75,780.14	0	121,009.16	130,448.68	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	3		72,729.97	0	111,799.15	127,703.05	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	4		68,827.42	0	99,823.22	134,143.33	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	5		63,208.91	538.71	69,597.62	133,321.04	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	6		56,560.29	5,299.23	42,185.45	134,424.68	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	7		54,203.61	39,693.91	16,191.75	133,600.34	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	8		56,185.70	80,800.67	2,819.81	136,419.61	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	9		60,462.04	58,952.46	5,091.28	134,833.61	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	10		66,533.17	13,288.33	22,136.02	133,996.84	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	11		72,729.97	277.14	51,859.84	135,096.04	39,609.00	0.00	0.00	0.00	0.00	1.00
2026	12		76,546.78	0	84,757.25	134,257.35	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	1		78,798.15	0	113,569.04	136,357.90	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	2		75,780.14	0	122,599.12	130,242.70	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	3		72,729.97	0	113,258.39	127,490.17	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	4		68,827.42	0	101,118.30	133,908.95	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	5		63,208.91	543	70,494.79	133,076.83	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	6		56,560.29	5,341.08	42,725.90	134,167.33	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	7		54,203.61	40,004.09	16,397.95	133,333.25	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	8		56,185.70	81,425.39	2,855.44	136,133.13	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	9		60,462.04	59,403.17	5,154.49	134,533.14	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	10		66,533.17	13,388.53	22,408.59	133,680.63	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	11		72,729.97	279.19	52,492.61	134,760.08	39,609.00	0.00	0.00	0.00	0.00	1.00
2027	12		76,546.78	0	85,781.00	133,906.01	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	1		78,798.15	0	115,319.53	135,886.85	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	2		75,780.14	0	126,510.85	131,325.55	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	3		72,729.97	0	118,307.34	129,525.57	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	4		68,827.42	0	103,237.91	133,244.60	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	5		63,208.91	546.77	71,963.45	132,399.57	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	6		56,560.29	5,377.53	43,610.94	133,467.99	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	7		54,203.61	40,272.14	16,735.74	132,621.33	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	8		56,185.70	81,973.74	2,913.97	135,400.78	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	9		60,462.04	59,806.74	5,260.92	133,821.24	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	10		66,533.17	13,480.46	22,872.88	132,985.37	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	11		72,729.97	281.13	53,584.32	134,071.01	39,609.00	0.00	0.00	0.00	0.00	1.00
2028	12		76,546.78	0	87,572.38	133,233.32	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	1		78,798.15	0	117,780.50	135,295.18	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	2		75,780.14	0	127,961.37	129,196.39	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	3		72,729.97	0	118,207.47	126,460.87	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	4		68,827.42	0	105,533.09	132,822.86	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	5		63,208.91	551.14	73,569.76	131,992.35	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	6		56,560.29	5,420.94	44,588.05	133,069.07	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	7		54,203.61	40,600.78	17,112.06	132,236.82	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	8		56,185.70	82,644.12	2,979.74	135,015.97	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	9		60,462.04	60,296.29	5,379.77	133,442.45	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	10		66,533.17	13,590.93	23,389.81	132,610.45	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	11		72,729.97	283.44	54,795.85	133,694.45	39,609.00	0.00	0.00	0.00	0.00	1.00
2029	12		76,546.78	0	89,553.28	132,860.57	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	1		78,798.15	0	121,045.22	134,574.48	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	2		75,780.14	0	132,613.52	127,989.58	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	3		72,729.97	0	122,506.39	125,281.07	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	4		68,827.42	0	109,372.17	131,585.06	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	5		63,208.91	555.6	76,246.88	130,763.70	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	6		56,560.29	5,464.86	46,211.01	131,831.74	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	7		54,203.61	40,930.16	17,735.08	131,008.61	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	8		56,185.70	83,314.89	3,088.26	133,763.07	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	9		60,462.04	60,785.83	5,575.74	132,204.65	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	10		66,533.17	13,701.31	24,241.89	131,380.86	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	11		72,729.97	285.74	56,792.24	132,455.38	39,609.00	0.00	0.00	0.00	0.00	1.00
2030	12		76,546.78	0	92,816.39	131,629.82	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	1		78,798.15	0	125,500.93	133,416.49	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	2		75,780.14	0	137,577.34	127,022.39	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	3		72,729.97	0	127,092.35	124,334.82	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	4		68,827.42	0	113,466.90	130,591.73	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	5		63,208.91	560.34	79,101.79	129,777.15	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	6		56,560.29	5,511.49	47,941.47	130,837.67	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	7		54,203.61	41,279.50	18,399.28	130,021.29	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	8		56,185.70	84,026.59	3,203.93	132,755.90	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	9		60,462.04	61,305.59	5,784.71	131,210.85	39,609.00	0.00	0.00	0.00	0.00	1.00

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Month	NonResSales2	EESavingsProfiled	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	Bad	XMissing	YMissing
2031	10		66,533.17	13,818.61	25,150.68	130,394.92	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	11		72,729.97	288.19	58,921.91	131,462.97	39,609.00	0.00	0.00	0.00	0.00	1.00
2031	12		76,546.78	0	96,298.04	130,645.20	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	1		78,798.15	0	130,161.40	132,513.32	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	2		75,780.14	0	144,091.49	127,957.65	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	3		72,729.97	0	134,763.69	126,218.95	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	4		68,827.42	0	117,610.99	129,857.77	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	5		63,208.91	565.4	81,991.79	129,049.38	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	6		56,560.29	5,561.36	49,693.59	130,105.54	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	7		54,203.61	41,653.60	19,071.93	129,295.38	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	8		56,185.70	84,789.76	3,321.12	132,017.43	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	9		60,462.04	61,863.75	5,996.62	130,485.27	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	10		66,533.17	13,944.80	26,072.73	129,678.28	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	11		72,729.97	290.84	61,083.81	130,744.76	39,609.00	0.00	0.00	0.00	0.00	1.00
2032	12		76,546.78	0	99,834.50	129,935.92	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	1		78,798.15	0	135,318.14	131,881.57	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	2		75,780.14	0	148,935.14	125,833.49	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	3		72,729.97	0	137,590.99	123,176.99	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	4		68,827.42	0	122,845.18	129,381.31	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	5		63,208.91	570.9	85,643.57	128,580.22	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	6		56,560.29	5,615.62	51,908.47	129,636.78	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	7		54,203.61	42,061.33	19,922.57	128,833.82	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	8		56,185.70	85,620.48	3,469.36	131,549.18	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	9		60,462.04	62,470.19	6,264.36	130,023.47	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	10		66,533.17	14,081.58	27,236.99	129,220.29	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	11		72,729.97	293.69	63,811.87	130,283.99	39,609.00	0.00	0.00	0.00	0.00	1.00
2033	12		76,546.78	0	104,293.94	129,478.97	39,609.00	0.00	0.00	0.00	0.00	1.00

Year	Month	Pred	ESavingsProfile	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	X-Missing
2013	1	360,568.521	-8,506.258	0.000	88,524.072	133,211.053	147,339.654	0.000	0.000	0.000
2013	2	365,306.248	-8,373.288	0.000	99,916.035	126,392.479	147,371.022	0.000	0.000	0.000
2013	3	348,973.035	-8,227.314	0.000	86,325.019	123,555.281	147,320.049	0.000	0.000	0.000
2013	4	343,949.469	-7,962.926	0.000	74,885.022	129,617.141	147,410.232	0.000	0.000	0.000
2013	5	324,806.316	-7,481.502	1,424.398	54,669.404	128,638.706	147,555.309	0.000	0.000	0.000
2013	6	305,843.099	-6,843.836	3,706.771	31,758.537	129,536.925	147,684.702	0.000	0.000	0.000
2013	7	315,165.236	-6,705.913	35,775.644	9,765.073	128,555.546	147,774.885	0.000	0.000	0.000
2013	8	315,372.608	-7,098.430	42,073.614	1,362.646	131,122.657	147,912.121	0.000	0.000	0.000
2013	9	285,233.932	-7,795.676	9,520.679	5,922.709	129,529.023	148,057.198	0.000	0.000	0.000
2013	10	290,564.255	-8,746.067	2,058.344	20,619.060	128,661.983	147,970.936	0.000	0.000	0.000
2013	11	312,394.030	-9,743.489	0.000	44,429.241	129,643.238	148,065.040	0.000	0.000	0.000
2013	12	340,322.835	-10,449.181	0.000	73,820.756	128,760.747	148,190.512	0.000	0.000	0.000
2014	1	363,186.736	-11,011.114	0.000	95,875.993	130,174.476	148,147.381	0.000	0.000	0.000
2014	2	356,529.659	-10,758.154	0.000	95,549.378	123,485.187	148,253.248	0.000	0.000	0.000
2014	3	349,744.414	-10,494.002	0.000	91,158.570	120,822.677	148,257.169	0.000	0.000	0.000
2014	4	348,941.354	-10,088.779	0.000	83,812.926	126,854.171	148,363.036	0.000	0.000	0.000
2014	5	321,539.660	-9,415.068	0.000	56,445.313	126,020.906	148,488.509	0.000	0.000	0.000
2014	6	305,452.202	-8,553.480	2,636.076	35,887.640	127,005.220	148,476.746	0.000	0.000	0.000
2014	7	289,227.749	-8,319.082	10,943.588	11,982.786	126,159.396	148,461.062	0.000	0.000	0.000
2014	8	291,140.397	-8,745.415	20,710.904	1,994.426	128,754.710	148,425.772	0.000	0.000	0.000
2014	9	290,124.990	-9,542.129	18,906.023	5,085.678	127,171.225	148,504.193	0.000	0.000	0.000
2014	10	288,019.508	-10,646.219	6,849.634	17,015.163	126,273.211	148,527.719	0.000	0.000	0.000
2014	11	300,826.357	-11,801.385	377.297	36,511.911	127,199.053	148,539.482	0.000	0.000	0.000
2014	12	326,043.431	-12,589.157	0.000	63,648.577	126,299.452	148,684.559	0.000	0.000	0.000
2015	1	347,790.262	-13,182.515	0.000	84,371.244	127,815.028	148,786.505	0.000	0.000	0.000
2015	2	360,747.652	-12,843.828	0.000	103,365.438	121,447.379	148,778.663	0.000	0.000	0.000
2015	3	357,745.034	-12,491.991	0.000	102,569.902	118,786.514	148,880.609	0.000	0.000	0.000
2015	4	347,718.045	-11,971.446	0.000	86,181.202	124,713.942	148,794.347	0.000	0.000	0.000
2015	5	318,854.863	-11,130.121	0.000	57,145.331	123,911.991	148,927.661	0.000	0.000	0.000
2015	6	295,297.562	-10,076.666	1,137.693	30,537.259	124,885.324	148,813.952	0.000	0.000	0.000
2015	7	287,088.011	-9,768.892	8,232.009	15,686.861	124,029.977	148,908.056	0.000	0.000	0.000
2015	8	302,867.024	-10,243.725	35,669.528	1,967.442	126,581.407	148,892.372	0.000	0.000	0.000
2015	9	307,218.148	-11,153.317	41,972.938	2,252.196	125,104.960	149,041.370	0.000	0.000	0.000
2015	10	290,061.526	-12,412.984	12,991.959	16,164.171	124,324.062	148,994.318	0.000	0.000	0.000
2015	11	303,357.933	-13,728.188	0.000	42,602.379	125,352.189	149,131.554	0.000	0.000	0.000
2015	12	318,014.617	-14,615.934	0.000	58,923.077	124,571.999	149,135.475	0.000	0.000	0.000
2016	1	336,810.439	-15,266.545	0.000	76,477.710	126,365.774	149,233.500	0.000	0.000	0.000
2016	2	343,818.272	-14,830.278	0.000	87,359.521	122,039.844	149,249.184	0.000	0.000	0.000
2016	3	335,072.771	-14,389.382	0.000	79,741.218	120,365.885	149,355.051	0.000	0.000	0.000
2016	4	334,016.822	-13,759.622	0.000	74,466.611	123,837.151	149,472.681	0.000	0.000	0.000
2016	5	313,086.988	-12,766.784	159.587	53,128.690	123,061.445	149,504.049	0.000	0.000	0.000
2016	6	294,038.362	-11,542.014	933.919	31,147.685	124,084.905	149,413.866	0.000	0.000	0.000
2016	7	294,266.709	-11,177.304	18,598.641	13,994.762	123,350.482	149,500.128	0.000	0.000	0.000
2016	8	306,817.758	-11,703.746	40,686.974	2,290.659	126,012.374	149,531.496	0.000	0.000	0.000
2016	9	297,902.120	-12,726.462	32,710.925	3,559.388	124,634.643	149,723.626	0.000	0.000	0.000
2016	10	287,049.244	-14,149.431	10,039.104	17,494.729	123,964.742	149,700.100	0.000	0.000	0.000
2016	11	298,388.491	-15,631.456	0.000	39,057.647	125,097.519	149,864.782	0.000	0.000	0.000
2016	12	324,395.145	-16,616.661	0.000	66,627.121	124,417.957	149,966.728	0.000	0.000	0.000
2017	1	350,365.985	-17,354.079	0.000	91,327.905	126,370.536	150,021.622	0.000	0.000	0.000
2017	2	342,280.048	-16,851.079	0.000	88,404.158	120,685.742	150,041.227	0.000	0.000	0.000
2017	3	338,286.374	-16,341.800	0.000	86,266.143	118,242.384	150,119.647	0.000	0.000	0.000
2017	4	339,392.031	-15,626.589	0.000	80,383.909	124,260.199	150,374.513	0.000	0.000	0.000
2017	5	310,853.980	-14,502.951	49.601	51,174.019	123,531.380	150,601.931	0.000	0.000	0.000
2017	6	296,797.412	-13,110.703	2,535.060	32,161.561	124,566.433	150,645.062	0.000	0.000	0.000
2017	7	287,339.111	-12,696.831	13,158.080	12,185.247	123,851.502	150,841.112	0.000	0.000	0.000
2017	8	293,846.173	-13,298.280	26,222.810	3,698.623	126,515.221	150,707.798	0.000	0.000	0.000
2017	9	286,494.926	-14,462.659	21,374.577	3,701.232	125,075.952	150,805.823	0.000	0.000	0.000
2017	10	277,708.317	-16,075.540	6,760.018	11,937.677	124,335.233	150,750.929	0.000	0.000	0.000
2017	11	292,879.949	-17,750.388	1,039.371	33,310.107	125,384.852	150,896.006	0.000	0.000	0.000
2017	12	322,781.436	-18,861.711	0.000	66,025.687	124,643.034	150,974.427	0.000	0.000	0.000
2018	1	347,326.453	-19,730.702	0.000	89,771.254	126,221.292	151,064.610	0.000	0.000	0.000
2018	2	374,966.699	-19,188.924	0.000	88,298.170	119,963.928	151,103.820	34,789.705	0.000	0.000
2018	3	325,485.317	-18,640.143	0.000	75,505.245	117,477.185	151,143.030	0.000	0.000	0.000

Year	Month	Pred	ESavingsProfile	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	X-Missing
2018	4	329,556.223	-17,848.172	0.000	72,600.702	123,441.088	151,362.606	0.000	0.000	0.000
2018	5	310,352.406	-16,587.919	0.000	52,673.375	122,727.898	151,539.051	0.000	0.000	0.000
2018	6	292,683.787	-15,019.061	1,732.214	30,482.321	123,812.026	151,676.287	0.000	0.000	0.000
2018	7	301,399.876	-14,566.036	26,066.548	15,184.078	123,093.893	151,621.393	0.000	0.000	0.000
2018	8	324,918.092	-15,271.964	61,246.161	1,509.381	125,789.596	151,644.919	0.000	0.000	0.000
2018	9	309,769.410	-16,622.447	47,120.747	3,058.231	124,536.593	151,676.287	0.000	0.000	0.000
2018	10	286,648.318	-18,492.368	10,053.766	19,278.685	123,975.109	151,833.127	0.000	0.000	0.000
2018	11	304,716.516	-20,437.597	0.000	48,073.320	125,184.930	151,895.863	0.000	0.000	0.000
2018	12	329,967.256	-21,745.125	0.000	75,065.393	124,617.812	152,029.177	0.000	0.000	0.000
2019	1	352,128.851	-22,713.199	0.000	96,299.790	126,383.690	152,158.570	0.000	0.000	0.000
2019	2	348,098.188	-22,016.084	0.000	97,614.811	120,313.443	152,186.018	0.000	0.000	0.000
2019	3	341,954.718	-21,316.327	0.000	93,125.034	117,975.677	152,170.334	0.000	0.000	0.000
2019	4	334,742.614	-20,348.816	0.000	78,720.138	124,126.460	152,244.833	0.000	0.000	0.000
2019	5	314,367.515	-18,854.448	0.000	57,194.872	123,582.287	152,444.804	0.000	0.000	0.000
2019	6	300,562.671	-17,014.607	504.603	39,750.727	124,790.882	152,531.066	0.000	0.000	0.000
2019	7	302,650.434	-16,444.532	28,309.123	13,874.345	124,235.354	152,676.143	0.000	0.000	0.000
2019	8	317,614.300	-17,184.586	53,806.442	1,430.535	126,779.898	152,782.010	0.000	0.000	0.000
2019	9	292,598.973	-18,644.581	28,525.692	5,179.305	124,807.520	152,731.037	0.000	0.000	0.000
2019	10	279,346.973	-20,684.410	2,728.349	20,930.863	123,523.503	152,848.668	0.000	0.000	0.000
2019	11	298,645.438	-22,795.212	0.000	44,545.777	124,022.680	152,872.194	0.000	0.000	0.000
2019	12	320,536.252	-24,177.771	0.000	69,148.548	122,720.728	152,844.747	0.000	0.000	0.000
2020	1	340,399.236	-25,124.128	0.000	88,371.353	123,887.717	153,264.294	0.000	0.000	0.000
2020	2	339,536.993	-24,294.092	0.000	91,545.447	119,001.738	153,283.899	0.000	0.000	0.000
2020	3	330,045.040	-23,462.950	0.000	83,401.727	116,881.180	153,225.084	0.000	0.000	0.000
2020	4	324,311.812	-22,335.696	0.000	73,773.336	119,739.271	153,134.901	0.000	0.000	0.000
2020	5	305,914.683	-20,635.085	0.000	54,878.607	118,469.603	153,201.558	0.000	0.000	0.000
2020	6	291,808.216	-18,569.111	5,439.725	32,819.861	118,924.025	153,193.716	0.000	0.000	0.000
2020	7	292,986.253	-17,898.067	27,008.425	12,998.986	117,585.167	153,291.741	0.000	0.000	0.000
2020	8	303,635.195	-18,659.274	45,803.435	3,349.339	119,869.559	153,272.136	0.000	0.000	0.000
2020	9	285,273.667	-20,195.108	28,222.882	4,878.375	118,922.859	153,444.661	0.000	0.000	0.000
2020	10	272,632.484	-22,343.553	3,824.726	19,164.023	118,636.731	153,350.556	0.000	0.000	0.000
2020	11	288,304.622	-24,559.292	0.000	39,372.135	120,070.645	153,421.135	0.000	0.000	0.000
2020	12	303,396.456	-25,993.017	0.000	56,089.090	119,816.512	153,483.871	0.000	0.000	0.000
2021	1	323,437.630	-26,972.702	0.000	75,140.000	121,739.409	153,530.923	0.000	0.000	0.000
2021	2	330,251.947	-26,088.718	0.000	86,584.469	116,095.880	153,660.316	0.000	0.000	0.000
2021	3	324,731.114	-25,197.919	0.000	82,075.503	114,091.268	153,762.262	0.000	0.000	0.000
2021	4	321,556.100	-23,990.177	0.000	71,444.961	120,284.160	153,817.156	0.000	0.000	0.000
2021	5	300,069.322	-22,167.276	0.000	48,130.334	120,018.559	154,087.706	0.000	0.000	0.000
2021	6	293,417.038	-19,957.125	7,227.956	30,436.749	121,484.518	154,224.941	0.000	0.000	0.000
2021	7	282,424.172	-19,242.762	17,803.654	8,245.868	121,270.920	154,346.492	0.000	0.000	0.000
2021	8	299,700.962	-20,062.258	38,208.790	3,004.255	124,215.446	154,334.729	0.000	0.000	0.000
2021	9	291,535.899	-21,716.238	33,325.750	2,683.711	122,904.026	154,338.650	0.000	0.000	0.000
2021	10	271,073.224	-24,039.300	4,886.074	13,537.627	122,283.516	154,405.307	0.000	0.000	0.000
2021	11	288,812.662	-26,441.011	0.000	37,382.693	123,442.147	154,428.833	0.000	0.000	0.000
2021	12	313,939.996	-27,995.630	0.000	64,400.869	122,831.454	154,703.304	0.000	0.000	0.000
2022	1	338,916.667	-29,081.142	0.000	88,774.915	124,445.091	154,777.803	0.000	0.000	0.000
2022	2	341,986.779	-28,139.829	0.000	97,064.206	118,319.888	154,742.514	0.000	0.000	0.000
2022	3	329,228.127	-27,190.323	0.000	85,650.486	115,978.398	154,789.566	0.000	0.000	0.000
2022	4	324,762.051	-25,905.010	0.000	73,807.527	121,975.864	154,883.670	0.000	0.000	0.000
2022	5	305,135.615	-23,950.685	1,150.301	51,583.634	121,382.432	154,969.932	0.000	0.000	0.000
2022	6	288,046.267	-21,569.245	1,419.846	30,654.987	122,539.379	155,001.300	0.000	0.000	0.000
2022	7	285,238.201	-20,804.724	18,172.858	10,764.782	121,962.829	155,142.456	0.000	0.000	0.000
2022	8	311,535.764	-21,706.887	52,345.961	1,040.887	124,670.216	155,185.587	0.000	0.000	0.000
2022	9	300,718.111	-23,516.960	42,648.144	2,983.357	123,265.064	155,338.507	0.000	0.000	0.000
2022	10	313,826.220	-26,048.462	7,911.523	14,741.485	122,540.146	155,220.876	0.000	39,460.651	0.000
2022	11	285,290.550	-28,664.607	0.000	35,174.208	123,571.835	155,209.113	0.000	0.000	0.000
2022	12	308,885.340	-30,360.322	0.000	61,227.756	122,797.030	155,220.876	0.000	0.000	0.000
2023	1	334,415.18	-31,253.27	0	85,933.78	124,427.53	155,307.139	0.000	0.000	0.000
2023	2	342,981.78	-30,056.25	0	99,361.41	118,369.48	155,307.139	0.000	0.000	0.000
2023	3	333,999.39	-28,846.48	0	91,738.97	115,799.77	155,307.139	0.000	0.000	0.000
2023	4	331,427.97	-27,298.64	0	81,860.06	121,559.41	155,307.139	0.000	0.000	0.000
2023	5	308,291.73	-25,070.20	295.116	57,033.41	120,726.27	155,307.139	0.000	0.000	0.000
2023	6	291,956.25	-22,433.19	2,901.01	34,545.93	121,635.38	155,307.139	0.000	0.000	0.000

Year	Month	Pred	ESavingsProfile	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	X-Missing
2023	7	289,564.13	-21,498.48	21,712.83	13,250.22	120,792.42	155,307.139	0.000	0.000	0.000
2023	8	302,810.86	-22,284.62	44,196.43	2,305.85	123,286.06	155,307.139	0.000	0.000	0.000
2023	9	289,602.32	-23,980.72	32,247.88	4,163.94	121,864.07	155,307.139	0.000	0.000	0.000
2023	10	275,411.43	-26,388.68	7,269.43	18,105.28	121,118.26	155,307.139	0.000	0.000	0.000
2023	11	291,150.95	-28,846.48	151.621	42,418.89	122,119.78	155,307.139	0.000	0.000	0.000
2023	12	315,643.12	-30,360.32	0	69,329.91	121,366.39	155,307.139	0.000	0.000	0.000
2024	1	340,193.04	-31,253.27	0	93,011.35	123,127.82	155,307.139	0.000	0.000	0.000
2024	2	345,849.12	-30,056.25	0	101,667.84	118,930.40	155,307.139	0.000	0.000	0.000
2024	3	338,862.44	-28,846.48	0	95,086.93	117,314.85	155,307.139	0.000	0.000	0.000
2024	4	331,686.46	-27,298.64	0	82,983.05	120,694.91	155,307.139	0.000	0.000	0.000
2024	5	308,322.94	-25,070.20	296.598	57,849.49	119,939.92	155,307.139	0.000	0.000	0.000
2024	6	291,767.32	-22,433.19	2,917.20	35,060.11	120,916.07	155,307.139	0.000	0.000	0.000
2024	7	289,266.56	-21,498.48	21,847.79	13,454.98	120,155.13	155,307.139	0.000	0.000	0.000
2024	8	302,505.37	-22,284.62	44,468.65	2,342.79	122,671.42	155,307.139	0.000	0.000	0.000
2024	9	289,224.22	-23,980.72	32,441.32	4,228.96	121,227.52	155,307.139	0.000	0.000	0.000
2024	10	275,072.87	-26,388.68	7,311.67	18,384.81	120,457.94	155,307.139	0.000	0.000	0.000
2024	11	291,107.18	-28,846.48	152.47	43,065.86	121,428.20	155,307.139	0.000	0.000	0.000
2024	12	315,973.83	-30,360.32	0	70,373.47	120,653.54	155,307.139	0.000	0.000	0.000
2025	1	340,972.09	-31,253.27	0	94,462.16	122,456.06	155,307.139	0.000	0.000	0.000
2025	2	344,390.06	-30,056.25	0	102,292.41	116,846.76	155,307.139	0.000	0.000	0.000
2025	3	335,297.87	-28,846.48	0	94,481.54	114,355.67	155,307.139	0.000	0.000	0.000
2025	4	332,438.51	-27,298.64	0	84,339.09	120,090.91	155,307.139	0.000	0.000	0.000
2025	5	308,642.35	-25,070.20	298.088	58,785.96	119,321.37	155,307.139	0.000	0.000	0.000
2025	6	291,704.21	-22,433.19	2,931.50	35,622.93	120,275.82	155,307.139	0.000	0.000	0.000
2025	7	288,933.44	-21,498.48	21,952.26	13,669.34	119,503.18	155,307.139	0.000	0.000	0.000
2025	8	302,054.37	-22,284.62	44,671.96	2,379.72	121,980.17	155,307.139	0.000	0.000	0.000
2025	9	288,704.39	-23,980.72	32,582.14	4,293.11	120,502.73	155,307.139	0.000	0.000	0.000
2025	10	274,614.55	-26,388.68	7,341.36	18,658.72	119,696.01	155,307.139	0.000	0.000	0.000
2025	11	290,928.22	-28,846.48	153.038	43,694.75	120,619.77	155,307.139	0.000	0.000	0.000
2025	12	316,134.42	-30,360.32	0	71,378.36	119,809.24	155,307.139	0.000	0.000	0.000
2026	1	341,449.67	-31,253.27	0	95,839.23	121,556.57	155,307.139	0.000	0.000	0.000
2026	2	345,101.51	-30,056.25	0	103,878.49	115,972.14	155,307.139	0.000	0.000	0.000
2026	3	335,964.16	-28,846.48	0	95,972.30	113,531.20	155,307.139	0.000	0.000	0.000
2026	4	332,957.02	-27,298.64	0	85,691.75	119,256.77	155,307.139	0.000	0.000	0.000
2026	5	308,807.08	-25,070.20	299.371	59,745.04	118,525.73	155,307.139	0.000	0.000	0.000
2026	6	291,539.20	-22,433.19	2,944.88	36,213.47	119,506.90	155,307.139	0.000	0.000	0.000
2026	7	288,540.91	-21,498.48	22,058.64	13,899.56	118,774.04	155,307.139	0.000	0.000	0.000
2026	8	301,626.02	-22,284.62	44,902.43	2,420.62	121,280.44	155,307.139	0.000	0.000	0.000
2026	9	288,328.38	-23,980.72	32,760.98	4,370.53	119,870.45	155,307.139	0.000	0.000	0.000
2026	10	274,431.91	-26,388.68	7,384.57	19,002.33	119,126.54	155,307.139	0.000	0.000	0.000
2026	11	291,236.72	-28,846.48	154.011	44,518.30	120,103.75	155,307.139	0.000	0.000	0.000
2026	12	317,063.55	-30,360.32	0	72,758.59	119,358.14	155,307.139	0.000	0.000	0.000
2027	1	342,771.09	-31,253.27	0	97,491.64	121,225.58	155,307.139	0.000	0.000	0.000
2027	2	346,283.27	-30,056.25	0	105,243.37	115,789.01	155,307.139	0.000	0.000	0.000
2027	3	337,027.57	-28,846.48	0	97,224.97	113,341.95	155,307.139	0.000	0.000	0.000
2027	4	333,860.39	-27,298.64	0	86,803.49	119,048.40	155,307.139	0.000	0.000	0.000
2027	5	309,362.51	-25,070.20	301.758	60,515.19	118,308.62	155,307.139	0.000	0.000	0.000
2027	6	291,797.60	-22,433.19	2,968.14	36,677.41	119,278.11	155,307.139	0.000	0.000	0.000
2027	7	288,652.84	-21,498.48	22,231.02	14,076.58	118,536.59	155,307.139	0.000	0.000	0.000
2027	8	301,749.09	-22,284.62	45,249.60	2,451.21	121,025.76	155,307.139	0.000	0.000	0.000
2027	9	288,365.98	-23,980.72	33,011.44	4,424.80	119,603.32	155,307.139	0.000	0.000	0.000
2027	10	274,440.45	-26,388.68	7,440.25	19,236.32	118,845.42	155,307.139	0.000	0.000	0.000
2027	11	291,482.38	-28,846.48	155.152	45,061.50	119,805.08	155,307.139	0.000	0.000	0.000
2027	12	317,630.02	-30,360.32	0	73,637.41	119,045.79	155,307.139	0.000	0.000	0.000
2028	1	343,854.99	-31,253.27	0	98,994.32	120,806.81	155,307.139	0.000	0.000	0.000
2028	2	350,603.91	-30,056.25	0	108,601.34	116,751.69	155,307.139	0.000	0.000	0.000
2028	3	343,171.28	-28,846.48	0	101,559.16	115,151.47	155,307.139	0.000	0.000	0.000
2028	4	335,089.32	-27,298.64	0	88,623.03	118,457.78	155,307.139	0.000	0.000	0.000
2028	5	310,023.26	-25,070.20	303.851	61,775.95	117,706.53	155,307.139	0.000	0.000	0.000
2028	6	291,955.88	-22,433.19	2,988.39	37,437.16	118,656.38	155,307.139	0.000	0.000	0.000
2028	7	288,458.86	-21,498.48	22,379.98	14,366.54	117,903.68	155,307.139	0.000	0.000	0.000
2028	8	301,452.98	-22,284.62	45,554.33	2,501.45	120,374.68	155,307.139	0.000	0.000	0.000
2028	9	288,048.72	-23,980.72	33,235.72	4,516.16	118,970.43	155,307.139	0.000	0.000	0.000

Year	Month	Pred	ESavingsProfile	WtXCool	WtXHeat	WtXOther	NonResCusts	18-Feb	22-Oct	X-Missing
2028	10	274,272.00	-26,388.68	7,491.34	19,634.88	118,227.31	155,307.139	0.000	0.000	0.000
2028	11	291,808.02	-28,846.48	156.231	45,998.66	119,192.48	155,307.139	0.000	0.000	0.000
2028	12	318,569.76	-30,360.32	0	75,175.19	118,447.75	155,307.139	0.000	0.000	0.000
2029	1	345,441.56	-31,253.27	0	101,106.91	120,280.79	155,307.139	0.000	0.000	0.000
2029	2	349,956.22	-30,056.25	0	109,846.52	114,858.82	155,307.139	0.000	0.000	0.000
2029	3	340,360.96	-28,846.48	0	101,473.42	112,426.88	155,307.139	0.000	0.000	0.000
2029	4	336,684.64	-27,298.64	0	90,593.30	118,082.84	155,307.139	0.000	0.000	0.000
2029	5	311,042.57	-25,070.20	306.28	63,154.86	117,344.49	155,307.139	0.000	0.000	0.000
2029	6	292,464.14	-22,433.19	3,012.52	38,275.94	118,301.73	155,307.139	0.000	0.000	0.000
2029	7	288,622.70	-21,498.48	22,562.61	14,689.59	117,561.84	155,307.139	0.000	0.000	0.000
2029	8	301,539.87	-22,284.62	45,926.87	2,557.91	120,032.57	155,307.139	0.000	0.000	0.000
2029	9	288,086.04	-23,980.72	33,507.77	4,618.19	118,633.67	155,307.139	0.000	0.000	0.000
2029	10	274,443.83	-26,388.68	7,552.73	20,078.64	117,894.00	155,307.139	0.000	0.000	0.000
2029	11	292,514.55	-28,846.48	157.513	47,038.67	118,857.71	155,307.139	0.000	0.000	0.000
2029	12	319,938.84	-30,360.32	0	76,875.67	118,116.36	155,307.139	0.000	0.000	0.000
2030	1	347,603.39	-31,253.27	0	103,909.45	119,640.07	155,307.139	0.000	0.000	0.000
2030	2	352,876.91	-30,056.25	0	113,840.09	113,785.93	155,307.139	0.000	0.000	0.000
2030	3	343,002.44	-28,846.48	0	105,163.77	111,378.00	155,307.139	0.000	0.000	0.000
2030	4	338,879.81	-27,298.64	0	93,888.90	116,982.41	155,307.139	0.000	0.000	0.000
2030	5	312,250.88	-25,070.20	308.759	65,452.99	116,252.20	155,307.139	0.000	0.000	0.000
2030	6	292,781.73	-22,433.19	3,036.93	39,669.15	117,201.71	155,307.139	0.000	0.000	0.000
2030	7	288,248.66	-21,498.48	22,745.65	15,224.42	116,469.93	155,307.139	0.000	0.000	0.000
2030	8	300,891.93	-22,284.62	46,299.63	2,651.07	118,918.71	155,307.139	0.000	0.000	0.000
2030	9	287,425.88	-23,980.72	33,779.82	4,786.41	117,533.24	155,307.139	0.000	0.000	0.000
2030	10	274,143.49	-26,388.68	7,614.07	20,810.09	116,800.87	155,307.139	0.000	0.000	0.000
2030	11	293,128.04	-28,846.48	158.793	48,752.45	117,756.14	155,307.139	0.000	0.000	0.000
2030	12	321,645.85	-30,360.32	0	79,676.83	117,022.20	155,307.139	0.000	0.000	0.000
2031	1	350,398.85	-31,253.27	0	107,734.39	118,610.59	155,307.139	0.000	0.000	0.000
2031	2	356,278.17	-30,056.25	0	118,101.20	112,926.08	155,307.139	0.000	0.000	0.000
2031	3	346,097.94	-28,846.48	0	109,100.52	110,536.76	155,307.139	0.000	0.000	0.000
2031	4	341,511.77	-27,298.64	0	97,403.95	116,099.31	155,307.139	0.000	0.000	0.000
2031	5	313,827.21	-25,070.20	311.391	67,903.75	115,375.13	155,307.139	0.000	0.000	0.000
2031	6	293,409.38	-22,433.19	3,062.84	41,154.64	116,317.96	155,307.139	0.000	0.000	0.000
2031	7	288,135.21	-21,498.48	22,939.78	15,794.59	115,592.17	155,307.139	0.000	0.000	0.000
2031	8	300,491.33	-22,284.62	46,695.14	2,750.37	118,023.31	155,307.139	0.000	0.000	0.000
2031	9	287,010.60	-23,980.72	34,068.66	4,965.80	116,649.73	155,307.139	0.000	0.000	0.000
2031	10	274,112.29	-26,388.68	7,679.26	21,590.22	115,924.34	155,307.139	0.000	0.000	0.000
2031	11	294,075.30	-28,846.48	160.155	50,580.63	116,873.86	155,307.139	0.000	0.000	0.000
2031	12	323,759.27	-30,360.32	0	82,665.61	116,146.85	155,307.139	0.000	0.000	0.000
2032	1	353,596.62	-31,253.27	0	111,735.10	117,807.65	155,307.139	0.000	0.000	0.000
2032	2	362,701.61	-30,056.25	0	123,693.18	113,757.55	155,307.139	0.000	0.000	0.000
2032	3	354,358.32	-28,846.48	0	115,685.87	112,211.80	155,307.139	0.000	0.000	0.000
2032	4	344,416.69	-27,298.64	0	100,961.39	115,446.80	155,307.139	0.000	0.000	0.000
2032	5	315,663.89	-25,070.20	314.206	70,384.62	114,728.13	155,307.139	0.000	0.000	0.000
2032	6	294,290.29	-22,433.19	3,090.55	42,658.72	115,667.08	155,307.139	0.000	0.000	0.000
2032	7	288,275.18	-21,498.48	23,147.68	16,372.02	114,946.82	155,307.139	0.000	0.000	0.000
2032	8	300,359.53	-22,284.62	47,119.25	2,850.97	117,366.79	155,307.139	0.000	0.000	0.000
2032	9	286,857.64	-23,980.72	34,378.84	5,147.71	116,004.67	155,307.139	0.000	0.000	0.000
2032	10	274,336.82	-26,388.68	7,749.39	22,381.75	115,287.23	155,307.139	0.000	0.000	0.000
2032	11	295,294.12	-28,846.48	161.623	52,436.48	116,235.36	155,307.139	0.000	0.000	0.000
2032	12	326,164.52	-30,360.32	0	85,701.43	115,516.28	155,307.139	0.000	0.000	0.000
2033	1	357,461.71	-31,253.27	0	116,161.83	117,246.01	155,307.139	0.000	0.000	0.000
2033	2	364,971.14	-30,056.25	0	127,851.14	111,869.12	155,307.139	0.000	0.000	0.000
2033	3	354,080.99	-28,846.48	0	118,112.92	109,507.42	155,307.139	0.000	0.000	0.000
2033	4	348,486.32	-27,298.64	0	105,454.60	115,023.22	155,307.139	0.000	0.000	0.000
2033	5	318,384.66	-25,070.20	317.262	73,519.43	114,311.03	155,307.139	0.000	0.000	0.000
2033	6	295,805.03	-22,433.19	3,120.71	44,560.05	115,250.33	155,307.139	0.000	0.000	0.000
2033	7	288,821.64	-21,498.48	23,374.27	17,102.23	114,536.48	155,307.139	0.000	0.000	0.000
2033	8	300,532.14	-22,284.62	47,580.89	2,978.22	116,950.50	155,307.139	0.000	0.000	0.000
2033	9	287,013.92	-23,980.72	34,715.84	5,377.55	115,594.11	155,307.139	0.000	0.000	0.000
2033	10	275,005.11	-26,388.68	7,825.40	23,381.18	114,880.07	155,307.139	0.000	0.000	0.000
2033	11	297,227.93	-28,846.48	163.209	54,778.34	115,825.72	155,307.139	0.000	0.000	0.000
2033	12	329,586.42	-30,360.32	0	89,529.57	115,110.04	155,307.139	0.000	0.000	0.000

Variable	Coefficient	StdErr	T-Stat	P-Value
MSales.EESavingsProfiled	-0.397	0.129	-3.076	0.27%
MStructGen.WtXCool	0.556	0.058	9.646	0.00%
MStructGen.WtXHeat	0.858	0.04	21.506	0.00%
MStructGen.WtXOther	0.889	0.358	2.48	1.48%
MSales.NonResCusts	3.921	1.42	2.762	0.68%
MBin.Feb18	34789.705	11116.75	3.129	0.23%
MBin.Oct22	39460.651	11280.7	3.498	0.07%

Request IR-18:

Residential Sector (Section 5)

(a) Please provide the inputs and calculations used to produce the adjustments for residential solar and new customers in the Residential sales forecast.

(b) Please provide the source data and calculations behind the results in Figure 39.

(c) The report states that "The COVID-19 impact to the Residential forecast is approximately +150 GWh in 2023 and beyond." Please confirm that this means that the modeled effect of COVID-19 in the Residential forecast is a 150 GWh increase in Residential sales, per year. If not confirmed, please explain.

(d) The report states that "The long-term impact of the COVID-19 pandemic on working habits in Nova Scotia is still unknown, but the assumption in this forecast is that there will be a certain amount of continued work-from-home load, potentially through hybrid work models." Has the Company conducted any analysis on the long-term impact of the COVID-19 pandemic, including analysis of whether the incremental sales attributable to the increase in work-from-home load is apt to decline over time? Please explain.

(e) Please provide the inputs and calculations used to create Figure 41.

(f) Please provide the inputs and calculations used to create Figure 42.

(g) Please provide the inputs and calculations used to create Figure 43.

(h) Are there any proposed regulations under consideration for improved building shell efficiency? If so, please discuss and indicate how they might affect the values in Figures 41 and 43.

(i) Please explain the basis for the assumption that home size will increase.

Response IR-18:

(a) Adjustments for solar are provided in Synapse IR-10 Attachment 1. Adjustments for new customers are provided in Attachment 1.

(b) Please refer to Attachment 1.

(c) Confirmed.

(d) No, at this point the long-term impact of changes to working habits is still unknown, the assumption in the forecast is that the present state will continue for the forecast period.

(e) The inputs and calculations are provided in 2023 LFR Attachment 01 Residential Intensities on the tab "StructuralVars" in columns P, F, D and M respectively.

(f) Please refer to Attachment 1.

(g) Please refer to Attachment 1.

(h) NS Power is not aware of specific proposed changes to building structure efficiency. Improvement in structural efficiency is assumed via the EIA forecast for building shell efficiency. If the structural efficiency were to improve, all else being equal, the heating and cooling loads would be expected to decline.

(i) Estimated floor space is calculated in 2023 LFR Attachment 01 Residential Intensities on the tab "StructuralVars" in column D. It is based on historic floor space combined with the forecast for both single family and multi unit additions.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	Cumulative New Single Family	Cumulative New Multi Family	Single Family Annual Usage (kWh)	Multi Family Annual Usage (kWh)	Structrual change index	Annual New Customer Load (GWh, before DSM)
2023	2192	3985	16000	4860	1.000	54
2024	4209	7750	16000	4860	1.005	106
2025	6078	11462	16000	4860	1.011	155
2026	7774	15024	16000	4860	1.016	201
2027	9295	18381	16000	4860	1.021	243
2028	10648	21501	16000	4860	1.025	282
2029	11851	24395	16000	4860	1.029	317
2030	12921	27082	16000	4860	1.033	350
2031	13872	29575	16000	4860	1.037	379
2032	14717	31888	16000	4860	1.041	406
2033	15468	34035	16000	4860	1.045	431

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	2020	2021	2022	2023
Forecast Sales	4540	4718	4715	4830
Residential Weather variance	-91	-141	-127	-
Non-weather variance	226	42	263	-
Actual Sales	4675	4619	4851	-
Weather-adjusted Sales	4766	4760	4978	4830

Month	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
Year	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020
Residential WN (kWh)	(5,266,193)	(16,965,041)	(13,841,090)	11,177,313	8,992,859	90,453	2,887,668	2,495,984	(1,460,450)	1,826,357	(25,505,652)
Commercial WN (kWh)	(1,027,550)	(3,310,252)	(2,700,700)	2,180,939	1,754,704	17,649	563,447	487,021	(284,966)	356,362	(4,976,713)
Other WN (kWh)	(128,444)	(413,781)	(337,588)	272,617	219,338	2,206	70,431	60,878	(35,621)	44,545	(622,089)
Losses WN	(495,759)	(1,378,875)	(1,186,583)	550,220	734,659	13,778	113,829	171,923	(165,669)	221,868	(2,569,561)

Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
(55,922,780)	(32,129,693)	(17,038,614)	(16,761,578)	(31,995,973)	(2,696,204)	253,668	(8,052,313)	4,847,955	(2,109,901)	(14,670,083)	(14,282,316)	(6,705,702)
(10,911,762)	(6,269,208)	(3,324,608)	(3,270,552)	(6,243,117)	(526,089)	49,496	(1,571,183)	945,942	(411,688)	(2,862,455)	(2,786,793)	(1,308,430)
(1,363,970)	(783,651)	(415,576)	(408,819)	(780,390)	(65,761)	6,187	(196,398)	118,243	(51,461)	(357,807)	(348,349)	(163,554)
(5,313,387)	(2,549,902)	(2,010,910)	(1,488,663)	(1,939,721)	(160,649)	18,439	(552,651)	373,767	(171,660)	(1,434,776)	(1,595,058)	(617,874)

Jan-22 2022	Feb-22 2022	Mar-22 2022	Apr-22 2022	May-22 2022	Jun-22 2022	Jul-22 2022	Aug-22 2022	Sep-22 2022	Oct-22 2022	Nov-22 2022	Dec-22 2022
5,611,240	(11,078,660)	(24,971,916)	(15,762,297)	(3,756,692)	(4,204,344)	753,229	7,030,072	(349,445)	(20,484,367)	(22,710,145)	(37,436,775)
1,094,876	(2,161,690)	(4,872,569)	(3,075,570)	(733,013)	(820,360)	146,972	1,371,721	(68,184)	(3,996,950)	(4,431,248)	(7,304,737)
136,860	(270,211)	(609,071)	(384,446)	(91,627)	(102,545)	18,371	171,465	(8,523)	(499,619)	(553,906)	(913,092)
638,129	(1,106,174)	(1,431,105)	(897,658)	(223,458)	(245,492)	31,532	575,672	(34,721)	(1,291,198)	(2,035,725)	(4,037,108)

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	Model GWh	New Customers	Solar	EV	RTR	DSM Total	DSM included	DSM additional	Total Res Sales
2023	4834	54	-39	7	0	-62	-36	-27	4830
2024	4853	106	-62	15	-14	-117	-67	-50	4847
2025	4839	155	-90	31	-14	-176	-101	-75	4846
2026	4873	201	-117	60	-14	-239	-137	-102	4901
2027	4905	243	-152	101	-14	-303	-174	-129	4954
2028	4955	282	-191	160	-14	-369	-212	-157	5035
2029	4963	317	-237	244	-14	-435	-250	-185	5088
2030	4987	350	-290	333	-14	-501	-288	-213	5153
2031	5011	379	-348	433	-14	-568	-327	-241	5220
2032	5055	406	-413	544	-14	-634	-365	-269	5309
2033	5058	431	-485	666	-14	-698	-402	-297	5360

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Scaled heating components

Year	HP Heat (GWh)	HP Cool (GWh)	Baseboard Heat (GWh)	Water Heat (GWh)
2023	733	115	1058	690
2024	808	124	1034	708
2025	865	133	981	720
2026	931	143	927	733
2027	995	152	873	748
2028	1062	161	828	763
2029	1112	170	777	773
2030	1165	179	732	780
2031	1216	187	689	787
2032	1272	196	652	796
2033	1310	204	611	800

Existing Cu	488654
Xheat Coe	1.046
Xcool Coel	1.161
Xother Coe	0.939

Scaled to existing customers

	Xheat	Xcool	Xother	Covid	Other Variables
2023	2097	168	2545	150	-151
2024	2154	178	2524	150	-177
2025	2161	188	2490	150	-174
2026	2180	199	2490	150	-170
2027	2197	210	2494	150	-170
2028	2227	220	2505	150	-170
2029	2230	230	2501	150	-171
2030	2244	240	2501	150	-172
2031	2257	250	2502	150	-171
2032	2283	259	2510	150	-171
2033	2283	268	2505	150	-172

From Model (per customer)

	Heat Use	Cool Use	Other Use
2023	1.0505	1.11	0.98
2024	1.0466	1.12	0.98
2025	1.0335	1.13	0.97
2026	1.0295	1.15	0.97
2027	1.0256	1.18	0.97
2028	1.0265	1.18	0.98
2029	1.0171	1.19	0.97
2030	1.0132	1.21	0.97
2031	1.0101	1.22	0.97
2032	1.0125	1.23	0.98
2033	1.0044	1.24	0.97

	Xheat	Xcool	Xother	Historic EE	Covid	Other Vari	Correction	Sum of Ot	Model Avg Use
2023	4292.107	343.711	5208.918	-596.002	307.596	238.782	-49	-308	9843.91
2024	4408.977	363.541	5165.907	-596.002	307.596	240.696	7	-363	9883.31
2025	4423.311	384.89	5095.5	-596.002	307.596	240.696	0	-356	9855.61
2026	4461.509	406.928	5095.963	-596.002	307.596	240.696	-7	-348	9924.1
2027	4496.61	428.776	5104.798	-596.002	307.596	240.696	-7	-349	9989.15
2028	4557.943	449.823	5126.174	-596.002	307.596	240.696	-7	-348	10093.39
2029	4563.168	470.57	5117.247	-596.002	307.596	240.696	-6	-350	10109.01
2030	4591.323	490.714	5118.888	-596.002	307.596	240.696	-4	-351	10157.51
2031	4619.328	510.637	5119.95	-596.002	307.596	240.696	-5	-351	10206.77
2032	4672.15	530.103	5137.132	-596.002	307.596	240.696	-5	-350	10296.55
2033	4672.196	548.928	5125.403	-596.002	307.596	240.696	-4	-351	10303.06

Intensities

	Heating	Cooling	Other	HP Heat	HP Cool	Efurn	WH	Other Hea	Other Coo	Other Other
2023	3962	265	5665	1384	182	1999	1536	579	83	4129
2024	4031	278	5626	1511	194	1935	1577	585	84	4049
2025	4098	291	5585	1639	206	1860	1615	598	85	3970
2026	4146	303	5595	1770	218	1763	1647	613	85	3947
2027	4195	316	5603	1899	230	1667	1679	629	86	3924
2028	4249	327	5613	2026	240	1580	1710	643	87	3903
2029	4292	339	5621	2140	251	1496	1738	656	88	3883
2030	4334	350	5621	2250	261	1414	1753	670	89	3868
2031	4375	360	5621	2357	270	1335	1768	683	90	3854
2032	4415	370	5622	2459	279	1261	1782	695	91	3839
2033	4449	379	5622	2552	288	1190	1797	707	91	3825

Class level components

	HP Heat	HP Cool	Efurn	WH	Other Hea	Other Coo	Other Other
2023	743	115	1073	688	311	52	1849
2024	808	123	1035	706	313	53	1811
2025	866	132	983	720	316	54	1770
2026	931	142	928	734	323	56	1760
2027	996	154	874	749	330	58	1750
2028	1063	161	829	765	337	58	1746
2029	1112	169	778	775	341	59	1731
2030	1165	179	732	781	347	61	1725
2031	1217	187	689	788	353	62	1718
2032	1273	195	652	797	360	63	1718
2033	1310	203	611	801	363	64	1706

Request IR-19:

End-Use Intensity Trends (Section 4.4)

(a) The report references critical peak pricing (CPP) and TOU rates as currently being piloted. Does the Company assume that the charging behavior of EV owners will be impacted by either of these pricing mechanisms over the forecast period? If yes, please explain what impact is assumed. If not, then please explain why not.

(b) What is the status of the CPP and TOU pilots referenced in (a)? When will these rates be deployed to all customers?

(c) Does the anticipated future deployment of CPP, TOU rates, or other novel rate designs have any impact on the load forecast? Please explain.

Response IR-19:

(a) The charging behaviour of EV owners was modeled based on the assumption that 70 percent of charging will be managed through a combination of rates (modeled as the current TOU pilot rate) and direct control of charging loads. Please refer to Section 4.4 of the Load Forecast Report.

(b) The Company intends to file a recommendation regarding future deployment of the CPP and TOU rates as part of the matter M09777 Time-Varying Pricing Tariffs Final Report on June 30, 2023.

(c) CPP and TOU are not forecast explicitly, but the forecast assumes that deployment of TVP rates will serve to meet the peak savings goals as outlined in Figure 56 (Critical Peak Pricing column).

Request IR-20:

Commercial Sector (Section 6.0).

(a) Please explain and quantify the impacts of COVID on the 2021 and 2022 loads.

(b) Please explain and quantify the ongoing effects of COVID in the commercial forecast.

(c) Please explain why the current forecast (Figure 44) remains shows an increase through 2033 whereas the previous forecast was fairly level with a final decline.

Response IR-20:

(a-b) Please refer to 2023 LFR Attachment 07 General Model, "Outputs" tab, column K. The model estimate for COVID is -64 GWh in 2021, -37 GWh in 2022, and -13 GWh in subsequent years. The ongoing impact reflects the continued negative impact to sales in mid to late 2022 when restrictions were removed, but sales did not fully rebound. The drop is likely related to ongoing changes in operating patterns of commercial customers.

c) The increase is mostly related to a shift of part of the EV load from the residential class to the commercial class, recognizing that a portion of EV charging will occur at a combination of public charging stations and at workplaces. Without the EV load, sales would decrease due to increased solar, RTR sales, and DSM. Please refer to Appendix B pages 12 and 18 for a breakdown of the components of the forecast.

Request IR-21:

Small General Service (Section 6.1).

(a) Please explain and quantify the specific reasons for the differences from the previous forecast.

(b) Please identify and quantify in detail the specific components in the forecast model that are causing the increase starting about 2027 as shown in Figure 46.

Response IR-21:

(a) The change is driven mainly by the addition of EV load to the small general class. The specific differences from 2022 can be found by comparing the model parameters found in Appendix B of both the 2022 and 2023 Load Forecast reports. EV load added 21 percent to the class load. The components that make up the regression model in 2023 also show increased growth over the 10 year period, contributing 3.9 percent growth overall in 2023 compared to 1.5 percent growth in 2022 driven mainly by the heating component, which increases by 8.8 percent over the 10 year period in 2023 compared to 7.1 percent growth in the 2022 forecast.

(b) EV load is the main contributor to the increase starting in 2027.

Request IR-22:

General Service (Section 6.2).

(a) Please explain and quantify the specific reasons for the differences from the previous forecast.

(b) Please quantity separately and explain the derivation of the effects for (1) EV loads, (2) space heating, (3) DSM programs, (4) increased efficiency. These appear to be driven by the XHeat, XCool and XOther model variables used in Appendix B. But what component changes are driving the changes in these model variables? And how do they differ from those used in the previous forecast?

(c) Please explain in detail the sales drop in 2024 related to sales shifting to the RTR participant.

(d) Please provide details of the forecast of higher solar generation effects of 50 GWh by 2033.

Response IR-22:

(a) The change is driven mainly by the addition of EV load and the transition of load in the general class to the RTR participant. Specific differences from 2022 can be found by comparing the model parameters found in Appendix B of both the 2022 and 2023 Load Forecast reports. EV load adds 11.4 percent to the class load, while RTR reduces load by 2.7 percent. DSM is a reduction of 6.8 percent compared to a reduction of 7.3 percent in the 2022 forecast. The components that make up the regression model (XHeat, XCool and XOther) also show increased growth over the 10 year period, contributing 4.3 percent compared to 2 percent in the 2022 forecast. The increase in the model is mainly due to the

increased heating component (XHeat), which contributes 5.8 percent growth over the 10 year period of the 2023 forecast compared to 4.9 percent in the 2022 forecast.

(b) EV load and DSM are discussed in part (a), and are added outside of the regression model. The changes in the underlying factors of the XHeat, XCool and XOther variables (intensity and use) are provided in Appendix B. The intensities are a function of shares and efficiencies, and are provided in 2023 LFR Attachment 03 General Intensities, on the "Intensities" tab. A summary of the differences is provided in Attachment 1. The X variable contributions will also be impacted by the regression coefficients that result from the relationship between the inputs and the sales for the historic period.

(c) The RTR participant has applied to provide 117 GWh of load to their customers, with approximately 55 percent allocated to commercial customers, which are assumed to be in the general class.

(d) The higher solar forecast in the commercial class is driven by changes to the commercial net metering program. Please refer to E1 IR-07.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	Heat Intensity 2023	Heat Intensity 2022	Cool Intensity 2023	Cool Intensity 2022	Other Intensity 2023	Other Intensity 2022
2013	49.0	49.0	26.7	26.7	125.4	125.4
2014	48.2	47.7	26.5	26.5	122.3	122.7
2015	47.1	46.5	26.4	26.4	119.8	120.7
2016	46.4	45.5	26.3	26.2	117.8	119.1
2017	45.7	44.4	26.2	26.2	116.0	117.9
2018	45.3	43.4	26.0	26.0	113.5	115.8
2019	45.0	42.5	25.9	25.9	111.1	113.7
2020	44.7	41.6	25.7	25.7	109.0	111.3
2021	44.4	40.6	25.6	25.6	106.6	109.1
2022	44.3	40.0	25.5	25.5	104.1	107.0
2023	44.4	39.5	25.3	25.3	102.1	105.3
2024	44.6	40.1	25.2	25.2	100.4	103.8
2025	44.9	40.8	25.1	25.1	98.9	102.3
2026	45.2	41.6	25.0	25.0	97.4	100.8
2027	45.3	42.5	24.9	24.9	96.1	99.6
2028	45.7	43.5	24.8	24.8	94.6	98.2
2029	46.3	44.5	24.7	24.7	93.3	97.0
2030	47.4	45.6	24.6	24.7	91.4	95.1
2031	48.6	46.7	24.5	24.6	89.7	93.4
2032	49.8	47.9	24.5	24.5	88.2	91.9
2033	51.4		24.4		86.8	

	Heat share 2023	Heat share 2022	Cool share 2023	Cool share 2022
2013	49%	49%	79%	79%
2014	49%	49%	79%	79%
2015	49%	49%	80%	80%
2016	50%	50%	80%	80%
2017	50%	50%	81%	81%
2018	51%	51%	81%	81%
2019	51%	51%	81%	81%
2020	51%	51%	82%	82%
2021	52%	52%	82%	82%
2022	52%	52%	83%	83%
2023	53%	53%	83%	83%
2024	54%	54%	83%	83%
2025	55%	55%	84%	84%
2026	57%	57%	84%	84%
2027	58%	58%	85%	85%
2028	59%	59%	85%	85%
2029	61%	61%	85%	85%
2030	62%	62%	86%	86%
2031	64%	64%	86%	86%
2032	66%	66%	87%	87%
2033	68%		87%	

	Heat efficiency 2023	Heat efficiency 2022	Cool efficiency 2023	Cool efficiency 2022
2013	1.439	1.422	3.316	3.316
2014	1.472	1.472	3.352	3.353
2015	1.517	1.518	3.386	3.387
2016	1.553	1.563	3.418	3.419
2017	1.588	1.614	3.450	3.452
2018	1.611	1.662	3.489	3.491
2019	1.634	1.711	3.527	3.529
2020	1.658	1.762	3.562	3.565
2021	1.681	1.814	3.599	3.602
2022	1.706	1.868	3.637	3.637
2023	1.730	1.924	3.675	3.675
2024	1.755	1.929	3.712	3.712
2025	1.780	1.934	3.748	3.747
2026	1.806	1.939	3.782	3.780
2027	1.847	1.944	3.815	3.811
2028	1.874	1.948	3.846	3.841
2029	1.901	1.953	3.876	3.870
2030	1.905	1.958	3.907	3.900
2031	1.906	1.959	3.936	3.929
2032	1.907	1.961	3.965	3.957
2033	1.909		3.992	

2023 Other Shares

	Vent	EWHeat	Cooking	Refrig	I.Light	Office	Misc
2013	100%	68%	28%	48%	100%	100%	100%
2014	100%	68%	28%	48%	100%	100%	100%
2015	100%	68%	28%	48%	100%	100%	100%
2016	100%	68%	27%	48%	100%	100%	100%
2017	100%	68%	27%	47%	100%	100%	100%
2018	100%	67%	27%	47%	100%	100%	100%
2019	100%	67%	27%	47%	100%	100%	100%
2020	100%	67%	27%	47%	100%	100%	100%
2021	100%	67%	27%	47%	100%	100%	100%
2022	100%	67%	26%	47%	100%	100%	100%
2023	100%	67%	26%	47%	100%	100%	100%
2024	100%	67%	26%	47%	100%	100%	100%
2025	100%	66%	26%	47%	100%	100%	100%
2026	100%	66%	26%	47%	100%	100%	100%
2027	100%	66%	26%	47%	100%	100%	100%
2028	100%	66%	26%	47%	100%	100%	100%
2029	100%	66%	25%	46%	100%	100%	100%
2030	100%	65%	25%	46%	100%	100%	100%
2031	100%	65%	25%	46%	100%	100%	100%
2032	100%	65%	25%	46%	100%	100%	100%
2033	100%	65%	25%	46%	100%	100%	100%

2022 Other Shares

	Vent	EWHeat	Cooking	Refrig	I.Light	Office	Misc
2013	100%	68%	28%	48%	100%	100%	100%
2014	100%	68%	28%	48%	100%	100%	100%
2015	100%	68%	28%	48%	100%	100%	100%
2016	100%	67%	27%	48%	100%	100%	100%
2017	100%	67%	27%	47%	100%	100%	100%
2018	100%	67%	27%	47%	100%	100%	100%
2019	100%	67%	27%	47%	100%	100%	100%
2020	100%	67%	27%	47%	100%	100%	100%
2021	100%	67%	27%	47%	100%	100%	100%
2022	100%	67%	26%	47%	100%	100%	100%
2023	100%	66%	26%	47%	100%	100%	100%
2024	100%	66%	26%	47%	100%	100%	100%
2025	100%	66%	26%	47%	100%	100%	100%
2026	100%	66%	26%	47%	100%	100%	100%
2027	100%	66%	26%	47%	100%	100%	100%
2028	100%	66%	25%	47%	100%	100%	100%
2029	100%	65%	25%	46%	100%	100%	100%
2030	100%	65%	25%	46%	100%	100%	100%
2031	100%	65%	25%	46%	100%	100%	100%
2032	100%	65%	25%	46%	100%	100%	100%
2033	100%	65%	25%	46%	100%	100%	100%

2023 Other Efficiencies

	Vent	EWHeat	Cooking	Refrig	I.Light	Office	Misc
2013	0.488	1.020	0.685	2.628	55.945	1.000	1.000
2014	0.498	1.035	0.686	2.631	58.168	1.000	1.000
2015	0.508	1.049	0.687	2.633	60.061	1.000	1.000
2016	0.517	1.063	0.689	2.634	61.610	1.000	1.000
2017	0.527	1.080	0.690	2.636	62.911	1.000	1.000
2018	0.535	1.096	0.691	2.647	65.097	1.000	1.000
2019	0.544	1.113	0.691	2.658	67.688	1.000	1.000
2020	0.554	1.128	0.692	2.678	70.986	1.000	1.000
2021	0.563	1.143	0.693	2.707	74.369	1.000	1.000
2022	0.573	1.159	0.694	2.740	77.383	1.000	1.000
2023	0.582	1.173	0.694	2.770	80.257	1.000	1.000
2024	0.590	1.186	0.695	2.797	83.040	1.000	1.000
2025	0.599	1.199	0.695	2.821	85.612	1.000	1.000
2026	0.620	1.207	0.696	2.842	87.981	1.000	1.000
2027	0.641	1.216	0.696	2.860	90.157	1.000	1.000
2028	0.662	1.225	0.696	2.877	93.009	1.000	1.000
2029	0.683	1.233	0.697	2.892	95.656	1.000	1.000
2030	0.704	1.241	0.697	2.913	100.527	1.000	1.000
2031	0.726	1.249	0.697	2.932	105.330	1.000	1.000
2032	0.747	1.257	0.698	2.949	109.990	1.000	1.000
2033	0.768	1.265	0.698	2.965	114.416	1.000	1.000

2022 Other Efficiencies

	Vent	EWHeat	Cooking	Refrig	I.Light	Office	Misc
2013	0.488	1.020	0.685	2.628	55.945	1.000	1.000
2014	0.498	1.035	0.686	2.631	58.168	1.000	1.000
2015	0.508	1.049	0.687	2.633	60.061	1.000	1.000
2016	0.517	1.063	0.689	2.634	61.610	1.000	1.000
2017	0.527	1.080	0.690	2.636	62.911	1.000	1.000
2018	0.535	1.096	0.691	2.647	65.097	1.000	1.000
2019	0.544	1.113	0.691	2.658	67.688	1.000	1.000
2020	0.554	1.128	0.692	2.678	70.972	1.000	1.000
2021	0.563	1.143	0.693	2.707	74.259	1.000	1.000
2022	0.573	1.155	0.694	2.740	77.174	1.000	1.000
2023	0.582	1.166	0.694	2.770	80.083	1.000	1.000
2024	0.591	1.177	0.695	2.797	82.884	1.000	1.000
2025	0.599	1.187	0.695	2.822	85.498	1.000	1.000
2026	0.620	1.197	0.696	2.843	87.890	1.000	1.000
2027	0.641	1.207	0.696	2.862	90.072	1.000	1.000
2028	0.662	1.216	0.696	2.879	92.733	1.000	1.000
2029	0.682	1.225	0.697	2.894	95.400	1.000	1.000
2030	0.704	1.234	0.697	2.916	100.261	1.000	1.000
2031	0.725	1.243	0.697	2.935	105.068	1.000	1.000
2032	0.746	1.252	0.698	2.953	109.730	1.000	1.000

Request IR-23:

Large General Service (Section 6.3).

(a) Please explain and quantify the specific reasons for the differences from the previous forecast.

(b) Please quantify how much of the increase is associated with expansion of institutional facilities and how much from other factors.

Response IR-23:

(a) The changes from 2022 include delays and reductions in several of the projects as well as revised estimates of the load associated with several of the projects as more information becomes available.

(b) Two hospitals, one in Halifax and one in Cape Breton, account for an estimated 20 GWh of growth, while government buildings account for an estimated 6 GWh, universities account for an estimated 5 GWh, and other customers account for 3 GWh.

Request IR-24:

Small Industrial (Section 7.1).

(a) Please explain and quantify the specific reasons for the differences from the previous forecast.

(b) Please explain why the sales forecast increases to about 2026 and remains level thereafter.

Response IR-24:

(a) The forecasts are very similar, the difference between the 2023 forecast and the 2022 forecast is only 5GWh/year by 2032. The manufacturing GDP economic indicator growth is higher in the 2023 forecast (3.1 percent per year compared to 2 percent per year in the 2022 forecast).

(b) Sales increase steadily through the forecast period in line with the economic indicator.

Request IR-25:

Medium Industrial (Section 7.2).

(a) Please explain and quantify the specific reasons for the differences from the previous forecast.

(b) Please explain and quantify the factors behind the 0.1 percent growth rate.

Response IR-25:

(a) The change in the forecast is due to a decline in the manufacturing employment indicator (0.3 percent growth over the 10 year period compared to 0.5 percent in the previous forecast), as well as a reduction of approximately 38 GWh which represents customer load that is expected to migrate to the RTR participant in 2024.

(b) The overall growth rate is -0.7 percent due to the migration of load to the RTR participant.

Request IR-26:

Other Industrial (Section 7.3).

(a) Please explain and quantify the specific reasons for the differences from the previous forecast.

(b) Of the twenty-four responses that were received from the annual survey what fraction of the sector load does that represent?

(c) What is the aggregate percentage load change from those responses?

(d) Based on past experience how reliable are the new project values given in Figure 51?

Response IR-26:

(a) An increase in forecast new projects of 19 GWh compared to the 2022 forecast is offset by a forecast decrease of 120 GWh for an existing customer.

(b) The 24 responses received from the annual survey represent approximately 75 percent of the sector load.

(c) The aggregate load change from the responses is -5.1 percent.

(d) Near term estimates generally reflect projects that are late in the planning stages, while the longer-term estimates involve projects that may still be in the conception stage and are subject to change. To reflect the higher uncertainty with longer term forecasts for new projects, recognizing that not all new projects are likely to reach completion, scaling factors are used to reduce the total amount of new load for these projects in the forecast. These vary from 10 percent to 75 percent depending on the proposed timing and likelihood of

completion. As these projects move closer to completion, the scaling factors are updated accordingly.

Request IR-27:

Municipal (Section 7.4).

(a) Please provide the total municipal loads in GWh and MW over the forecast period.

(b) What changes if any are anticipated with the municipal supply in the forecast period?

Response IR-27:

(a) The total municipal loads over the forecast period are provided in the table below.

Year	Total Estimated Load (GWh)	Load served by NS Power (GWh)	Peak (MW)
2023	197	138	43
2024	200	67	44
2025	201	67	44
2026	203	67	45
2027	205	67	45
2028	208	68	46
2029	209	68	46
2030	210	68	46
2031	212	68	47
2032	214	68	47
2033	215	68	47

(b) The load served by NS Power is expected to decrease in 2024 as the customers participating in OATT are expected to return to 100 percent third party supply.

Request IR-28:

System Losses and Unbilled Sales (Section 8).

(a) Please provide the system losses and unbilled sales for each year of the last five years.

(b) Please provide information about how system losses vary over a typical year.

(c) Please identify and discuss the reasons for any significant changes either in the historical or forecast values of the system losses or unbilled sales.

(d) How are unmetered sales represented in the forecast?

Response IR-28:

(a) Please refer to 2023 Load Forecast Report Attachment 4 - 10-Year Forecast Classes (filed electronically), tab "Annual Sales" for historic and forecast load data associated with system losses and unbilled sales.

(b) System level losses are higher in the winter months due to increased residential load.

(c) Historical annual system losses typically constitute 6 to 7 percent of net system requirement and are forecast to remain at this level going forward.

(d) Unmetered sales (consisting mainly of streetlights) are assumed to remain constant over the forecast and are included in the Commercial class.

Request IR-29:

Net System Requirement (Section 9).

(a) Please provide the source data and the calculations used to produce the values in Figure 53.

(b) Please provide the source data and the calculations used to produce the values in Figures 54 and 55.

Response IR-29:

(a) For Figure 53, please refer to 2023 Load Forecast Report Attachment 4 10-Year Forecast Classes (filed electronically), tab Graphs, cells A104 to G110.

(b) For Figure 54, please refer to 2023 Load Forecast Report Attachment 4 10-Year Forecast Classes (filed electronically), tab Graphs, cells E12 to F32 and cells A122 to G134 for Figure 55.

Request IR-30:

Peak Demand (Section 10)

(a) Please provide details about the Demand Response (DR) resources modeled in this analysis. What sectors are represented and what are the potentials in each sector?

(b) Please provide the basis for the ELCC of 48 percent that is used in the forecast.

(c) Please provide the calculations and assumptions used to produce the DR savings in Figure 56.

(d) Please explain why the demand response total declines after 2027.

(e) What period was used to calibrate the peak model? Please provide in electronic format the data used for that calibration.

(f) Please provide the sources and the derivations of the values in Figure 65. Please also provide the values for the intervening years between 2022 and 2033.

(g) Please provide further information about the Unexplained values in Figure 66.

(h) Please provide the data and calculations behind the peak share values in Figures 68 and 69 including the actual load values as well as the percentages. Please provide the same data and calculations for 2033.

Response IR-30:

(a) The requested details are contained in E1's DSM 2019 Potential Study. Please refer to Attachment 1.

(b) The basis for the ELCC of 48 percent is described in the 2023 Load Forecast Report on pages 77 and 78, as follows: "DR forecasts continue to use an effective load carrying capacity (ELCC) of 48 percent to account for the fact that the full nameplate capacity will not be available at all times, and this value will be reassessed as more information is gathered through the implementation of DR programs."

(c) Please refer to 2023 Load Forecast Report Attachment 4 - 10-year Forecast Classes (filed electronically), DR tab.

(d) EOne's DSM Potential Study states as follows page 13: "The decline in potential is associated with the decrease in baseline peak demand for DR with progressively higher savings from energy efficient measures."

(e) Please refer to Synapse IR-02 Attachment 1 for the hourly data used in the model. The calibration period for the peak model was January 2013 to December 2022. For inputs to the SAE system peak model, please refer to the 2023 Load Forecast Report Attachment 10 - Peak Model, filed electronically.

(f) Please refer to 2023 Load Forecast Report Attachment 04 - 10-Year Forecast Classes, filed electronically. Modeled Peak, Large Cust and Inter. Cust are from the tab Demand Annual Profile, EV and DR values come from their respective tabs (EV is grossed to system level using the residential loss factor of 16.3 percent), while C&I Elect comes from the Comm Growth tab (grossed to system level using an average loss factor of 7.6 percent). DSM is the cumulative DSM amount using a blended average coefficient of 49 percent. Please refer to the table below which has been updated with intervening years between 2022 and 2033:

	Modeled Peak (MW)	Res Heat Peak (MW)	EV (MW)	DR (MW)	C&I Elect. (MW)	Large Cust. (MW)	DSM (MW)	Firm Peak (MW)	Inter. Cust. (MW)	System Peak (MW)
2022	2,011	2	3	-4	2	107	-14	2105	146	2,255
2023	2,028	3	6	-12	3	109	-26	2111	147	2,271
2024	2,047	5	12	-24	5	111	-38	2118	148	2,290
2025	2,062	6	23	-36	28	113	-48	2148	156	2,340
2026	2,085	7	38	-39	51	115	-58	2199	157	2,395
2027	2,111	8	60	-39	73	116	-70	2259	157	2,455
2028	2,133	9	90	-39	96	117	-82	2325	157	2,521
2029	2,158	10	122	-38	118	118	-93	2395	156	2,589
2030	2,183	11	157	-38	139	118	-102	2468	156	2,662
2031	2,207	11	197	-37	160	119	-112	2545	156	2,739
2032	2,233	12	240	-37	181	119	-121	2627	156	2,820

(g) Unexplained is the name for the components that all the available drivers and models cannot explain. All forecasting models have uncertainty in their predictions, and the unexplained item attempts to quantify this. It is calculated as the difference between forecast minus actuals.

(h) Please refer to Attachment 2.

EfficiencyOne

Nova Scotia Energy Efficiency and Demand Response Potential Study for 2021-2045

Prepared by Navigant for EfficiencyOne

FILED
August 14, 2019

NAVIGANT

Nova Scotia Energy Efficiency and Demand Response Potential Study for 2021-2045

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E. EXECUTIVE SUMMARY

EfficiencyOne engaged Navigant Consulting, Inc. (Navigant) to prepare energy efficiency (EE) and demand response (DR) potential studies for electricity for the province of Nova Scotia over a 25-year forecast horizon, from 2021 to 2045.

For energy efficiency, the study's objective is to assess the potential in the residential and business, nonprofit and institutional (BNI) sectors by analyzing energy efficiency measures, defining operational and maintenance activities to keep existing devices or equipment in good working order, and improving end user behaviours to reduce energy consumption. The energy efficiency analysis efforts provide input data to Navigant's Demand Side Management Simulator (DSMSim™) model, which calculates technical, economic and market savings potential across Nova Scotia. These results[1] will be used to inform integrated resource planning (IRP), and energy efficiency and demand response program design in Nova Scotia.

E.1 Estimation of Energy Efficiency Potential

Navigant employed its proprietary DSMSim™ potential model to estimate the technical, economic and market savings potential for electricity and winter peak demand across Nova Scotia. DSMSim™ is a bottom-up technology diffusion and stock tracking model implemented using a System Dynamics[2] framework. The model explicitly accounts for different types of efficient measures such as retrofit (RET), replace-on-burnout (ROB), and new construction (NEW), and the impacts these measures have on savings potential. The model then reports the technical, economic and market potential savings in aggregate in total for the province, and by sector, customer segment, end use category, and highest-impact measures.

This study defines **technical potential** as the energy savings that can be achieved assuming that all installed measures can immediately be replaced with the efficient measure, wherever technically feasible, regardless of the cost, market acceptance, or whether a measure has failed (or "burned out") and is in need of being replaced.

Economic potential is a subset of technical potential, using the same assumptions regarding immediate replacement as in technical potential, but limiting the calculation only to those measures that have passed the benefit-cost test chosen for measure screening, in this case the Total Resource Cost (TRC) test or the Program Administrator Cost (PAC) test.

Market potential (also referred to as achievable potential) further considers the likely rate of demand-side management (DSM) resource acquisition, given factors like the rate of equipment turnover (a function of a measure's lifetime), simulated incentive levels, consumer willingness to adopt efficient technologies, and the likely rate at which marketing activities can facilitate technology adoption. The adoption of DSM measures can be broken down into calculation of the "equilibrium" market share and calculation of the dynamic approach to equilibrium market share, as discussed in more detail below.

Technical potential savings reported in this study are "gross", rather than "net," meaning they do not include the effects of natural change, spillover, freeridership, and other effects not attributable to DSM programs. Providing gross potential is advantageous because it permits a reviewer to more easily calculate net potential when new information about net-to-gross ratios or changing end use intensities become available.

[1] Demand Response analysis results are provided in Appendix D. Energy Efficiency analysis results are provided in Appendix F.

[2] See Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill, 2000, for detail on System Dynamics modelling. Also see http://en.wikipedia.org/wiki/System_dynamics for a high-level overview.

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E.2 Estimation of Demand Response Potential

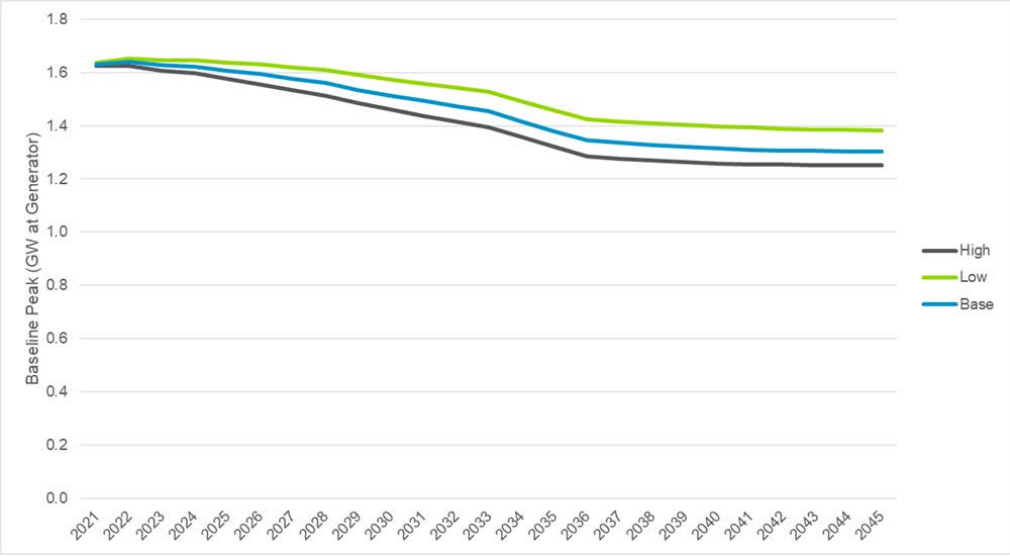
Navigant developed DR potential and cost estimates using a bottom-up analysis. The analysis involved five steps: (1) characterize the market, (2) develop baseline projections, (3) define and characterize DR options, (4) develop key assumptions for potential and costs, and (5) estimate potential and costs. Navigant used both primary data from EfficiencyOne and relevant secondary sources for this analysis, as documented in this report. The DR potential analysis efforts provide input data to Navigant's Demand-Response Simulator (DRSim™) model, which calculates total DR potential across Nova Scotia.

Navigant developed DR potential and cost estimates using a bottom-up analysis. The analysis involved five steps: (1) characterize the market, (2) develop baseline projections, (3) define and characterize DR options, (4) develop key assumptions for potential and costs, and (5) estimate potential and costs. Navigant used both primary data from EfficiencyOne and relevant secondary sources for this analysis, as documented in this report. The DR potential analysis efforts provide input data to Navigant's Demand-Response Simulator (DRSim™) model, which calculates total DR potential across Nova Scotia.

The foundation for the DR potential assessment is to develop disaggregated bottom-up peak demand projections (post EE) by customer class, segment and end use. The steps to determine the baseline peak projections were: (1) define the peak period, (2) calculate coincident peak demand factors, (3) obtain end use shares, (4) determine energy sales after subtracting Navigant's energy efficiency potential study results, and (5) apply coincident peak demand factors and end use shares to calculate bottom-up peak demand projections.

Three different scenarios from the energy efficiency potential study were considered in the baseline winter peak projections: (1) low, (2) base, and (3) mid. These correspond to the scenarios low, base, and high, respectively, in the DR study. Figure ES-1 shows the baseline peak projections across the three DR scenarios.

Figure ES-1. Winter Baseline Peak Forecast by DR Scenario (GW at generator)



Source: Navigant analysis

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The DR options included in the analysis are representative of commonly deployed and emerging DR programs in the industry and are listed in Figure ES-2.

Figure ES-2. Summary of Demand Response Options Considered in Study

DR Option	Brief Description	Eligible Customer Classes	End Use
Direct Load Control (DLC)	Control of electric loads by a thermostat and/or load control switch.	Residential Small Commercial Small Industrial	Electric Furnace[3] Heat Pump[4] HVAC[5] Hot Water
BNI Curtailment	Firm capacity reduction commitment. $/kW payment based on delivered capacity, administered through third party aggregators.	Large Commercial Large Industrial Interruptible	HVAC Lighting Water Heating Total Facility
BTM Battery Control	Use of batteries for load shifting and dispatching to the grid.	All classes	Batteries
EV Charging Control	Charging modulation to reduce EV demand during peak periods	EV	EV
Critical Peak Pricing (CPP)	A rate schedule with significantly higher peak prices to discourage consumption during peak times	All classes	Total Facility
Behavioural Demand Response (BDR)	Targeted notifications and incentives are provided to customers to encourage peak shaving	Residential	Total Facility

Source: Navigant

Navigant calculated both technical and market potential associated with implementing DR programs for this study. Technical potential refers to the theoretical maximum potential under 100% participation of the eligible load. Navigant calculated technical potential by multiplying the eligible load/customers by the unit impact for each sub-option. An important caveat is that, by definition, technical potential calculation does not consider participation overlaps. Therefore, the technical potential estimates for each DR option should be considered independently.

Navigant assessed cost-effectiveness of DR options and calculated achievable potential by multiplying achievable participation assumptions (subject to program participation hierarchy) by the technical potential estimates. Achievable potential also accounts for customer opt-out during DR events. In addition to the potential estimates, Navigant developed annual and levelized costs by DR options.

[3] Electric furnace and heat pump apply to residential. For small commercial and industrial, Navigant refers to the end use load type as HVAC.

[4] *Ibid.*

[5] *Ibid.*

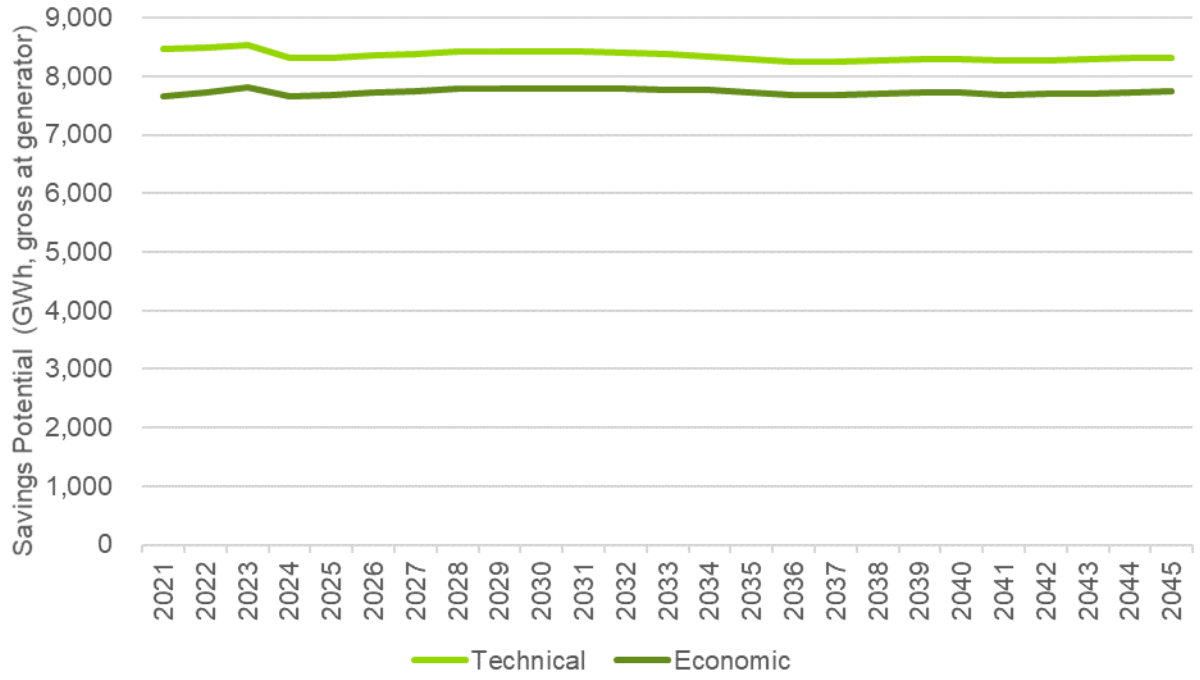
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E.3 Findings

E. 3.1 EE Potential Results

Figure ES-3 provides the technical and economic potential at generator for Nova Scotia. Technical and economic potential remain relatively flat over the 25-year study horizon, around 8,300 GWh and 7,700 GWh (gross at generator), respectively.

Figure ES-3. EE Technical and Economic Potential Electricity Savings (GWh, gross at generator)

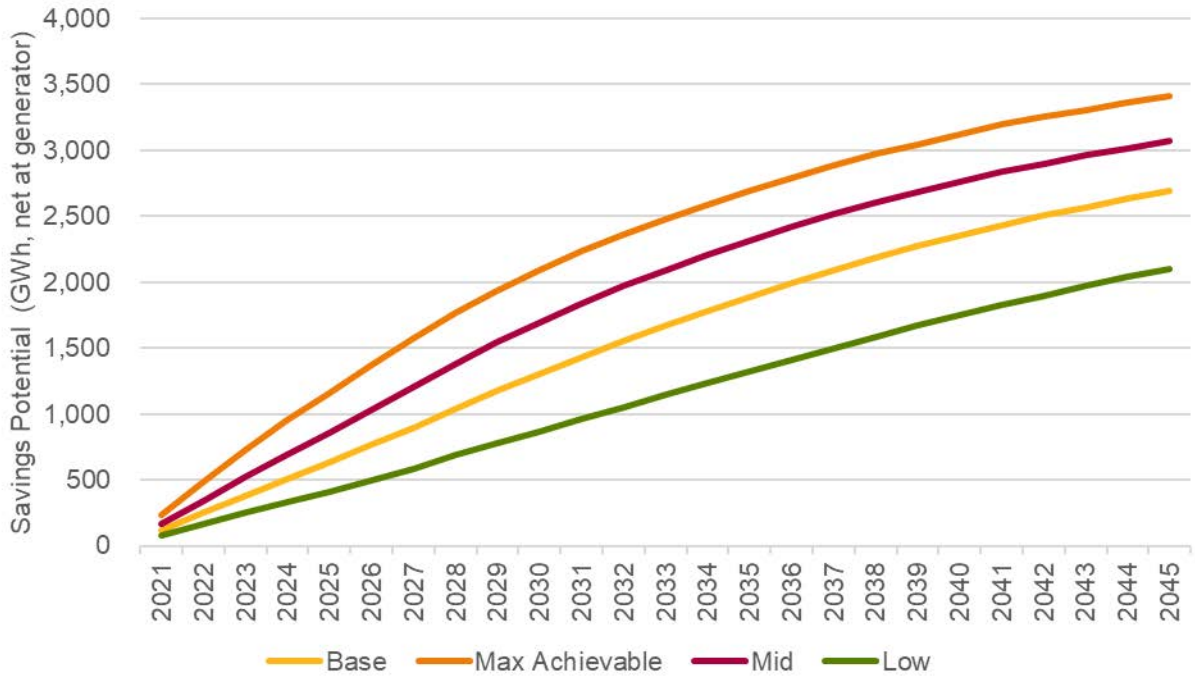


Source: Navigant analysis

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Figure ES-4 shows the cumulative potential results for the four market potential scenarios presented; (1) maximum achievable, (2) mid case, (3) base case, and (4) low case, which range from more than 2,000 GWh to just under 3,500 GWh (net at generator) over the 25-year period. Technical and economic potential savings are gross, while market potential is net of freeridership.

Figure ES-4. EE Market Potential Electricity Cumulative Savings (GWh, net at generator)

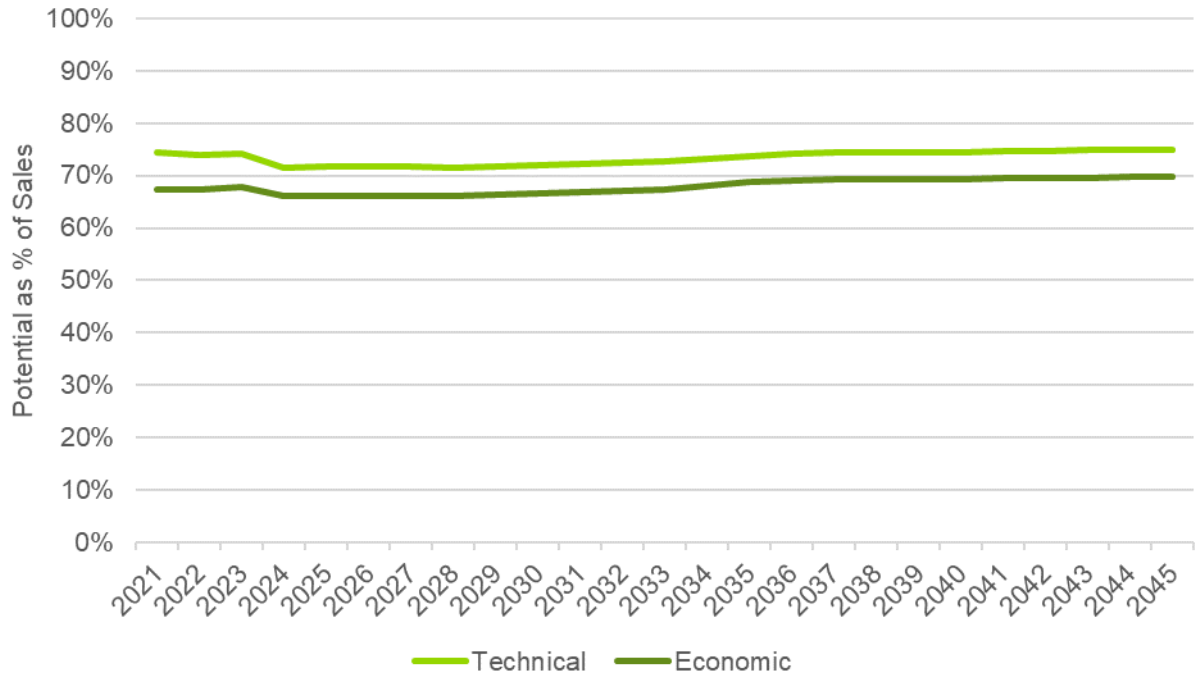


Source: Navigant analysis

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Figure ES-5 presents the technical and economic electricity savings at generator potential as a percentage of customers' total electricity consumption. Annually, technical and economic potential savings ranges from 66% to 75% of electricity sales over the 25-year period. These technical potential savings are due in part to the inclusion of fuel-switching measures, allowing a very large portion of HVAC load to be technically removed.

Figure ES-5. EE Technical and Economic Potential Electricity Savings as a Percent of Total Sales (%)

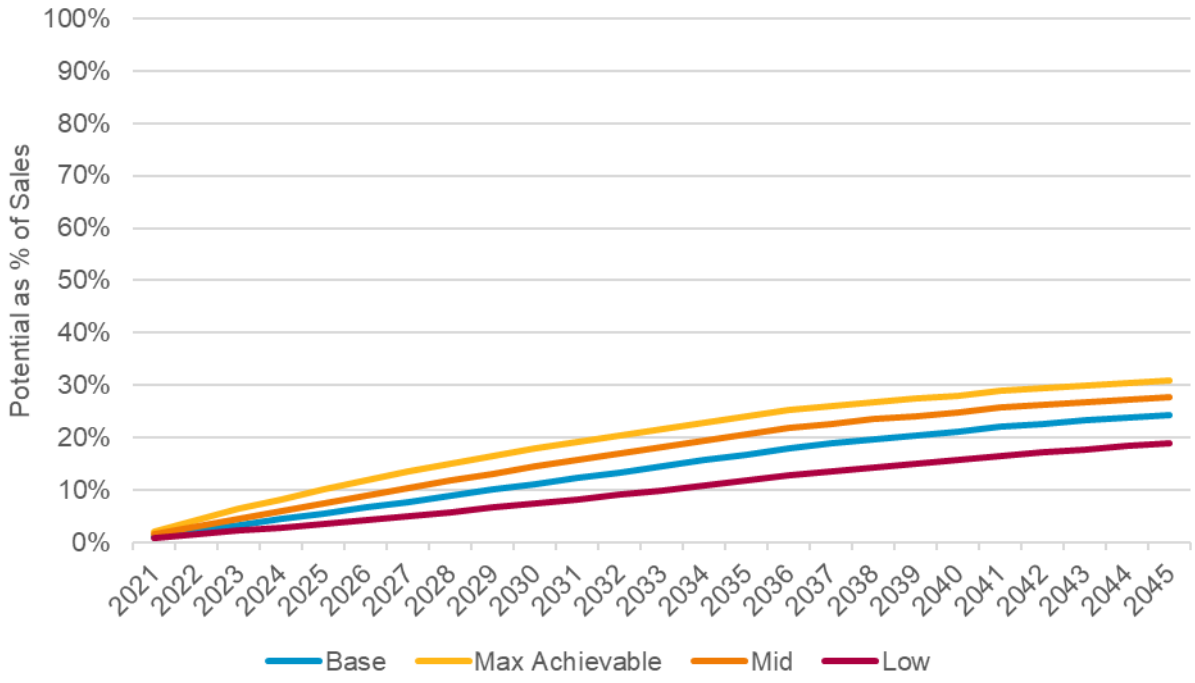


Source: Navigant analysis

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Figure ES-6 presents cumulative achievable electricity savings at generator potential as a percentage of customers' total electricity consumption for the four market potential scenarios. Overall, market potential scenarios range from the low case at 19% to maximum achievable at 31% of electricity sales over the 25-year period.

Figure ES-6. EE Market Potential Electricity Cumulative Savings as a Percent of Total Sales (%)

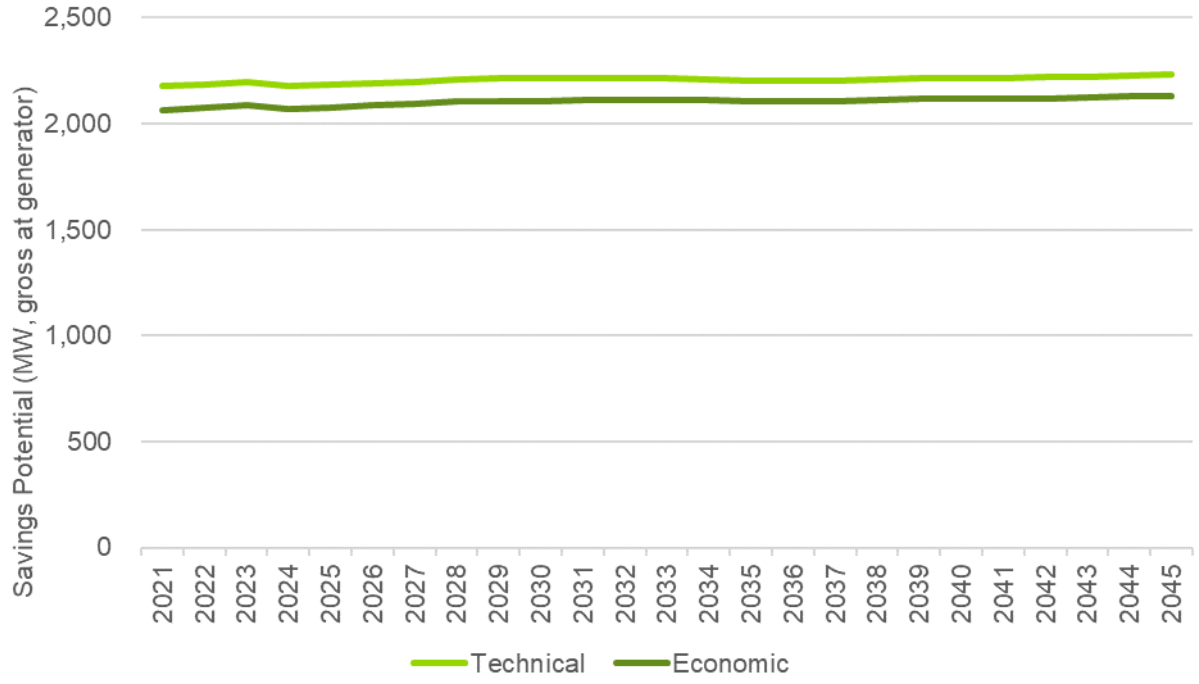


Source: Navigant analysis

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The total technical and economic winter peak at generator demand savings potential are shown in Figure ES-7. Similar to the electricity results, technical and economic savings remain relatively flat over the 25-year study horizon, at around 2,100 to 2,200 MW (gross at generator). Technical and economic potential savings are gross.

Figure ES-7. EE Technical and Economic Potential Winter Peak Demand Savings (MW, gross at generator)

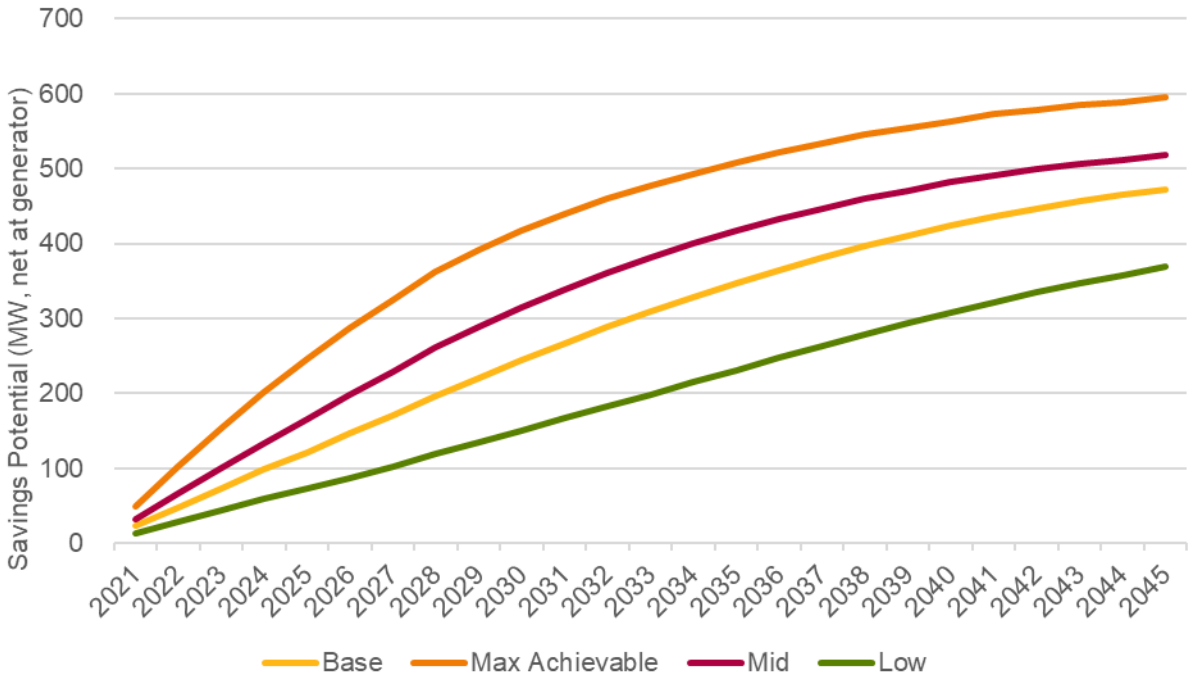


Source: Navigant analysis

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Figure ES-8 presents market winter peak demand results for four market potential scenarios; (1) maximum achievable, (2) mid case, (3) base case, and (4) low case, and ranges between 375 MW and 600 MW (net at generator) over the 25-year period. Market potential is net of freeridership.

Figure ES-8. EE Market Potential Winter Peak Demand Cumulative Savings (MW, net at generator)



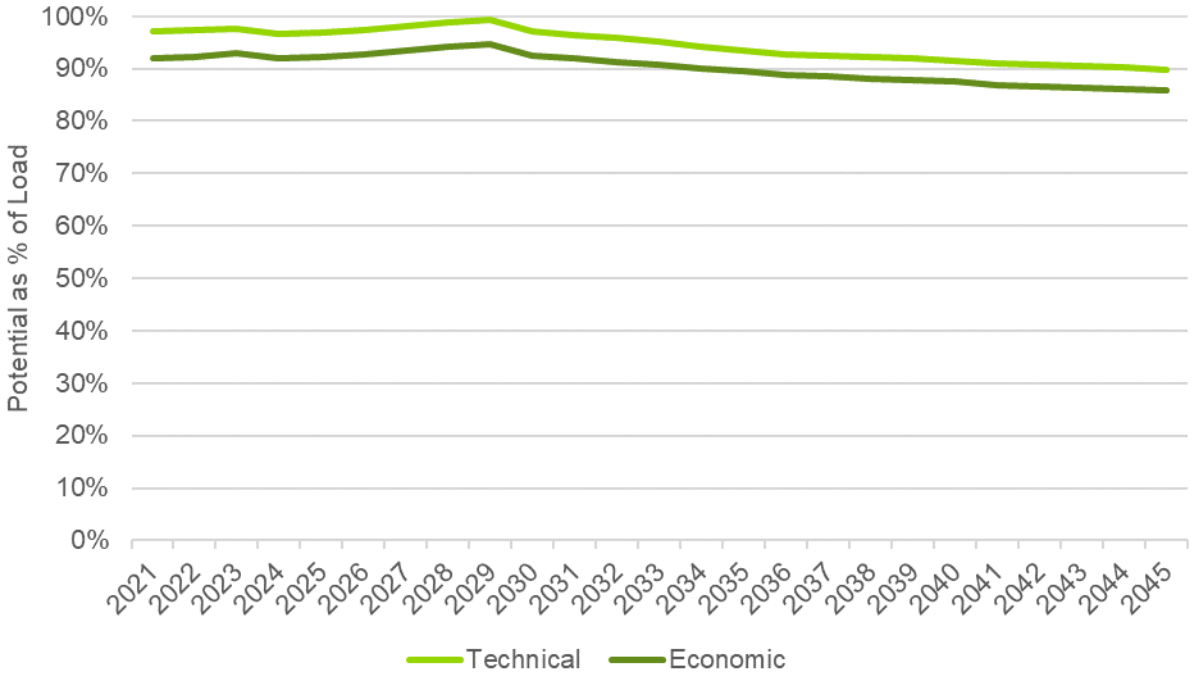
Source: Navigant analysis

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Figure ES-9 presents the technical and economic winter peak demand at generator savings potential as a percentage of customers' total winter peak electricity load. Annually, technical and economic potential savings ranges around 85% to 99% over the 25-year period, in a large part due to fuel switching potential in HVAC.

The demand percent of sales values presented in this report are also higher than expected due to differing line loss factors in this study and the forecasted Nova Scotia Power system requirement document. The system requirement document, from which the total at generator demand forecast is sourced, indicates a 6.7% average line loss when calculating generation requirements. Line losses for the residential sector used in the at generator potential estimates are 14.7%, per NS Power's 2014 Cost of Service Study.

Figure ES-9. EE Technical and Economic Potential Winter Peak Demand Savings as a Percent of Total Load (%)

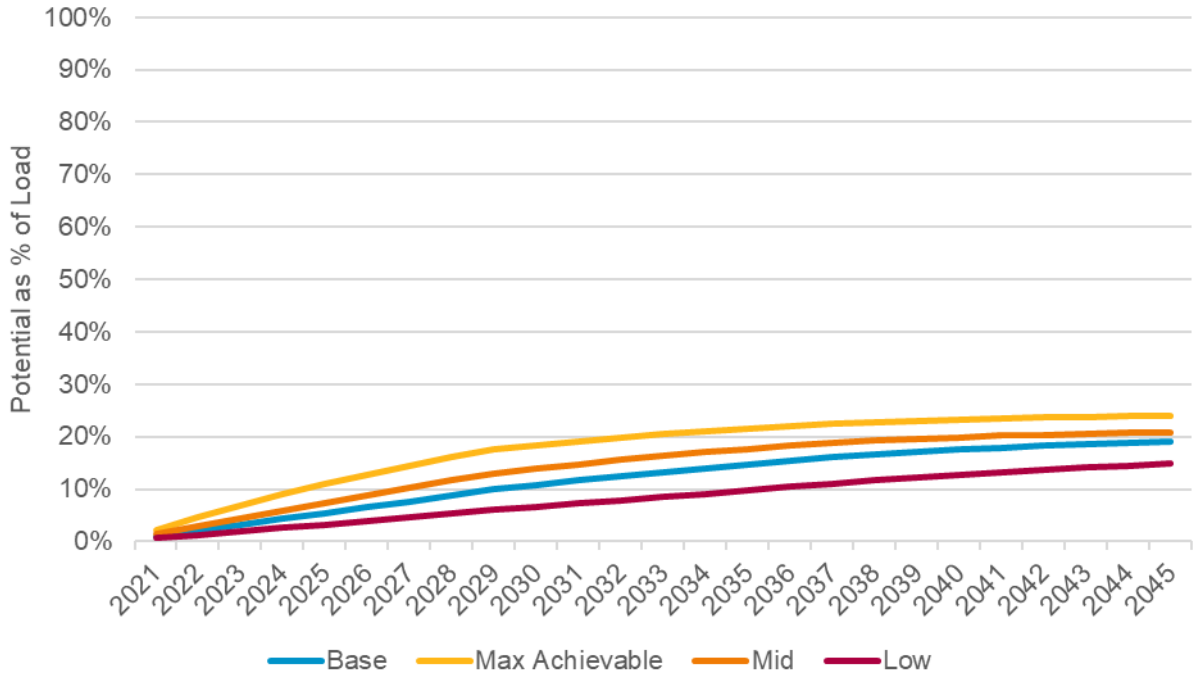


Source: Navigant analysis

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Figure ES-10 presents the market winter peak demand at generator savings potential as a percentage of customers' total winter peak electricity load. Overall, market potential scenarios range from the low case at 15% to maximum achievable at 24% over the 25-year period.

Figure ES-10. EE Market Potential Winter Peak Demand Savings as a Percent of Total Load (%)

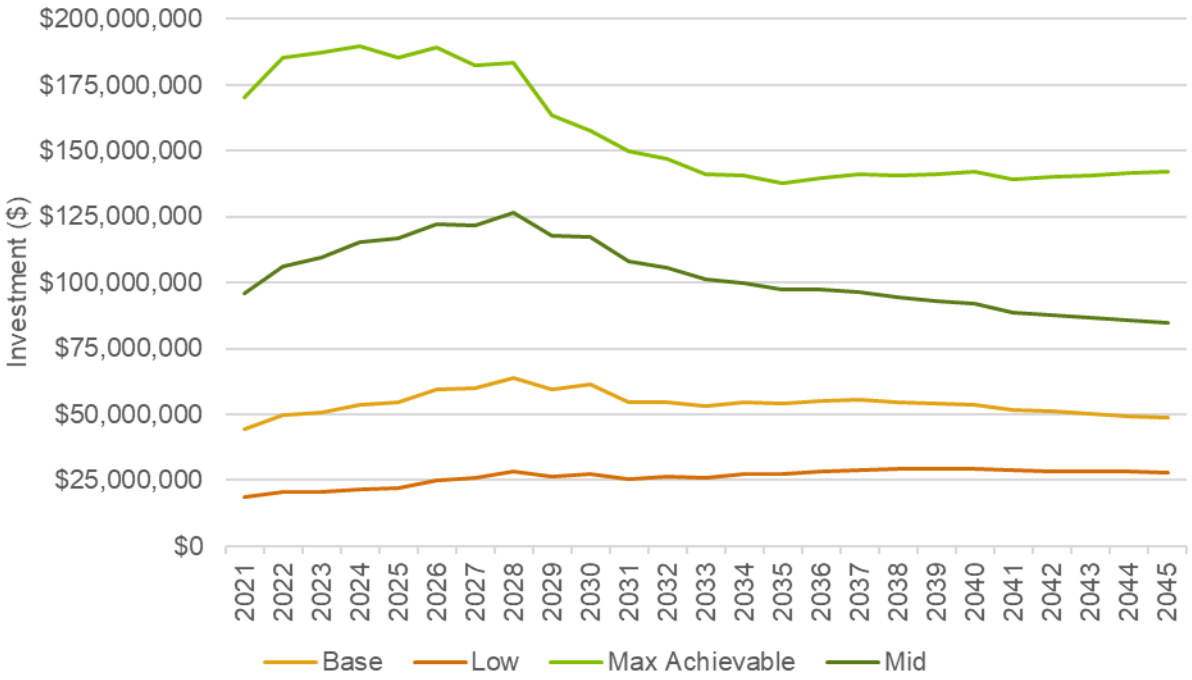


Source: Navigant analysis

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Figure ES-11 presents the level of investment in nominal dollars for each of the four achievable scenarios over the 25-year time horizon. The maximum achievable scenario reaches close to $190 million in 2024 and then declines to around $140 million annually. The mid case varies between $96 million to more than $126 million in 2028 and then declines to below $85 million. The base case ranges from around $44 million to $64 million annually. The low case varies from approximately $18 million to $28 million annually.

Figure ES-11. EE Total Portfolio Annual Investment, by Achievable Potential Scenario (nominal $)



Source: Navigant analysis

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E. 3.2 DR Potential Results

Figure ES-12 shows the TRC benefits, costs (in NPV 2020 dollars) and benefit-cost (BC) ratios calculated for each DR option, as well as the results from the PAC test for the base case. All DR options, other than BTM Battery Control and EV Charging control are cost-effective for this case.

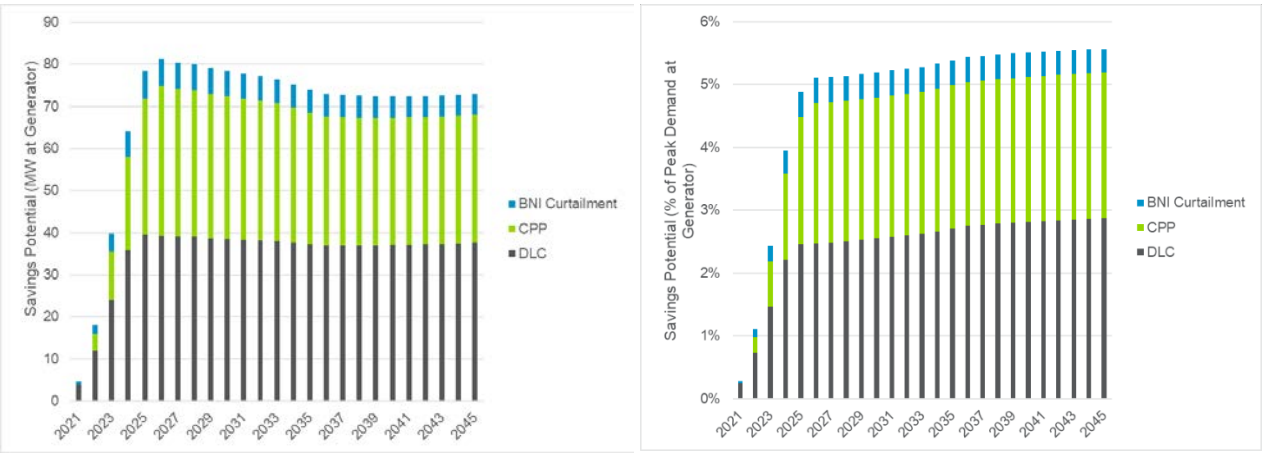
Figure ES-12. DR Achievable Base Case, Benefit-Cost Assessment by Option (TRC and PAC Test Benefit-Cost Ratios)

DR Option	Benefits (NPV 2020 million $)	Costs (NPV 2020 million $)	TRC Test Benefit-Cost Ratio	PAC Test Benefit Cost Ratio
CPP	65.05	25.23	2.58	2.58
DLC	81.47	66.60	1.22	1.06
BNI Curtailment	12.67	11.03	1.15	0.87
Behavioural DR	5.52	5.78	0.96	0.96
BTM Battery Control	19.17	22.91	0.84	0.73
EV Charging Control	3.05	11.08	0.28	0.26

Source: Navigant analysis

Figure ES-13 shows the MW breakdown of the DR achievable potential by cost-effective DR option, and the achievable potential as a percentage of Nova Scotia Power's peak demand. The cost-effective DR achievable potential under the base case is estimated to increase steadily to about 80 MW by 2027 and then declines and plateaus at about 70 MW from 2035 onward. The decline in potential is associated with the decrease in baseline peak demand for DR with progressively higher savings from energy efficient measures. Under the base scenario, the cost-effective achievable potential steadily increases to around 5% of peak demand in 2027 and increases slightly during the following years. DLC constitutes almost half of the total potential followed by CPP at 42%. BNI Curtailment share is significantly smaller at around 8%.

Figure ES-13. DR Achievable Potential for Cost-Effective Options (MW at generator and Percent of Peak Demand)



Source: Navigant analysis

E. 2.2.1 Demand Response Investment Levels

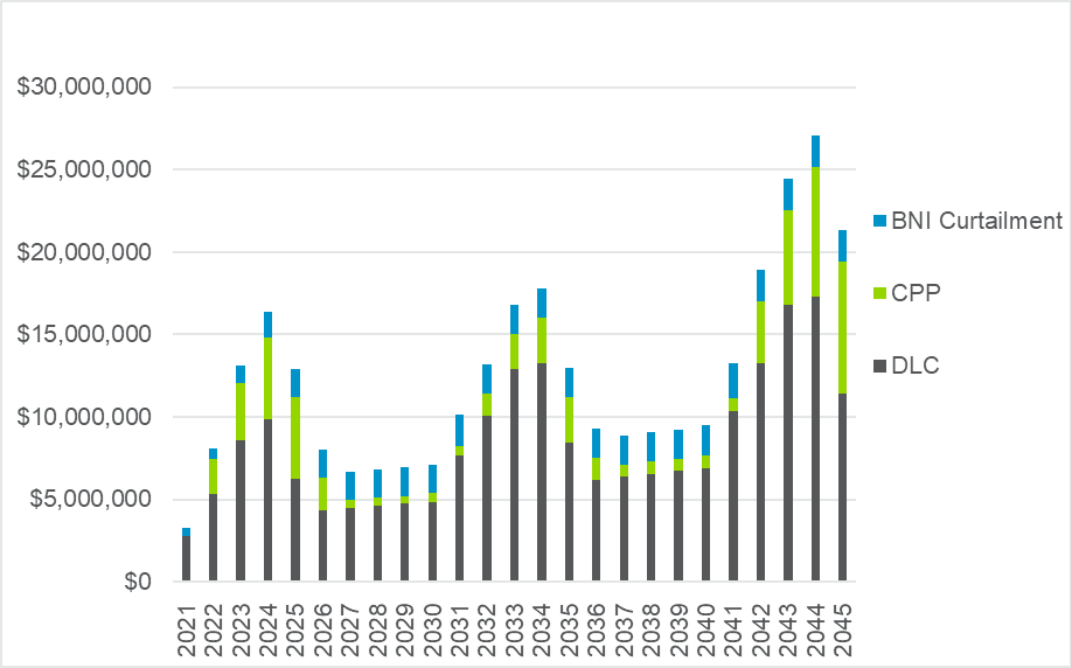
Figure ES-14 summarizes the annual program investment for cost-effective DR options in the base case. The results indicate the following:

- The program investment for DLC increase steadily from 2021 to 2024 and then drop until 2026. The costs remain steady and then spike back up in 2031 because the DLC program has a life of 10 years, so technology enablement and program development costs are re-incurred at this time. From then on, costs fluctuate in accordance with program participation, which is tied to the saturation of the end-use devices (heat pumps, electric furnace, water heating), until it reaches 2041, when the program costs are re-incurred again. The two main cost components for DLC are the control equipment cost (thermostats and switches), and customer incentives for DR program participation.

- CPP program investment is relatively high during its initial ramp up between 2022 to 2026, and then drops in 2027-2028 when the program is fully ramped up. The program has a life of 10 years and the technology is assumed to have a 20-year life, so program development costs and technology enablement are re-incurred on a 20 and 10 year cycle, respectively. Enabling technology costs for customers that are offered the rate in conjunction with enabling technologies is a major cost component. Other significant costs are marketing and outreach to customers to enroll them in rates.

- The investment for BNI curtailment is tied directly to the potential estimates, as majority of the program costs are rolled into an aggregator payment and represented as a delivery cost in terms of $/kW-yr.

Figure ES-14. DR Annual Program Costs by Option for Cost-Effective DR Options ($)



Source: Navigant Analysis

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E. 2.2.2 Scenario Analysis

For the low and high cases, Navigant adjusted assumed participation levels, incentive amounts, marketing spending, and equipment saturation to determine the impacts on the DR achievable potential. The peak demand forecasts also varied by case, as these were tied to the different demand reduction scenario impacts from the energy efficiency potential study. Three different scenarios from the Energy Efficiency Potential Study were considered in the baseline winter peak projections: (1) low, (2) base, and (3) mid. These correspond to the scenarios low, base, and high, respectively, in the DR study. A critical assumption for the high case was the default opt-out participation model for CPP.

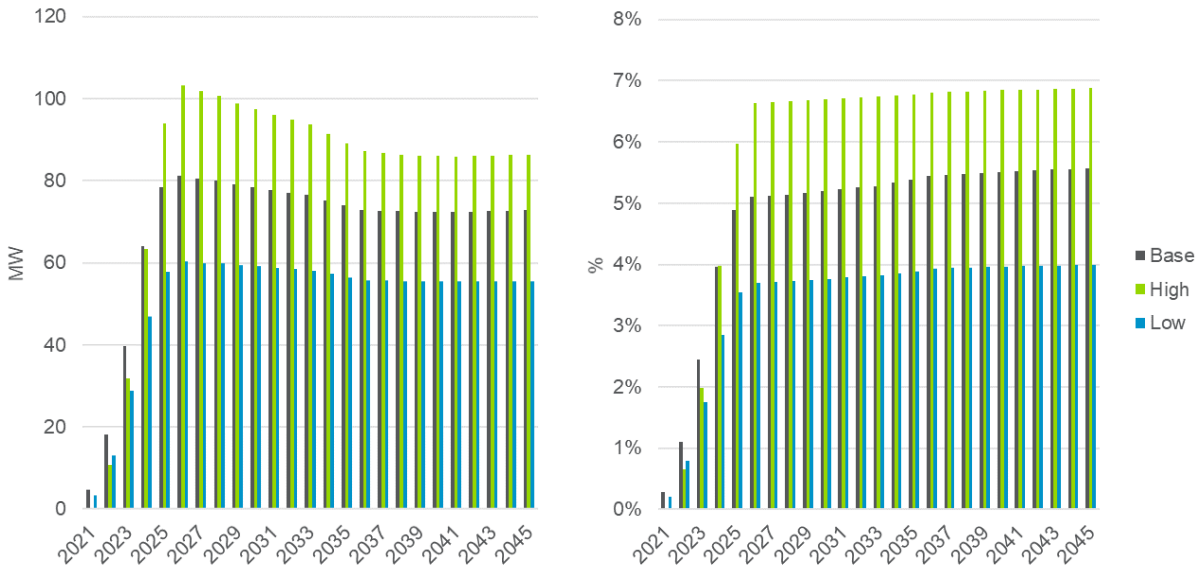
The high participation in the CPP program under the default opt-out model causes the remaining pool of customers available to participate in other DR programs to be relatively small. The fixed costs of the program, such as annual program administration costs and program startup costs, get allocated over a smaller number of customers for DLC and BNI Curtailment, which render these options to be not cost-effective under the high scenario. High scenario costs are only associated with CPP and behavioural DR, so annual program costs are lower in the high scenario than the base scenario, despite greater savings potential, primarily from CPP. The low scenario costs are lower than the base scenario costs due to lower participation levels and lower per participant incentives and marketing costs.

The annual portfolio costs (in nominal dollars) are expected to increase from:

- $3.3 million in 2021 to $21.4 million in 2045 for the base scenario
- $2.7 million in 2022 to $12.0 million in 2045 for the high scenario
- $2.4 million in 2021 to $12.1 million in 2045 for the low scenario

Figure ES-15 shows achievable MW potential and percent of peak load potential reduction by scenario for cost-effective DR options only. The high scenario is 18% greater than the base scenario potential, while the low potential is approximately 24% lower than the base case potential. The 2045 potential under the low, base, and high scenarios represents approximately 4.1%, 5.6%, and 6.9% of NS Power's peak demand in 2045, respectively.

Figure ES-15. DR All Scenarios, Achievable Potential (MW at Meter and Percent of Peak Demand)



Source: Navigant Analysis

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1. INTRODUCTION

This section provides an overview of the potential study, including background and study goals, a discussion of the report's organization and key caveats and limitations of the potential study. Navigant's best-in-class modeling tools ensure the rigour, validity and sensibility required of the DSM Potential Study results. Our potential study models have been validated in numerous provinces and U.S. states, and our DSM potential studies and models have been quoted by ACEEE as being "robust and transparent… [and] their methodology for forecasting participation is industry standard best-practice."[6]

As is typical in the development of such studies, Navigant worked collaboratively with EfficiencyOne and stakeholders, through the Demand Side Management Advisory Group (DSMAG) to ensure the study, to the fullest extent, best reflects current Nova Scotia market conditions. Navigant received considerable guidance and feedback from the DSMAG, including EfficiencyOne staff, particularly in the development of global input assumptions and measure characterizations. We also carefully considered, and as appropriate, were responsive to stakeholders' input, incorporating their feedback into the analysis approach.

1.1 Context and Study Goals

Navigant was retained by EfficiencyOne to develop an estimate of the potential for electric energy efficiency and demand response in Nova Scotia during the 2021 to 2045 (25-year) timeframe. Navigant worked with EfficiencyOne and stakeholders to develop information on current levels and patterns of energy use in Nova Scotia, characterize potential measures which could be implemented to increase energy efficiency and demand response through DSM programs in the province, and develop estimates of energy efficiency and demand response potential. The study data and analysis will be used to inform integrated resource planning, and energy efficiency and demand response program design in Nova Scotia. Figure 1-1 summarizes the various elements of the project scope.

Figure 1-1. Summary of Project Scope

Element	Dimensions
Forms of Energy	Electricity
Type of Potential	Energy Efficiency (Energy and Demand) and Demand Response Technical, Economic (EE only), Achievable
Sectors	Residential and Business, Nonprofit and Institutional (BNI)
Climate	Single Weather Zone
Time Horizon	2021- 2045 (25 years)

1.2 Stakeholder Engagement

EfficiencyOne engaged stakeholders beginning in the fall of 2018 to encourage input into the development of the 2019 Electricity Demand Side Management Potential Study. The stakeholder engagement process and level of participation in Nova Scotia was typical of what Navigant has seen in other jurisdictions. Navigant appreciates the thorough review and comments provided by stakeholders, and thanks them for their feedback and participation in the process. Navigant carefully considered all stakeholder input and, as appropriate, incorporated this feedback to inform and enhance the potential study, in terms of meeting study objectives, reflecting the Nova Scotia content, and using the most up to date Nova Scotia data. Stakeholder engagement throughout the study included the following:

[6] ACEEE study titled "Cracking the TEAPOT: Technical, Economic, and Achievable Energy Efficiency Potential Studies," August 2014.

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- Baseline Study and Pre-Modelling Scenarios' Assumptions WebEx Presentation held May 28, 2019
- 2019 Potential Study Technical Conference held July 16, 2019
- Three formal stakeholder review and comment periods:
    - On March 22, 2019, EfficiencyOne shared draft Potential Study Assumptions and Modelling Plan with the DSMAG, and invited written comments from stakeholder until April 5, 2019
    - On May 27, 2019, EfficiencyOne shared a draft Baseline Study Report with the DSMAG, and invited written comments from stakeholder until June 7, 2019
    - On July 15, 2019, EfficiencyOne shared a draft Potential Study Report with the DSMAG. and invited written comments from stakeholder until July 26, 2019

1.3 Caveats and Limitations

There are several caveats and limitations associated with the results of this study, as detailed below.

1.3.1 Program Design

The results of this study provide the savings potential in Nova Scotia. However, this potential study is not intended to provide, nor does it have information on, detailed program designs. Different program designs and delivery mechanisms would inevitably result in different levels of adoption of efficient technologies, which means the output of this study is an estimate of what could be achieved under the specific set of assumptions outlined in this study. Program design is typically a separate activity and is outside the scope of this study.

1.3.2 Measure Characterization

The scope of this study employed both primary data collection techniques and a variety of secondary data sources for estimates of measure savings, costs and market presence (e.g., saturations and densities). Primary data, specific to Nova Scotia was used wherever possible. Where Nova Scotia-specific data was not available, the best available data was used. This situation and approach did not limit our ability to achieve the study objectives and is consistent with the previous electricity potential study for Nova Scotia and Navigant's experience in other jurisdictions.

Furthermore, the team considers the measure list used in this study to appropriately focus on those technologies likely to have the highest impact on savings potential over the study horizon. However, there is always the possibility unidentified emerging technologies may arise that could increase savings opportunities over the forecast horizon, and broader societal changes may affect levels of energy use in ways not anticipated in the study. Similarly, this study does not make assumptions about future code and standard changes beyond those already planned for the study period.

Potential studies must make assumptions about the adoption of technologies and options that inevitably come with a degree of uncertainty. While techniques such as use of payback acceptance curves and technology diffusion models are considered to provide reasonable aggregate estimates of savings potential, such techniques (which must be applied to dozens or in some cases hundreds of energy efficiency measures) are limited in their ability to accurately predict adoption for specific measures or in specific customer segments.

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For energy efficiency, model calibration steps (e.g., comparing forecast results with past achieved results) seek to ground the forecasts in the real world, but inaccuracies are bound to exist the further one drills into a technology or segment—even if the aggregate results are considered to be reasonable. One reason that aggregate results can in many cases be more reliable than individual technology or segment results is that forecasting inaccuracies, at the measure-level will exhibit a pooling effect when aggregated up to the portfolio (whereby positive or negative differences at a finer level of aggregation can help to offset each other in an aggregate result). While more in-depth technology adoption techniques do exist (e.g., discrete choice analysis) to improve the forecast accuracy for any given technology, application of these techniques to the quantity of measures analyzed in studies such as this are not typically warranted considering the dramatic increase in costs one would have to incur to calibrate a different adoption model for every single measure.

1.4 Interpreting Results

This report includes a high-level account of savings potential results across Nova Scotia and focuses largely on aggregated forms of savings potential. Energy efficiency potentials are estimated at the finest level of granularity, which is at the measure-level within each customer segment. The measure-level data is mapped to the various customer segments and end-use categories to permit a reviewer to easily create custom aggregations. Measure level results are available in the study appendices as noted below. Demand response potentials are estimated using a bottom-up analysis, with primary data from NS Power and relevant secondary sources of information, as documented in the study appendices (noted below).

1.5 Report Organization

The report is organized as follows:

Section 2 – provides an overview of **Global Data** developed and used in the study.

Section 3 – discusses the **Energy Efficiency Measure Characterization**, including key parameters.

Section 4 – presents the **Energy Efficiency Technical Potential Forecast** for energy efficiency measures, including a summary of results by sector and end use**.**

Section 5 – provides the **Energy Efficiency Economic Potential Results** for energy efficiency measures, including a summary of results by sector and end use**.**

Section 6 – presents the **Energy Efficiency Market Potential Approaches**, including discussion of equilibrium market share, behavioural measures, investment and incentive strategy, re-participation, and model calibration.

Section 7 – discusses the **Reference Forecast Approach** and scenario configuration.

Section 8 – presents the **Energy Efficiency Market Potential Approach by Scenario** for energy efficiency measures, including a summary of results by sector, end use, customer segment, and measure, as well as cost-effectiveness tests and investment.

Section 9 – provides the **Energy Efficiency Market Potential Sensitivity Analysis Results** by differing key assumptions.

Section 10 – presents the **Demand Response Methodology,** including market characterization, baseline projections, characterization of options, and key assumptions.

Section 11 – provides the **Demand Response Potential and Cost-Effectiveness Results** for the technical and achievable potentials, investment levels, scenario analysis, and discusses snapback effects. Achievable

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potential results are presented for DR options, sub-options, customer class, and building type for cost-effective DR options.

Section 12 – presents the **Conclusion** of the study.

The report also includes the following eleven Appendices:

- Appendix A. Modelling Plan
- Appendix B. Residential Sector and BNI Sector Baseline Study
    - Appendix B-1. Electricity Usage Online Survey Instrument - Residential & Site Visit Follow-up
    - Appendix B-2. Electricity Usage Online Survey Instrument - Commercial
    - Appendix B-3. Electricity Usage Tables - Residential - Self Reported
    - Appendix B-4. Electricity Usage Tables - Commercial - Self Reported
- Appendix C. Demand Response Model Inputs
- Appendix D. Demand Response Model Outputs
- Appendix E. Energy Efficiency Model Inputs
- Appendix F. Energy Efficiency Model Outputs
- Appendix G. EE Base Case Achievable 8760 Loadshape Disaggregation

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2. GLOBAL DATA

Navigant aggregated multiple data sources to simulate many elements of the market conditions in Nova Scotia that help to define the potential for energy saving technologies modelled in this study. These inputs include energy and demand forecasts, residential household counts, business and industrial building stock, heating and hot water fuel splits, and end use energy allocations. Together, these are referred to as the "global" data because they help to define the context of the modeled savings potential, and the scope of potential adoption. To develop these inputs, Navigant used data sources from the Nova Scotia Baseline Study (see Appendix B), EfficiencyOne, Nova Scotia Power, Statistics Canada, Natural Resources Canada, the U.S. Department of Energy's Energy Information Agency (EIA), and others.

Where possible, Navigant prioritized primary data, or data specific to Nova Scotia including:

- Historical consumption and demand data
- Residential accounts data
- Residential (2019) and BNI (2019) end use (Baseline Study) surveys, and site visits (see Appendix B)
- ENS program evaluation reports
- NS Power end use intensity-based forecasts (Load Forecast Models)
- Previous Nova Scotia DSM potential studies

Where Nova Scotia-specific information was not available, Navigant utilized secondary data, including internal Navigant data sources. Navigant's review of these resources was generally used to support the data sources provided by EfficiencyOne and to ensure consistency among EfficiencyOne data, Navigant's estimates, and publicly-available resources. In order to develop the final estimates of energy consumption, Navigant compared and calibrated estimates with actual sales data obtained from Nova Scotia Power's End Use Intensity Models.

2.1 Segmentation of Customer Sectors

Navigant developed electricity consumption, demand, floorspace, customer counts, fuel splits, and end use allocations by sector, and customer segment where possible. Where data was not available to estimate these splits, Navigant aggregated to the sector level. Navigant worked with EfficiencyOne and the DSM Advisory Group to determine an appropriate level of segmentation for each sector.

The segmentation also reflects Navigant's modeling approach for representing efficiency measures within the DSMSim™ model. DSMSim™ models energy efficiency measures at the segment level, and tracks building and equipment stocks for each segment within Nova Scotia. Differences in fuel choices (i.e., space and water heating market shares), types of equipment used (i.e., use of a furnace or boiler for space heating), and equipment and system efficiency levels are all represented within the model for each segment, as required and as permitted by data availability.

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Figure 2-1 shows the segmentation used for the residential and BNI sectors, with additional detail provided for each sector in the following sections.

Figure 2-1. Customer Segments by Sector

Residential	BNI
Mi'kmaw Households	Small Commercial
Single Family Market Rate	Large Commercial
Single Family Low Income	Institutional
Multifamily Market Rate	Industrial
Multifamily Low Income	

Source: Navigant

2.1.1 Residential Sector

Navigant divided residential customers into five segments based on the type of residential building occupied, as shown in Figure 2-2.

Figure 2-2. Description of Residential Segments

Segment	Description
Mi'kmaw	Mi'kmaw Households, blended building type
Single-Family Market Rate	Detached, attached, row and/or townhouses, less than four units
Single-Family Low Income	Detached, attached, row and/or townhouses, less than four units
Multifamily Market Rate	Apartments, attached housing, four or more units
Multifamily Low Income	Apartments, attached housing, four or more units

Source: Navigant

Navigant developed the breakdown of the residential sector into dwelling types based on Nova Scotia customer and StatsCan data. Figure 2-3 shows the stock (residential households) estimates by housing type and Appendix A describes the methodology used to develop this data. Individually-metered multifamily building units are included in the residential sector for purposes of this study, while master-metered multifamily buildings are included in the BNI stock.

Figure 2-3. Base Year Housing Stocks (Residential units)

Housing Type	Dwellings
Mi'kmaw	11,260
Single Family Market Rate	364,233
Single Family Low Income	16,252
Multifamily Market Rate	40,470
Multifamily Low Income	48,756
Total	480,971

Source: Navigant analysis based on Nova Scotia and StatsCan data

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2.1.2 BNI Sector

Navigant divided the BNI sector into four segments. Figure 2-4 provides a list and description for the BNI segments.

Figure 2-4. Description of BNI Segments

Segment	Description
Small Commercial	BNI customer segments were designed to align with 2018 NS Power Data (sales) and EfficiencyOne's Rate and Bill Impact Analysis (customer counts) reports, and reflect blended averages based on rate-code / size bins.
Large Commercial	
Institutional	
Industrial	

Source: Navigant

Navigant selected the BNI segments with the goal that the building types within those segments be reasonably similar in terms of electricity use, operating and mechanical systems, and annual operating hours. This approach allowed for consistency in building characteristics within each segment as required by the measure characterization and modeling processes. These segments were mapped to usage and demand data by rate classes and building type descriptions provided by EfficiencyOne, allowing for the customer segment level disaggregation in this study.

Navigant used household counts for residential, and floorspace for BNI as the stock bases to scale customer adoption. In order to best forecast floorspace for BNI, Navigant applied end-use intensities derived from Nova Scotia Power's 2018 End Use Intensity Model to the load forecast before DSM. Residential household counts were estimated directly from account forecast data, assuming one household per account on average. Figure 2-5 summarizes the resulting floor space estimates developed for each BNI segment for the study's base year, 2019.

Figure 2-5. Base Year BNI Area (million m^2)

Segment	Floor Area (million m^2)	Floor Area (%)
Small Commercial	6.07	13%
Large Commercial	24.53	53%
Institutional	2.84	6%
Industrial	13.16	28%
Total	**46.60**	**100%**

Source: Navigant analysis

2.2 End Use Definitions

The next step in the base year calibration analysis involved the establishment of specific end uses for each customer sector. This potential study defines end uses as a specific activity or customer need that requires energy, such as space heating or domestic water heating, without specifying the particular type of equipment used to satisfy that need.

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Figure 2-6 presents the list of end uses by sector used in the potential study. These end use categories are used primarily for the binning of potential estimates, and for quality control steps to check the range of savings forecasts against the estimated end use consumption.

Figure 2-6. End Uses by Sector

Residential	BNI
Lighting	Lighting
HVAC	HVAC
Domestic Hot Water	Refrigeration
Refrigeration	Cooking & Laundry
Other	Domestic Hot Water
	Process
	Energy Management
	Electronics & IT
	Other

Source: Navigant

2.3 Fuel Shares

Navigant developed fuel share and equipment data for each end use based on the segmentations defined in the previous sections, using the 2019 Nova Scotia Baseline Study results for space heating, and domestic hot water heating. These shares are available in Appendix B.

2.4 End Use Allocations

End use allocations describe the share of baseline energy consumed by a given customer application, such as lighting, refrigeration, of HVAC. Navigant used Nova Scotia Power's 2018 End Use Intensity Model (associated with the 2018 Load Forecast), which calibrates provincial and regional end use allocations to Nova Scotia-specific load characteristics. Navigant mapped NS Power building types and end uses to the customer segments and end uses defined in this study, and used the 2019 estimates as the basis for the baseline end use consumption. End use allocations are used in this study to aggregate results to more digestible categories, and for quality control of intermediate outputs.

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2.5 Electricity Consumption

EfficiencyOne provided Navigant with information on actual sales and customer numbers for Nova Scotia for 2018 through the 2018 Emera Management Discussion & Analysis (MD&A) report. These consumption data were then disaggregated to the customer segment level using customer class and rate segmentations in the 2018 RBIA. Finally, for the energy efficiency modeling portion of the study, these values were calibrated to the 2018 Nova Scotia Power load forecast (before DSM). Figure 2-7 shows the estimated total electricity consumption by sector in 2019 before DSM.

As stated previously, Navigant included individually-metered multifamily housing types in the residential sector and master-metered multifamily housing types in the BNI sector development of stocks and sales forecasts.

Figure 2-7. Nova Scotia Electric Electricity Consumption in 2019 (GWh at meter)

Segment	GWh Consumption
Residential	4,950
BNI	6,209
Total	11,159

Source: Navigant analysis

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3. ENERGY EFFICIENCY MEASURE CHARACTERIZATION

Navigant and EfficiencyOne fully characterized 183 measures across Nova Scotia's residential and BNI sectors. Navigant prioritized measures with high impact, data availability, inclusion in EfficiencyOne's most recent DSM Plan and those most likely to be cost-effective as criteria for inclusion into DSMSim™.

3.1 Energy Efficiency Measure List

Navigant and EfficiencyOne developed a comprehensive measure list of energy efficiency measures likely to contribute to economic potential. Navigant reviewed current ENS program offerings, EfficiencyOne's 2020-2022 DSM Plan, the 2018 potential study update, and potential model measure lists from other jurisdictions to identify energy efficiency measures with the highest expected economic impact. Navigant worked with EfficiencyOne to finalize the measure list and ensure it contained technologies viable for future DSM program planning activities. Navigant did not include a generic future emerging technologies measure that would attempt to capture potential savings from technologies not currently ready for the market. All measures included are currently available in the market and economically viable.

3.2 Energy Efficiency Measure Characterization Key Parameters

The measure characterization effort consisted of defining more than 50 individual parameters for each of the 183 measures included in this study. This section defines 10 key parameters and how these impact technical and economic potential savings estimates.

1. **Measure Definition**: The team used the following variables to qualitatively define each characterized measure:
    - ***Replacement Type****:* Replacing the baseline technology with the efficient technology can occur in three variations:
        i. **Retrofit (RET):** where the model considers the baseline to be the existing equipment, and uses the energy and demand savings between the existing equipment and the efficient technology during technical potential calculations. RET also applies the full installed cost of the efficient equipment during the economic screening. For early retirement measures, the full cost will be reduced by the calculated deferred replacement credit.
        ii. **Replace On Burnout (ROB):** where the model considers the baseline to be the code-compliant technology option, and uses the energy and demand savings between the current code option and the efficient technology during technical potential calculations. ROB also applies the incremental cost between the efficient and code-compliant equipment during the economic screening.
        iii. **New Construction (NEW):** where the model considers the baseline to be the least cost, code-compliant option, and uses the energy and demand savings between this specific current code option and the efficient technology during technical potential calculations. NEW also applies the incremental cost between the efficient and code-compliant equipment during the economic screening.
    - ***Baseline Definition***: Describes the baseline technology.
    - ***EE Definition***: Describes the efficient technology set to replace the baseline technology.
    - ***Unit Basis***: The normalizing unit for energy, demand, cost, and density estimates.

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2. **Sector, and End Use Mapping:** The team mapped each measure to the appropriate end uses, customer segments and sectors. Where Nova Scotia-specific information was not available, Navigant utilized secondary data, including internal Navigant data sources. Navigant's review of these resources was generally used to support the data sources provided by EfficiencyOne and to ensure consistency among EfficiencyOne data, Navigant's estimates, and publicly-available resources. In order to develop the final estimates of energy consumption, Navigant compared and calibrated estimates with actual sales data obtained from Nova Scotia Power's End Use Intensity Models. Section 1.1 describes the breakdown of customer segments with each sector.
3. **Annual Energy Consumption:** The annual energy consumption in kilowatt-hours (kWh) for each of the base and energy-efficient technologies
4. **Coincident Electric Demand**: The peak coincident demand in kilowatts (kW) for each of the base and energy-efficient technologies
5. **Fuel Type Applicability Multipliers**: Assigns the percentage of electric fuel type to measures with electric fuel type such as water heaters and space heating equipment
6. **Measure Lifetime:** The lifetime in years for the base and energy-efficient technologies. The Base and EE measure lifetime only differ in instances where the two cases represent inherently different technologies, such as light-emitting diodes (LEDs) or compact fluorescent lamp (CFL) bulbs compared to a baseline incandescent bulb.
7. **Incremental Costs:** The incremental cost between the assumed baseline and efficient technology, using the following variables:
    - ***Base Costs***: The cost of the base equipment, including both material and labor costs. This is zero for retrofit measures.
    - ***EE Costs:*** The cost of the energy-efficient equipment, including both material and labor costs.
8. **Technology Densities**: This study defines "density" as the number of units of the baseline and efficient technologies. For residential, these densities are on a per home basis, and for BNI these are per 1,000 square meters of building space.[7]
    - ***Base Initial Saturation***: The saturation of the baseline equipment as a percent of total equipment in a territory for a given customer segment
    - ***EE Initial Saturation:*** The saturation of the efficient equipment as a percent of total equipment in a territory for a given customer segment
    - ***Total Maximum Density***: The total number of both the baseline and efficient units in a territory for a given technology
9. **Technology Applicability:** The percentage of the base technology that can be reasonably and practically replaced with the specified efficient technology. For instance, occupancy sensors may only be practical for certain interior lighting fixtures (an applicability less than 1.0), while all existing incandescent exit signs can be replaced with efficient LED signs (an applicability of 1.0).
10. **Competition Group**: The team combined efficient measures competing for the same baseline technology density into a single competition group to avoid the double-counting of savings. (Appendix A provides further explanation on competition groups).

[7] See the accompanying model input workbook for density and saturation sources.

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3.3 Energy Efficiency Measure Characterization Approaches and Sources

This section provides approaches and sources for the main measure characterization variables.

3.3.1 Energy and Demand Savings

Navigant took three general bottom-up approaches to analyzing residential and BNI measure energy and demand savings:

1. **Program Evaluation Data:** For most measures, Navigant used measure-specific program evaluation data from EfficiencyOne to inform energy savings.
2. **Technical Reference Manual (TRM) Standard Algorithms:** Navigant used TRM standard algorithms for unit energy savings and demand savings calculations for certain measures not included in ENS current or historical programs.
3. **Technical Reference Manual (TRM) Standard Algorithms:** Navigant used TRM standard algorithms for unit energy savings and demand savings calculations for certain measures not included in ENS current or historical programs.
4. **Engineering Analysis:** Navigant used appropriate engineering algorithms to calculate energy savings for any measures not included in ENS programs or available TRMs.

3.3.2 Incremental Costs

Navigant relied primarily on EfficiencyOne-provided program data and TRM data for incremental cost data. Navigant conducted secondary research and used a variety of other publicly-available cost data sources indicated in the accompanying measure input detail.

3.3.3 Building Stock and Densities

Navigant relied heavily on the 2019 Nova Scotia Baseline Study (see Appendix B) for information on equipment densities and saturations. Density and saturation inputs for between 70-80% of savings (depending on impact and potential type) were sourced from this study. For lower impact measures, measures not well suited for baseline research, and measures characterized directly through program offerings (e.g. custom, strategic energy management, and behavioural), EfficiencyOne historic program results and other secondary sources were used. These sources are indicated in the accompanying EE measure input detail (see Appendix E).

3.4 Codes and Standards Adjustments

Estimates of future adjustments in savings related to codes and standards are included as part of the measure characterization process.[8] To develop these estimates, Navigant worked with EfficiencyOne to characterize high-impact anticipated codes and standards, based on Canada's Forward Regulatory Plan 2019-2021 (in reference to *Canada's Energy Efficiency Regulations).* This forward regulatory plan consists of planned Amendments 15-16, as well as yet-formalized future planned Amendments. Building code impacts are based on publicly-available information regarding Canada's future goals with respect to building code evolution and adoption.

[8] See the accompanying EE measure input workbook (Appendix E) for codes and standards adjustments.

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4. ENERGY EFFICIENCY TECHNICAL POTENTIAL FORECAST

This section briefly describes Navigant's approach to calculating technical potential and presents the results for Nova Scotia pertaining to total technical savings potential at different levels of aggregation. Results are shown by sector, end use category and highest-impact measures.

4.1 Approach to Estimating Energy Efficiency Technical Potential

This study defines **technical potential** as the total energy savings available assuming that all applicable installed baseline measures can *immediately* be replaced with the "efficient" measure/technology—wherever technically feasible—regardless of the cost, market acceptance, or whether a measure has failed and must be replaced.

The *Modelling Plan for Nova Scotia Energy Efficiency and Demand Response Potential Studies* (see Appendix A) discusses the approach to estimating technical potential in more detail. Navigant used its DSMSim™ model to estimate the technical potential for demand-side resources considered for this study. DSMSim™ is a bottom-up technology-diffusion and stock-tracking model implemented using a System Dynamics framework.[9]

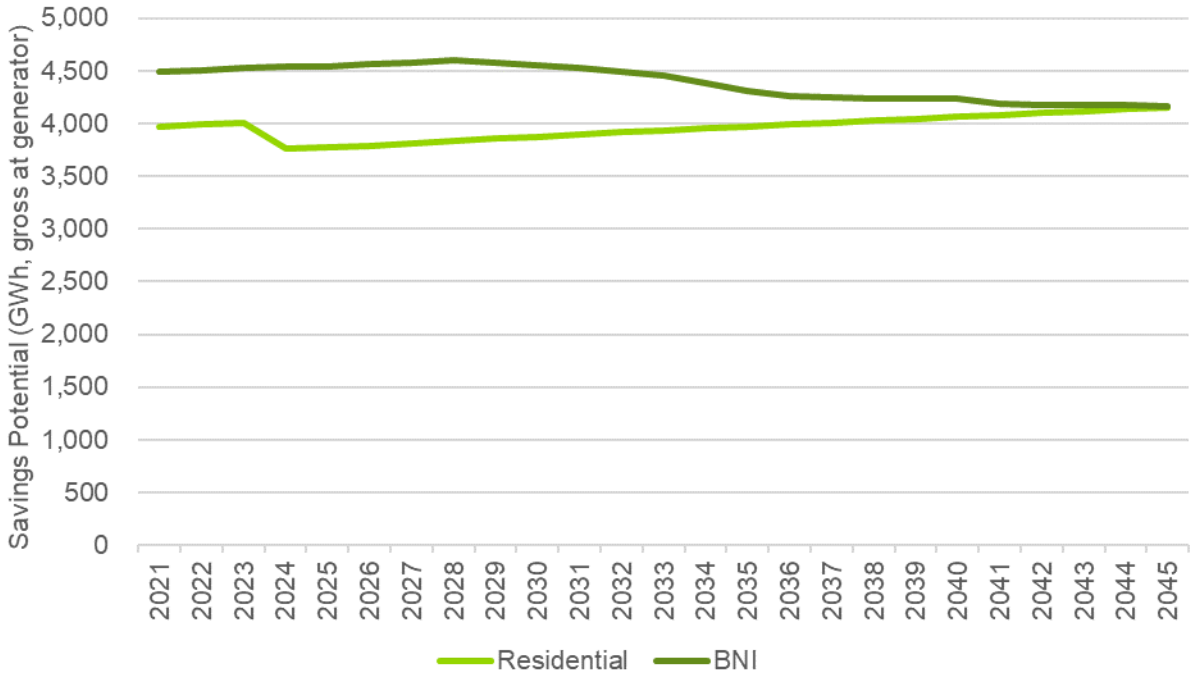
[9] See Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill. 2000 for detail on System Dynamics modelling. Also see http://en.wikipedia.org/wiki/System_dynamics for a high-level overview.

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4.2 Energy Efficiency Technical Potential Results by Sector

Figure 4-1 shows the total electricity technical savings potential, gross at generator, for each sector. The BNI sector technical electricity savings is relatively flat, decreasing slightly near the end of the forecast horizon, reflecting moderately shrinking stocks in line with electric load. The residential sector savings potential ranges from about 3,760 to 4,150 GWh, with savings increasing with the slowly growing customer base over time. The BNI sector savings potential ranges from about 4,165 to 4,600 GWh, with savings increasing slightly and then decreasing over time.

Figure 4-1. EE Technical Potential, Electricity Savings by Sector (GWh, gross at generator)

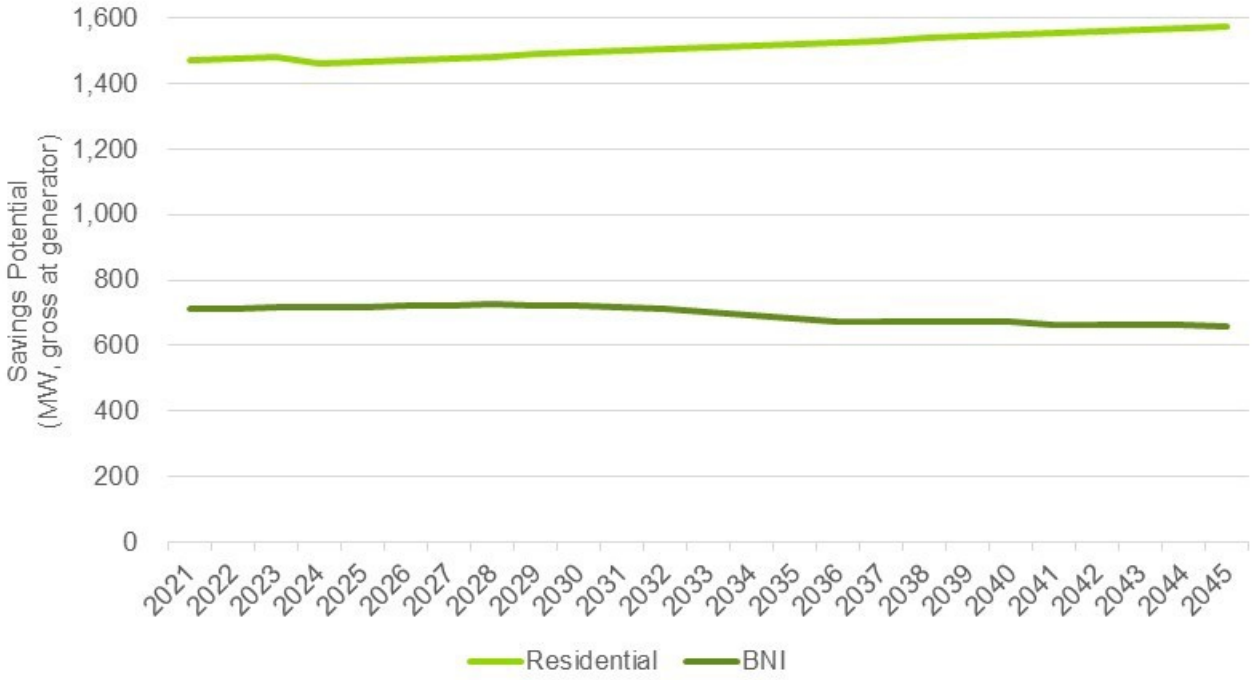


Source: Navigant analysis

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Figure 4-2 shows the winter peak demand technical savings potential, gross at generator, for each sector. The BNI sector winter peak savings ranges between about 660 to 730 MW annually. The residential sector winter peak savings ranges from about 1,460 to 1,570 MW, reflecting the higher overall peak winter load for residential relative to BNI.

Figure 4-2. EE Technical Potential, Winter Peak Demand Savings by Sector (MW, gross at generator)

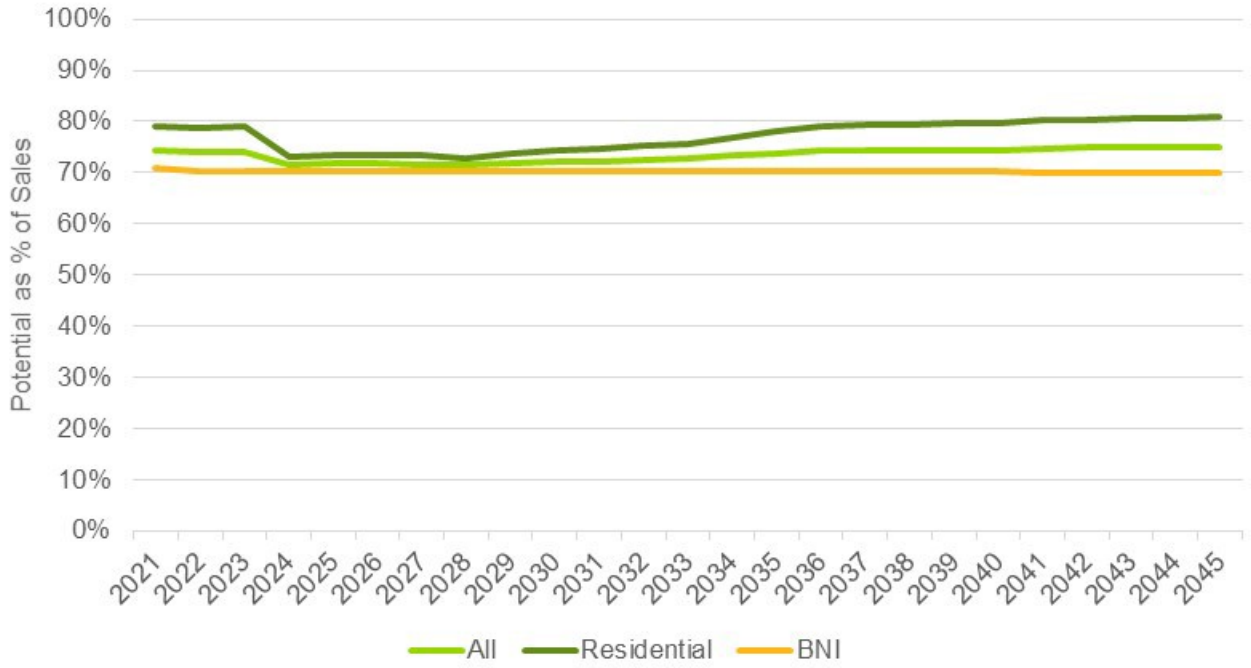


Source: Navigant analysis

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Figure 4-3 shows the electricity technical savings potential for each sector as a percentage of that sector's total forecasted consumption. BNI sector and residential sector technical savings potential as a percent of consumption ranges between 70% to 81% annually. These technical potential savings are due in part to fuel-switching measures, allowing a very large portion of HVAC load to be technically removed.

Figure 4-3. EE Technical Potential, Electricity Savings by Sector as a Percent of Sector Sales (%)



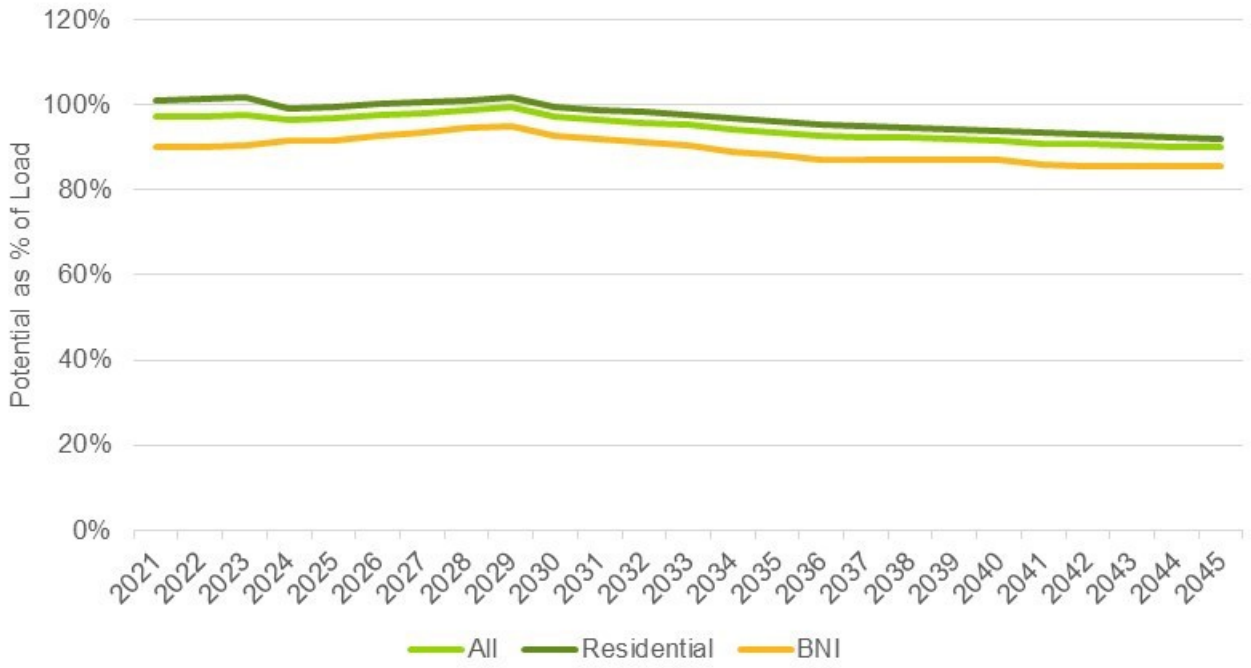
Source: Navigant analysis

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Figure 4-4 shows the winter peak demand technical savings potential for each sector as a percentage of that sector's total forecasted electric load. BNI sector and residential sector technical savings potential as a percent of electric load range from 78% to 99% annually. Similar to the electricity savings as a percent of sales above, this is in a large part due to fuel switching potential in HVAC.

The demand percent of sales values presented in this report are higher than expected due to differing line loss factors in this study and the forecasted Nova Scotia Power system requirement document. The system requirement document, from which the total at generator demand forecast is sourced, indicates a 6.7% average line loss when calculating generation requirements. Line losses for the residential sector used in the at generator potential estimates are 14.7%. The potential study used these higher line loss factors from the 2014 COSS in response to stakeholder feedback to the modelling assumptions, and because it reflects the most recent data available.

Figure 4-4. EE Technical Potential, Winter Peak Demand Savings by Sector as a Percent of Sector Load (%)



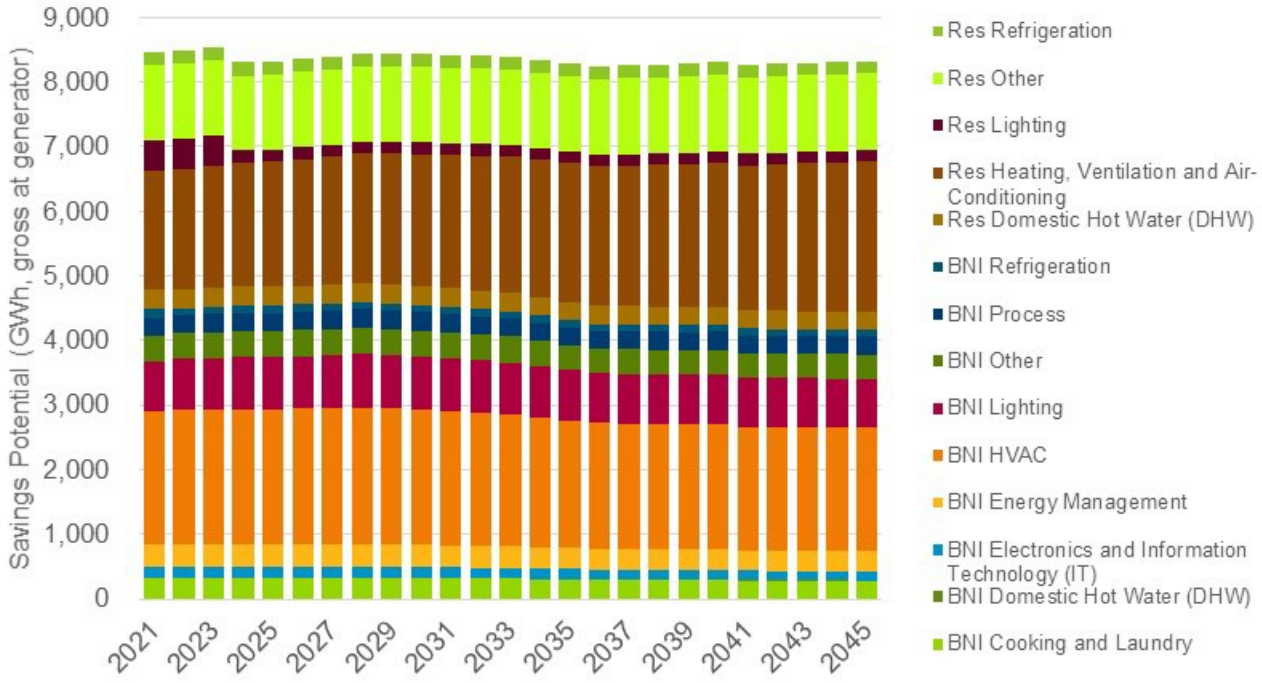
Source: Navigant analysis

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4.3 Energy Efficiency Technical Potential Results by End Use

Figure 4-5 shows the electricity technical savings potential, gross at generator, across all end uses and sectors. The technical potential reflects the large role of electric space heating in Nova Scotia relative to other end uses across both sectors, and the relatively small role of lighting, especially after accounting for expected codes and standards around general service (i.e., screw-in) lamps.

Figure 4-5. EE Technical Potential, Electricity Savings by End Use (GWh, gross at generator)

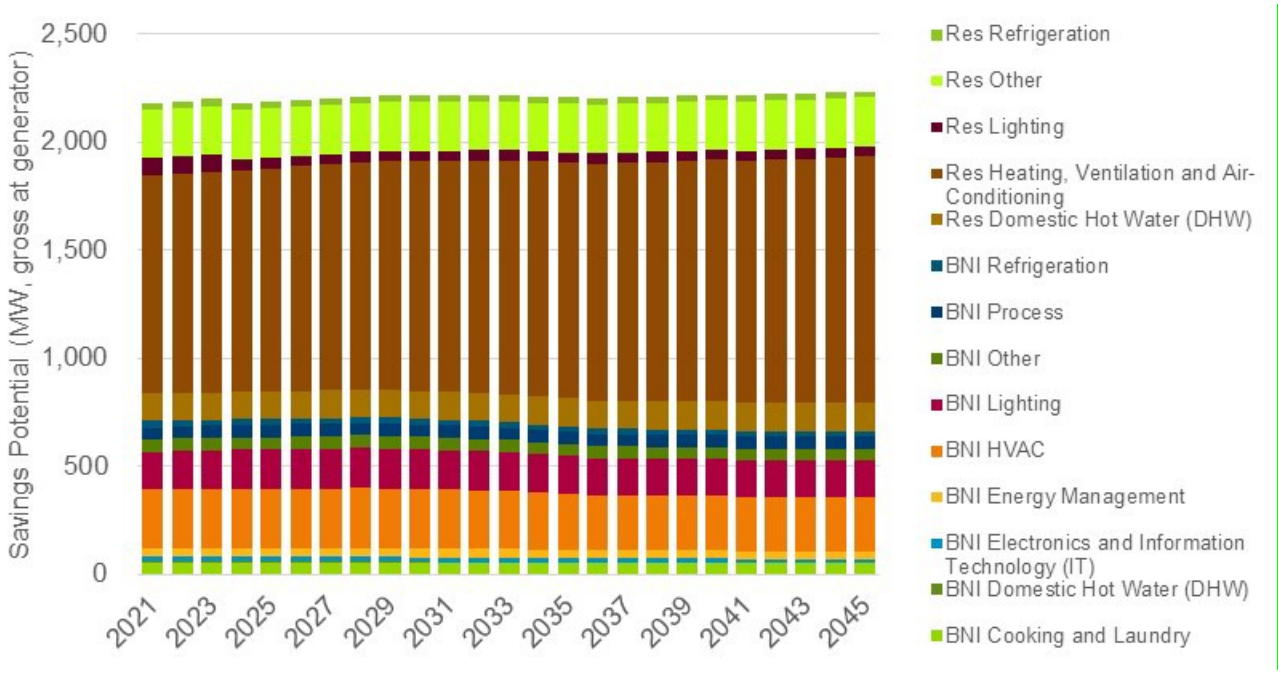


Source: Navigant analysis

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Figure 4-6 shows the winter peak demand technical savings potential, gross at generator, across all end uses and sectors. The dominant end use is residential lighting, followed by BNI lighting. The dominant end use for savings potential again is HVAC, demonstrating the even larger role that electric space heating plays in demand savings potential relative to energy savings potential in Nova Scotia. This is true across end-uses, and represents more than 75% of the total potential for demand reduction through energy efficiency.

Figure 4-6. EE Technical Potential, Winter Peak Demand Savings by End Use (MW, gross at generator)



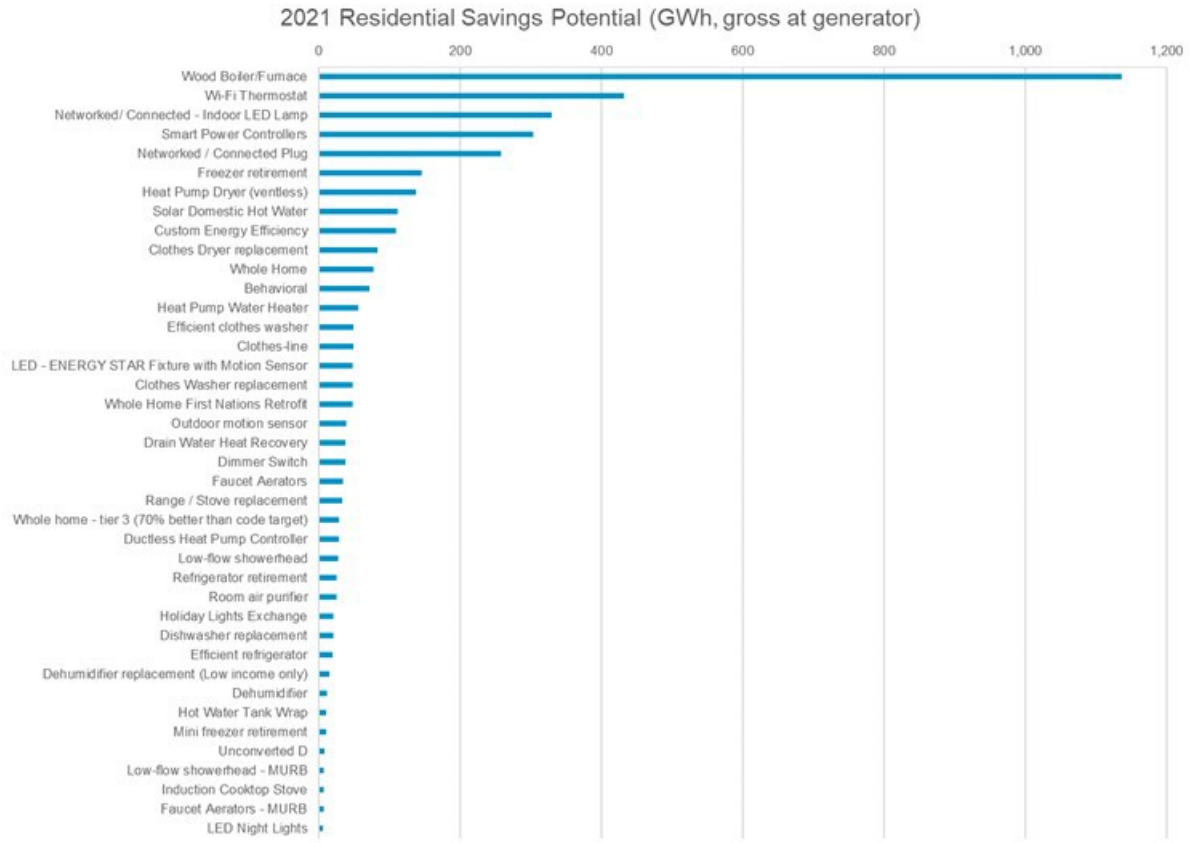
Source: Navigant analysis

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4.4 Energy Efficiency Technical Potential Results by Measure

Figure 4-7 and Figure 4-8 present the top forty measures ranked by their electricity technical savings potential for residential and BNI, gross at generator, in 2021. The measure-level demand savings potential shown is after adjustments made to competition groups, meaning that the measures shown in this section are the measures with the greatest savings potential for their respective competition group. As an example, the measure with the most technical potential in residential heating is the Wood Boiler/Furnace – out competing heat pumps and pellet stoves.

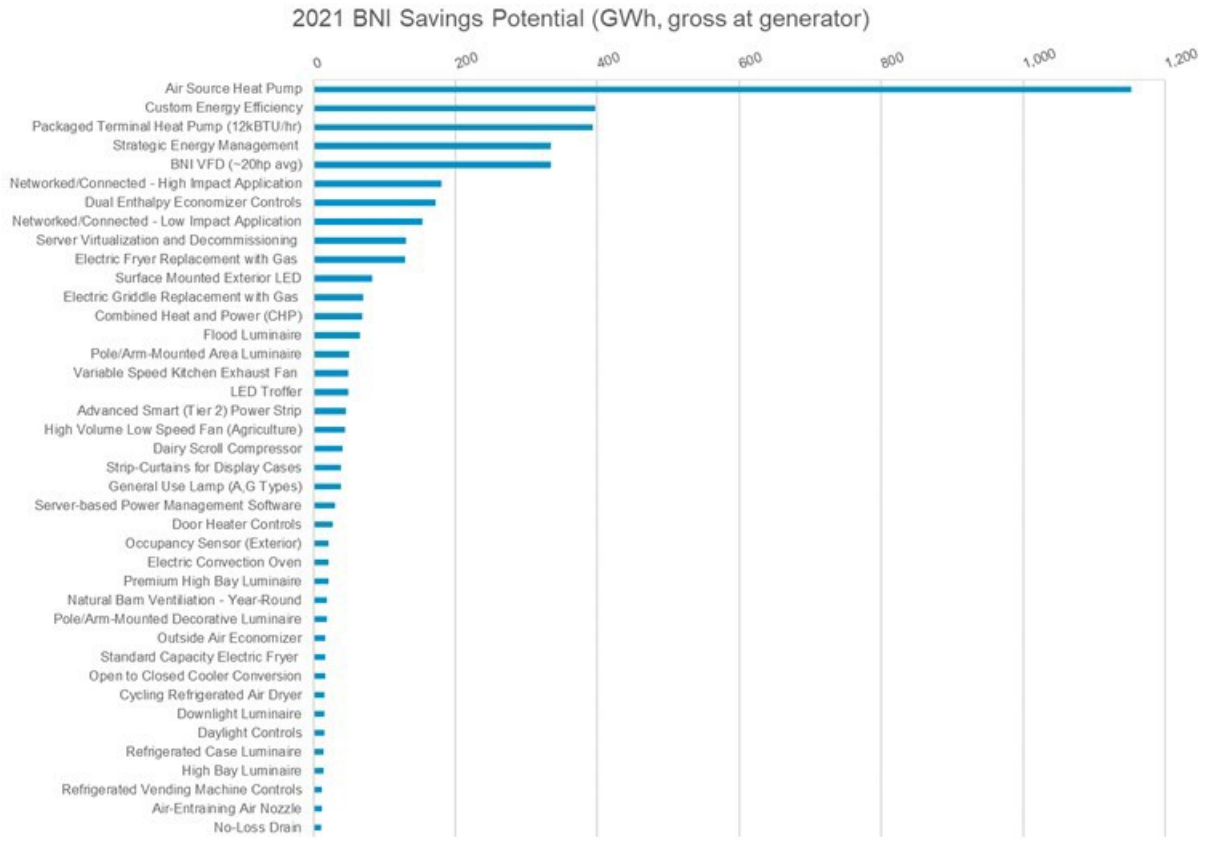
Figure 4-7. EE Technical Potential, 2021 Top 40 Residential Measures for Electricity Savings (GWh, gross at generator)



Source: Navigant analysis

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Figure 4-8. EE Technical Potential, 2021 Top 40 BNI Measures for Electricity Savings (GWh, gross at generator)

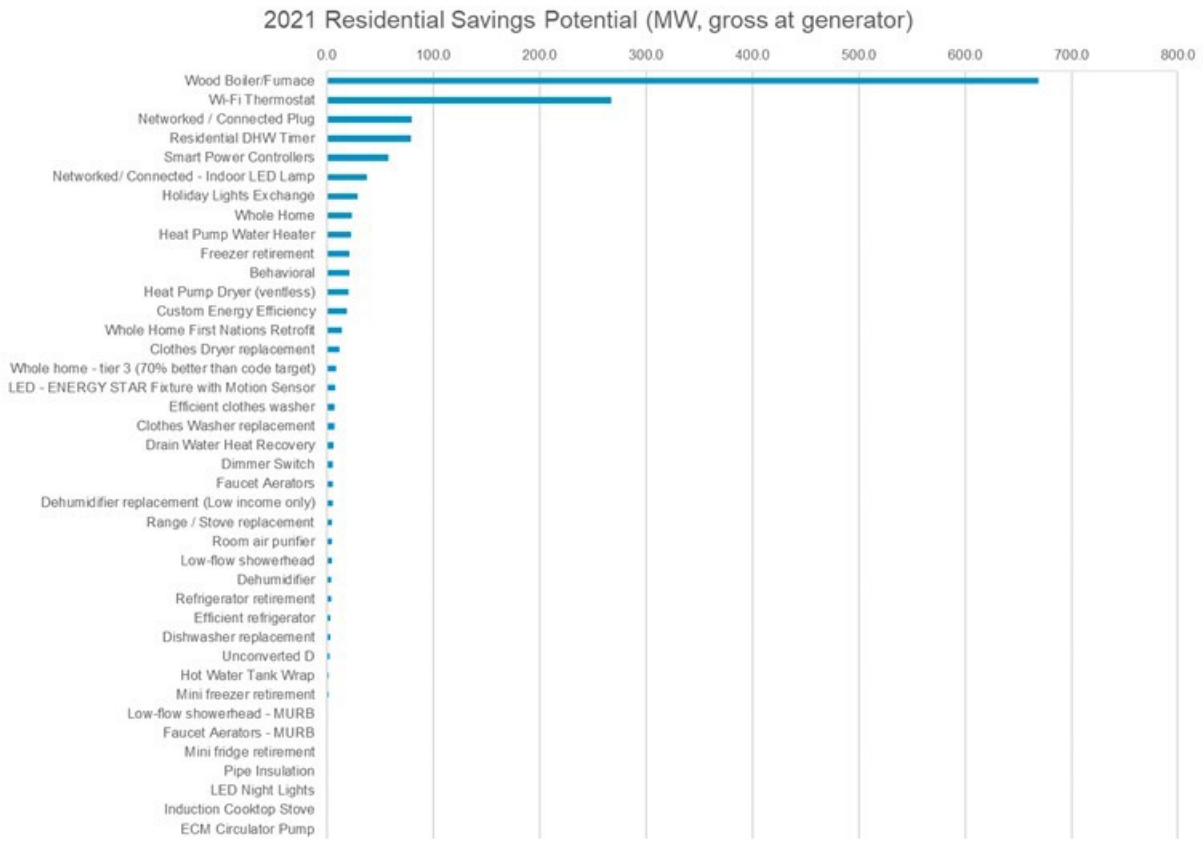


Source: Navigant analysis

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Figure 4-9 and Figure 4-10 present the top forty measures ranked by their winter peak demand technical savings potential for residential and BNI, gross at generator, in 2021. Because of the importance of HVAC, and the fact that these graphs show technical potential after competition, the savings decay down the curve is dramatic. This means that a few measures, such as Wi-Fi Thermostats, Wood Furnaces, and Air Source heat pumps represent the majority of the technical demand reduction potential for each sector.

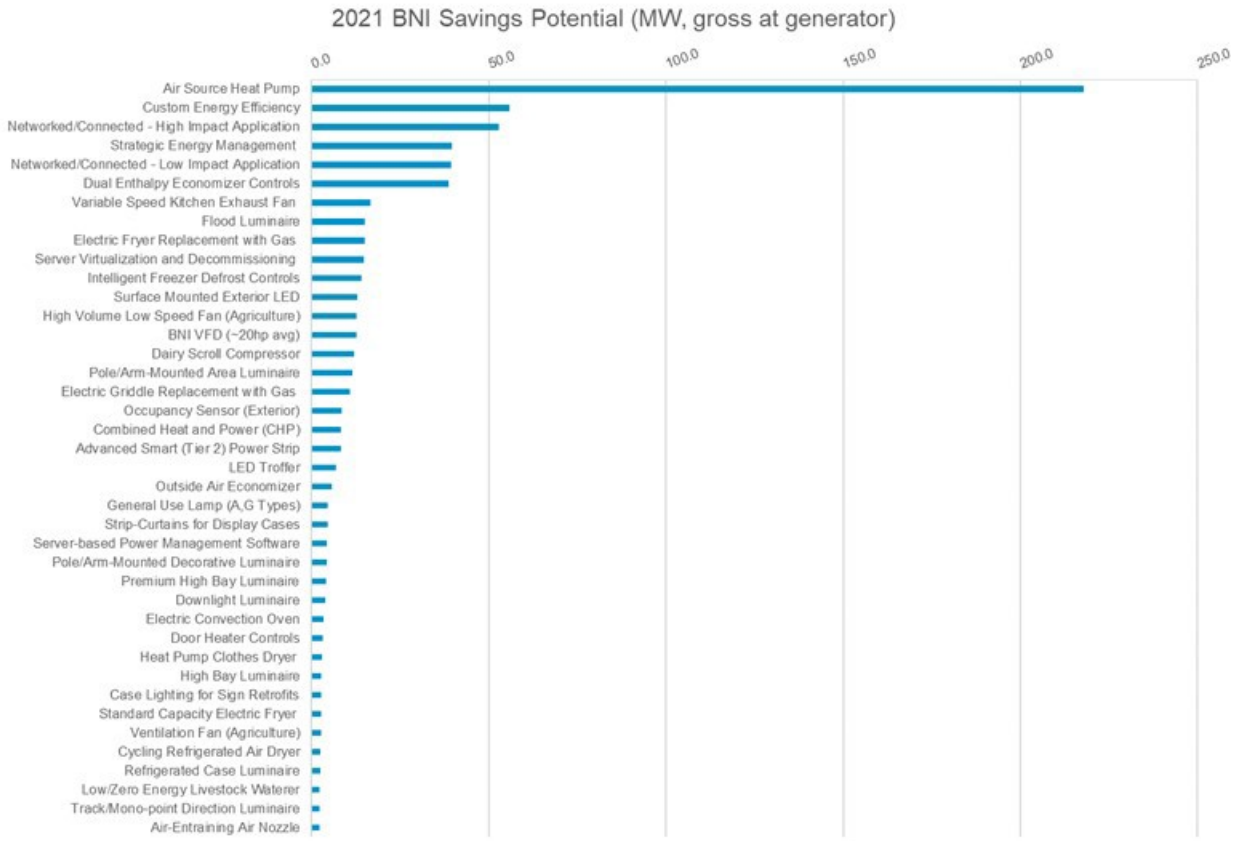
Figure 4-9. EE Technical Potential, 2021 Top 40 Residential Measures for Winter Peak Demand Savings (MW, gross at generator)



Source: Navigant analysis

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Figure 4-10. EE Technical Potential, 2021 Top 40 BNI Measures for Winter Peak Demand Savings (MW, gross at generator)



Source: Navigant analysis

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5. ENERGY EFFICIENCY ECONOMIC POTENTIAL RESULTS

This section describes the economic savings potential, which is potential that meets a prescribed level of cost effectiveness, available in Nova Scotia. The section begins by explaining Navigant's approach to calculating economic potential. It then presents the results for economic savings potential at different forms of aggregation. Results are shown by sector, end use category and highest-impact measures. Additionally, Navigant developed an economic potential scenario using a PAC of 1.0 as the measure screen instead of a TRC of 1.0. Results for this scenario are shown by sector.

5.1 Approach to Estimating Economic Potential

Economic potential is a subset of technical potential, using the same assumptions regarding immediate replacement as in technical potential, but including only those measures that have passed the benefit-cost test chosen for measure screening (in this case the Total Resource Cost (TRC) test, per EfficiencyOne and the DSM Advisory Group's guidance). The TRC ratio for each measure is calculated each year and compared against the measure-level TRC ratio screening threshold of 1.0. A measure with a TRC ratio greater than or equal to 1.0 is a measure that provides monetary benefits greater than or equal to its costs. If a measure's TRC meets or exceeds the threshold, it is included in the economic potential. Measures with TRC ratios less than 1.0 were non-cost-effective and do not appear in the economic potential.

The TRC test is a cost-benefit metric that measures the net benefits of energy efficiency measures from combined stakeholder viewpoint of the program administrator and the customers. The TRC benefit-cost ratio is calculated in the model using Equation 1.

Equation 1. Benefit-Cost Ratio for Total Resource Cost Test

$$TRC = \frac{PV(Avoided\ Costs)}{PV(Technology\ Cost + Admin\ Costs)}$$

Where:

- *PV( )* is the present value calculation that discounts cost streams over time; using the selected discount rate (6.84%);
- *Avoided Costs* are the monetary benefits resulting from electricity and capacity savings (e.g., avoided costs of infrastructure investments, due to electricity conserved by efficient measures);
- *Technology Cost* is the incremental equipment cost to the customer;
- *Admin Costs* are the administrative costs incurred by the program administrator.

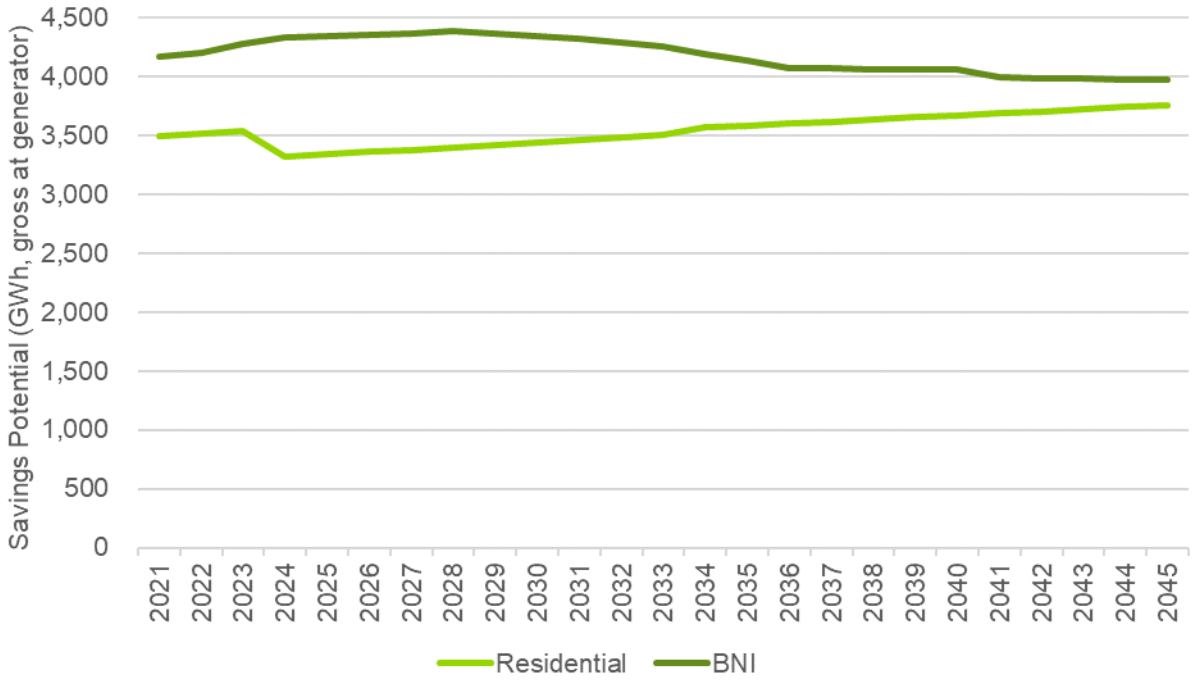
Navigant calculated TRC ratios for each measure based on the present value of benefits and costs (as defined above) over each measure's life. Similar to technical potential, only one "economic" measure (meaning that its TRC ratio meets the threshold) from each competition group is included in the summation of economic potential across measures (e.g., at the end use category, customer segment, sector, service territory or total level). If a competition group is composed of more than one measure that passes the TRC test, then the economic measure that provides the greatest electric savings potential is included in the summation of economic potential. This approach ensures that double-counting is not present in the reported economic potential.

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5.2 Energy Efficiency Economic Potential Results by Sector

Figure 5-1 shows economic electricity savings potential, gross at generator, across all sectors. The residential and BNI economic savings potential grew at a relatively similar rate to technical potential – the majority of measures that comprise the technical potential and win their competition group are also cost-effective, creating a similar trajectory. Further, this shape is reflected in the NS Power load forecast and the customer stock data.

Figure 5-1. EE Economic Potential, Electricity Savings by Sector (GWh, gross at generator)

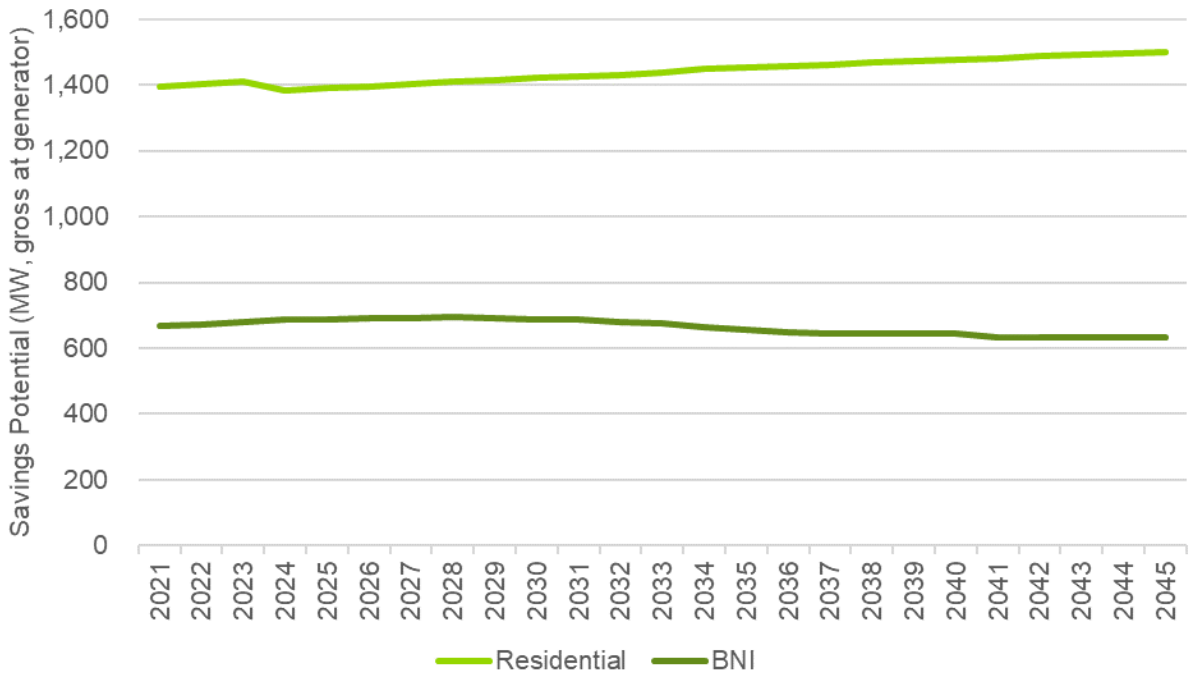


Source: Navigant analysis

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Figure 5-2 winter peak demand potential, gross at generator, in each of the sectors. Relatively high avoided costs (from the 2014 Integrated Resource Plan) in the province make high saving measures more likely to screen, decreasing the gap between technical and economic demand potential.

Figure 5-2. EE Economic Potential, Winter Peak Demand Savings by Sector (MW, gross at generator)

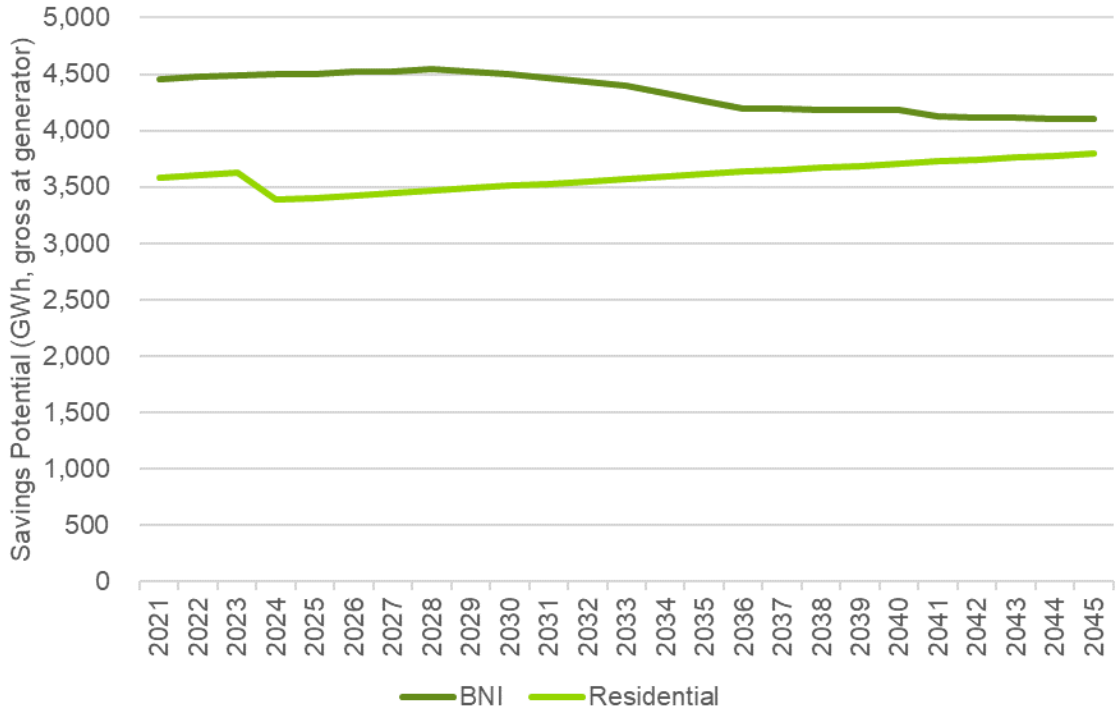


Source: Navigant analysis

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Figure 5-3 presents the economic electricity potential, gross at generator, in each of the sectors using a program administrator cost (PAC) test screen of 1.0. Changing to the PAC as the primary screening test can alter the measures allowed to compete for economic potential due to differences in incentives and incremental costs. Administrative costs are included in both cost tests. In the total resource cost (TRC) test, incremental measure costs are in the denominator, while in the PAC, incentives replace incremental costs. The economic potential with a PAC screen is close to that with a TRC screen for both sectors (103% for residential, and 107% for BNI in 2021). This result indicates that measures screen similarly between the two tests, with slightly more measures screening under the PAC test.

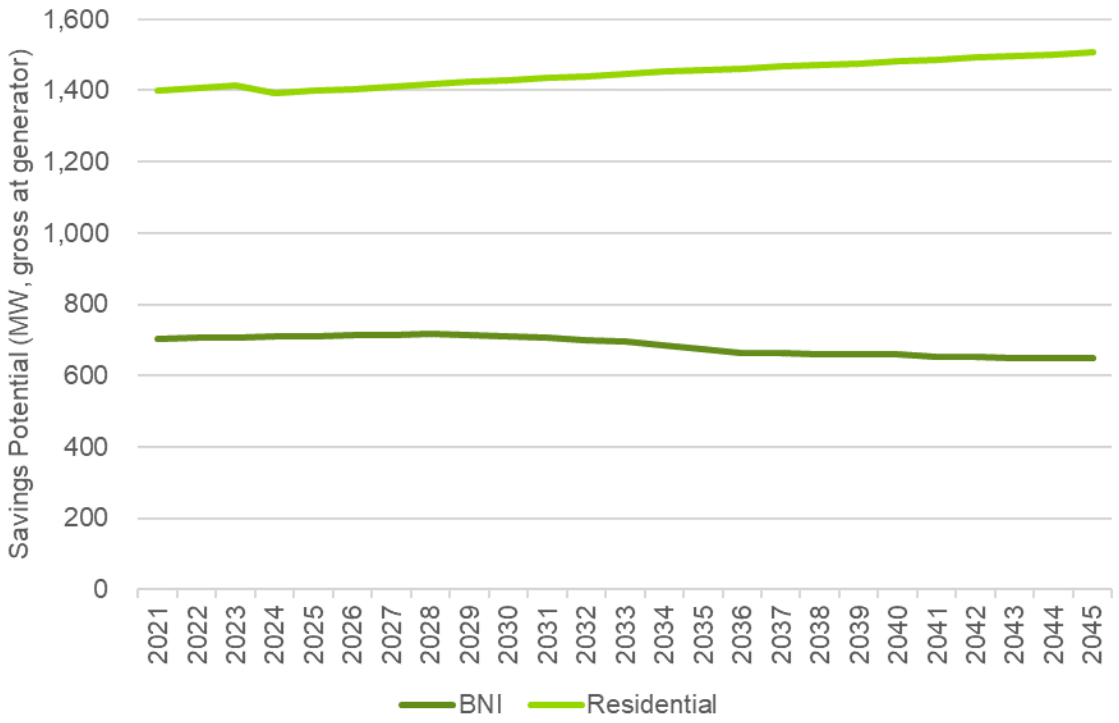
Figure 5-3. EE Economic Potential, Electricity Savings by Sector, PAC Test Screen (GWh, gross at generator)



Source: Navigant analysis

Figure 5-4 presents the economic winter peak demand potential, gross at generator, in each of the sectors using a PAC cost test screen of 1.0. As with the electricity results, the economic potential with a PAC test screen is close to that using a TRC screen for both sectors (100% for residential, and 106% for BNI in 2021). This result indicates that the measures that screen under the PAC test have slightly higher demand to electricity savings ratios, and that cost effectiveness screening was not a major limiting factor for economic potential. This is further demonstrated by the similarity of the economic potential and the technical potential, as the vast majority of these 'technically' superior measures in each competition group also pass the TRC screen of 1.0.

Figure 5-4. EE Economic Potential, PAC Screen, Winter Peak Demand Savings by Sector (MW, gross at generator)

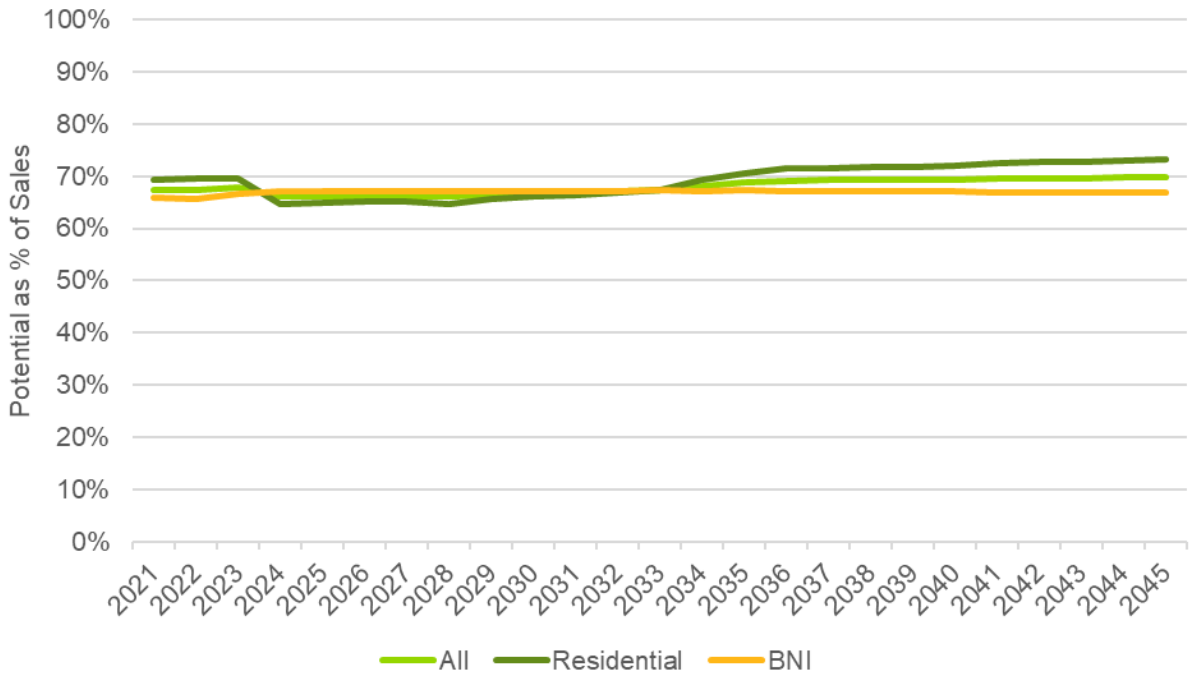


Source: Navigant analysis

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Figure 5-5 shows the economic electricity potential as a percentage of sales. BNI and Residential economic energy savings potential relative to sales in the respective sectors is very similar, suggesting similar opportunities for economic savings despite, for example, industrial processes which can be difficult to address through DSM programs. This emphasizes the relative importance of HVAC equipment potential and remaining potential in BNI lighting in Nova Scotia.

Figure 5-5. EE Economic Potential, Electricity Savings by Sector as a Percent of Sector Sales (%)

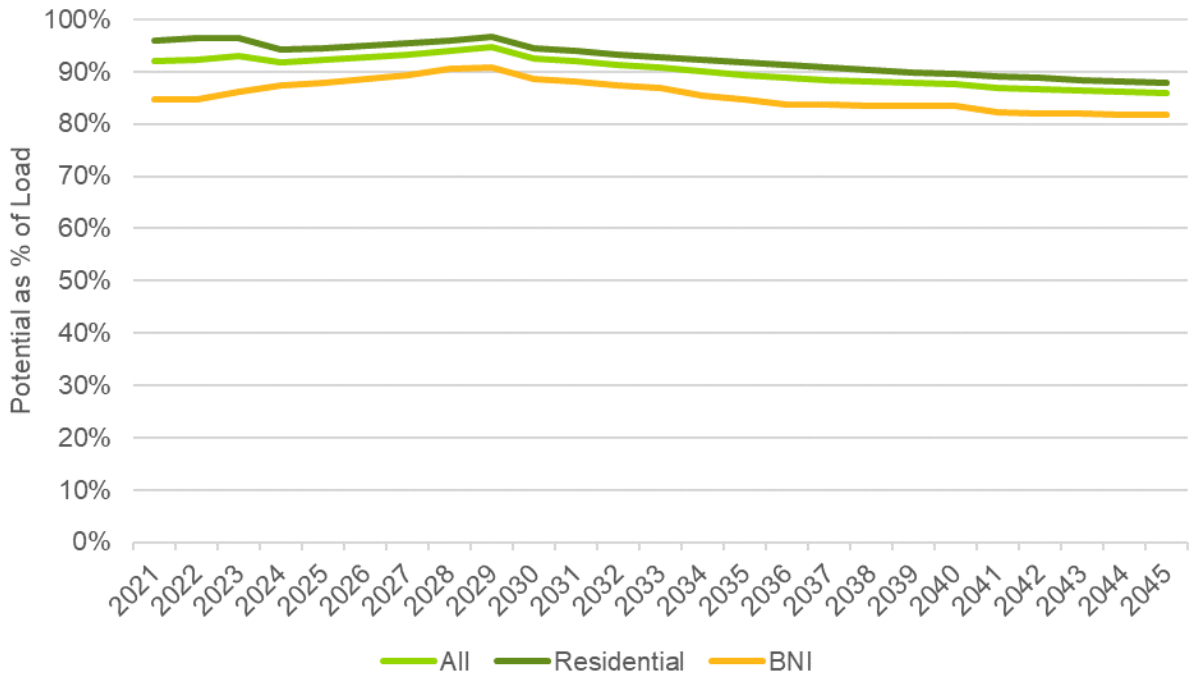


Source: Navigant analysis

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Figure 5-6 shows the economic winter peak demand potential as a percentage of consumption. Very similar trends to the economic electricity percent of sales are exhibited with demand. Percent of consumption is stable between 81% to 96% for all sectors. The economic potential as a percentage of consumption within the BNI sector also closely follows technical potential, as the vast majority of technical competition group winners (highest saving measures) have a TRC of more than 1.0. Similar to the electricity savings as a percent of sales above, this is in a large part due to fuel switching potential in HVAC. In the residential sector this is also due to differences in the line loss factors used for the total load (6.7%) and the potential (14.7%) as discussed in section 4.2.

Figure 5-6. EE Economic Potential, Winter Peak Demand Savings by Sector as a Percent of Load (%)



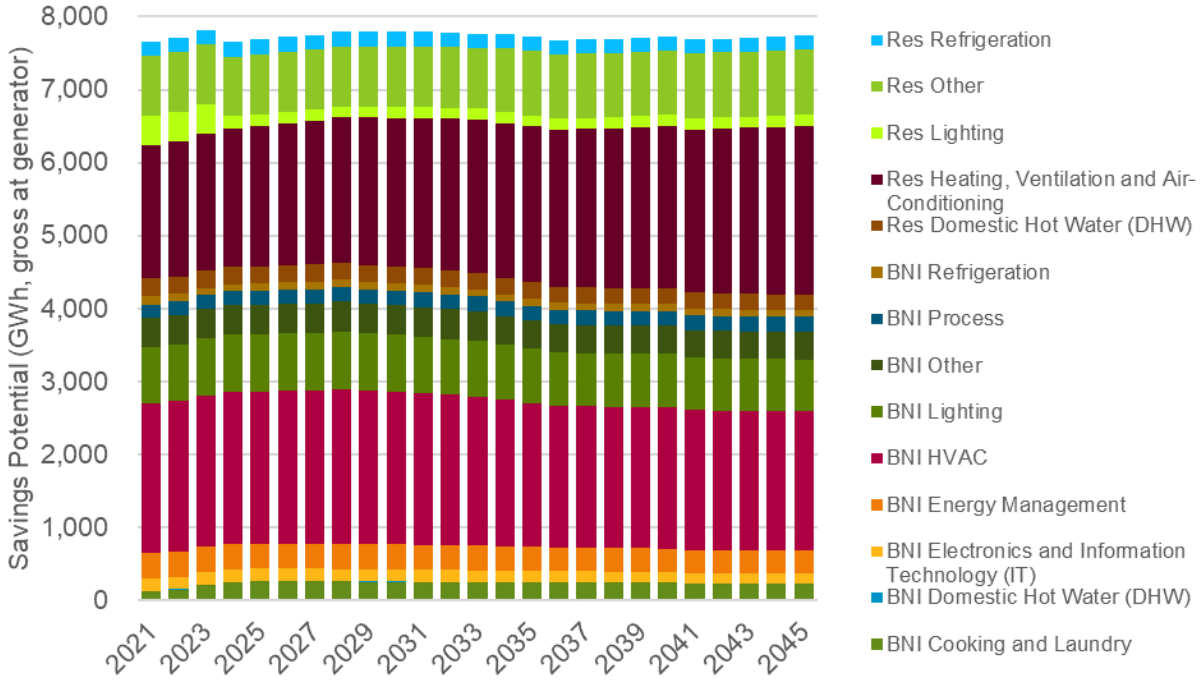
Source: Navigant analysis

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5.3 Energy Efficiency Economic Potential Results by End Use

Figure 5-7 shows the economic electricity potential, gross at generator, by end use for both BNI and Residential. HVAC potential stands out for both sectors as an area with large economic savings opportunities, and unlike general service lighting, there are no large codes or standards that are expected to be rolled out in the study horizon to limit this potential. Aside from lighting and HVAC, Res Other, which includes plug loads and most appliances, shows high potential savings due mostly to Wi-Fi enabled plugs, which are commercially available, but currently at very low penetrations.

Figure 5-7. EE Economic Potential, Electricity Savings by End Use (GWh, gross at generator)

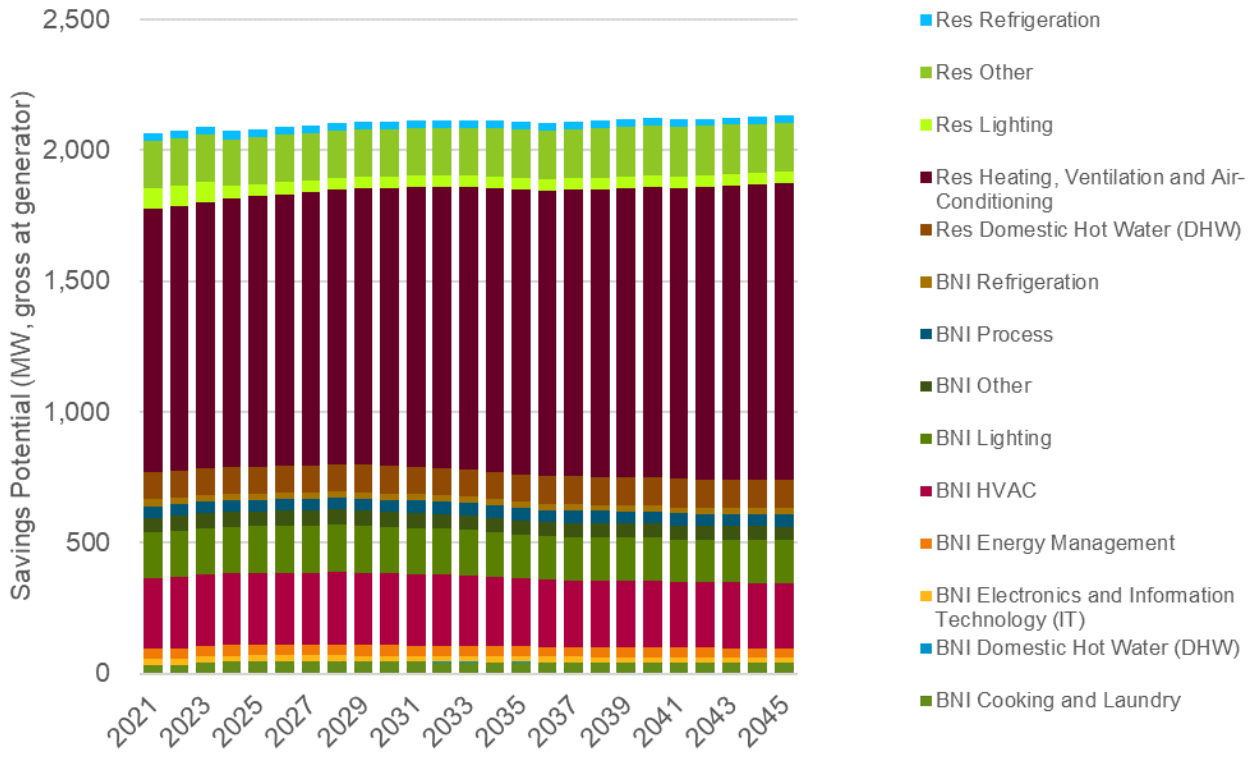


Source: Navigant analysis

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Figure 5-8 shows the economic winter peak demand potential, gross at generator, by end use, which is dominated by Res HVAC for both sectors and BNI lighting. This is largely due to res HVAC competition group measures reducing HVAC equipment demand entirely though fuel switching and high peak coincidence of BNI lighting technologies.

Figure 5-8. EE Economic Potential, Winter Peak Demand Savings by End Use (MW, gross at generator)

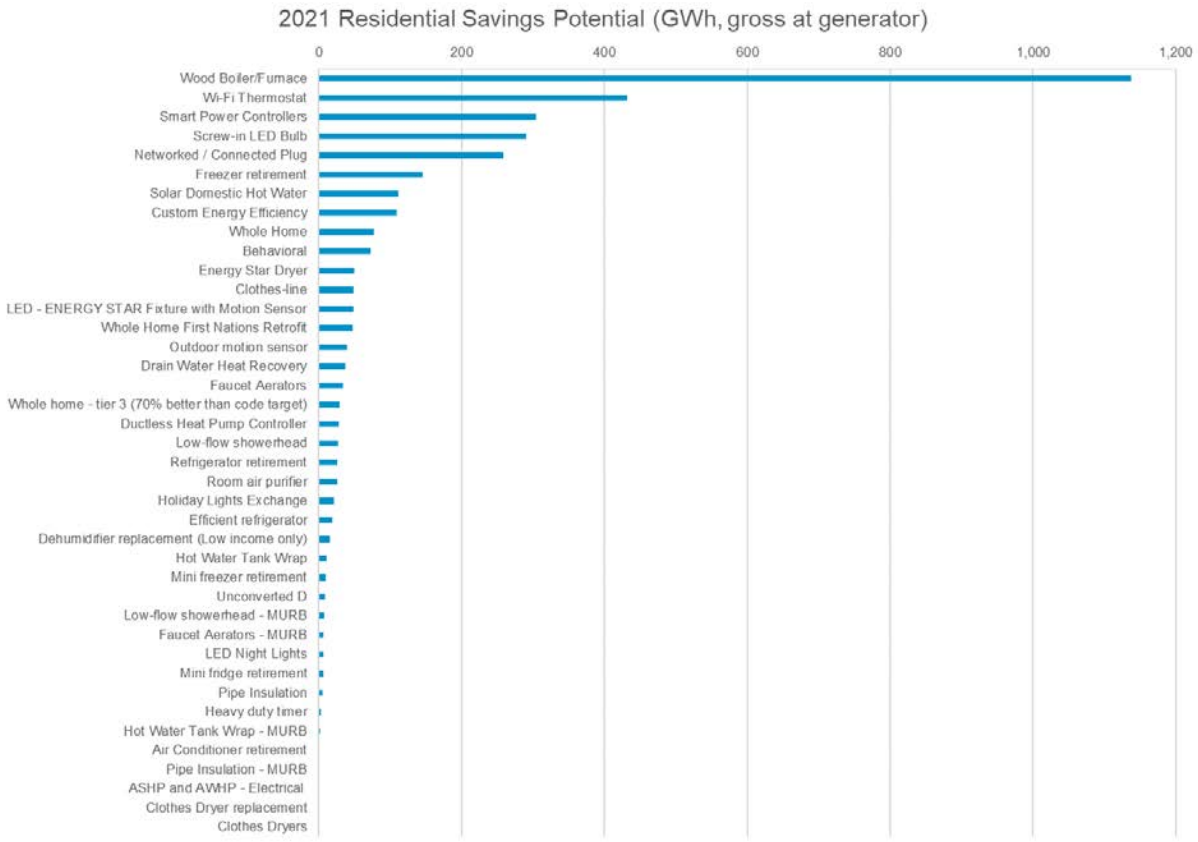


Source: Navigant analysis

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The measure-level economic energy savings potential in 2021, gross at generator, shown in Figure 5-9 and Figure 5-10 are after adjustments made to competition groups as detailed in section 3.2.4. The figures highlight the economic potential from the top 40 highest energy-savings measures for each sector. When compared with technical potential, only a few measures have dropped out – most notably Residential Networked/ Connected - Indoor LED Lamps and Residential Ventless Heat Pump Dryers do not screen at a TRC >= 1.0 threshold, and thus drop out of the economic potential top 40. As discussed earlier, most technical potential is economically achievable (i.e., passes a TRC test of 1.0). Therefore, the measure mix of the top 10 measures is largely the same as the technical potential results for both sectors.

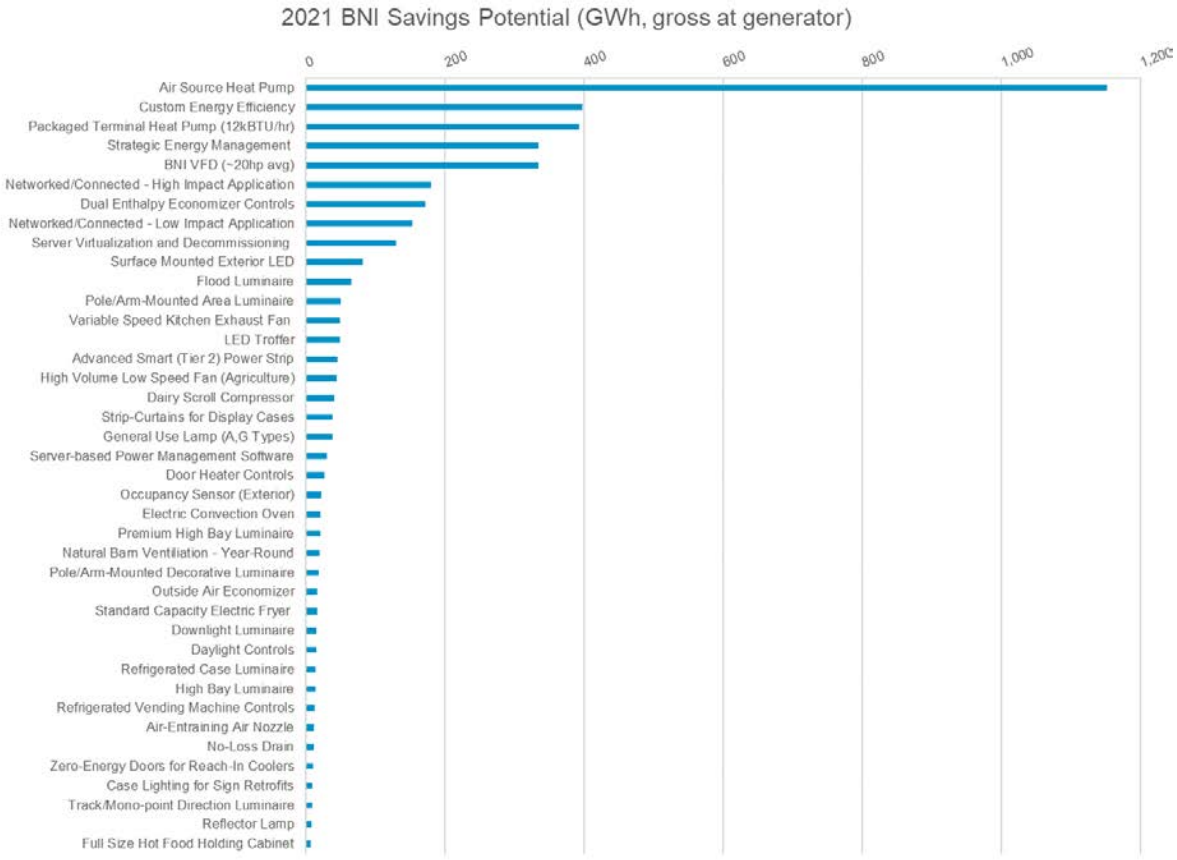
Figure 5-9. EE Economic Potential, 2021 Top 40 Residential Measures for Electricity Savings (GWh, gross at generator)



Source: Navigant analysis

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Figure 5-10. EE Economic Potential, 2021 Top 40 BNI Measures for Electricity Savings (GWh, gross at generator)

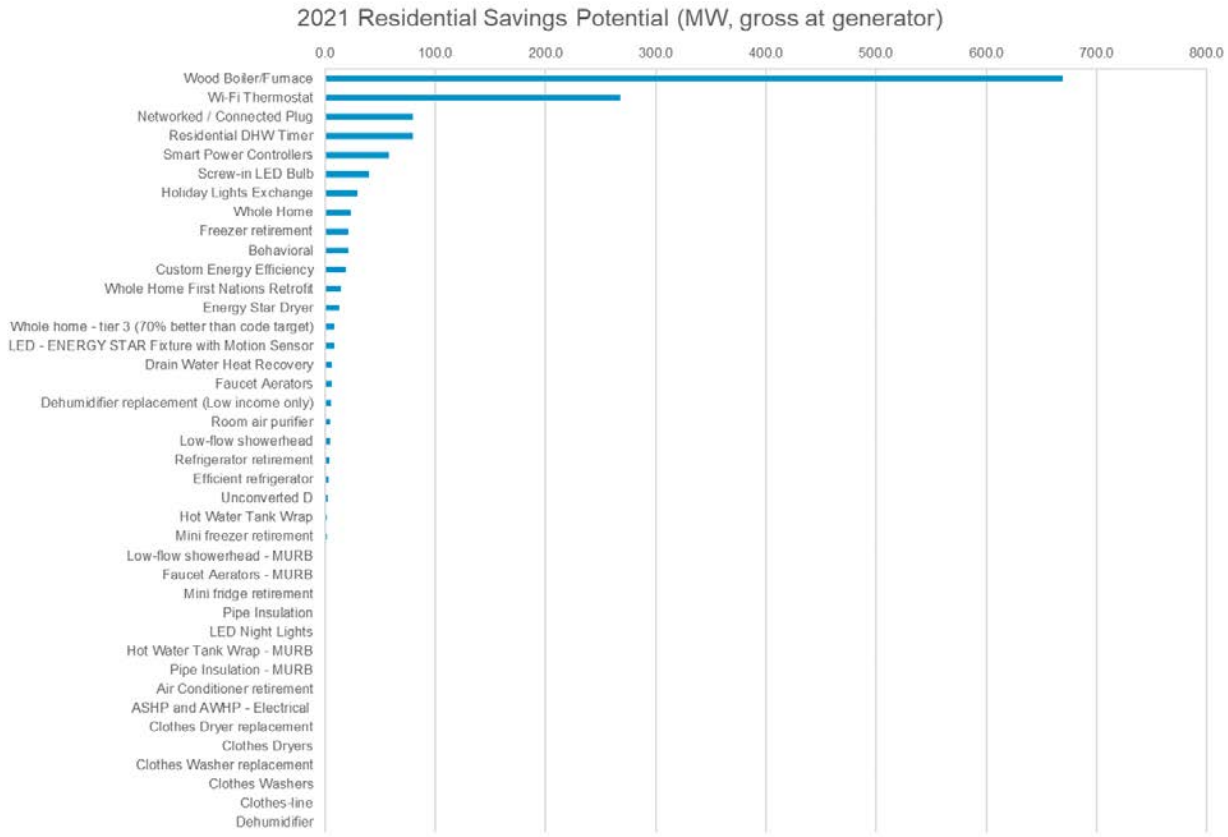


Source: Navigant analysis

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Figure 5-11 and Figure 5-12 provide the 40 highest winter peak demand-saving measures regarding economic potential for residential and BNI, gross at generator, in 2021. Compared with the technical potential results, only a few large measures drop out of the highest 20 measures: Residential Tier 3 Whole Home, Networked/ Connected - Indoor LED Lamp, and Heat Pump Water Heaters. As discussed earlier, most technical potential is economically achievable, passes a TRC test of 1.0. Therefore, the measure mix of top 10 to 20 measures is largely the same as the technical potential results for both sectors.

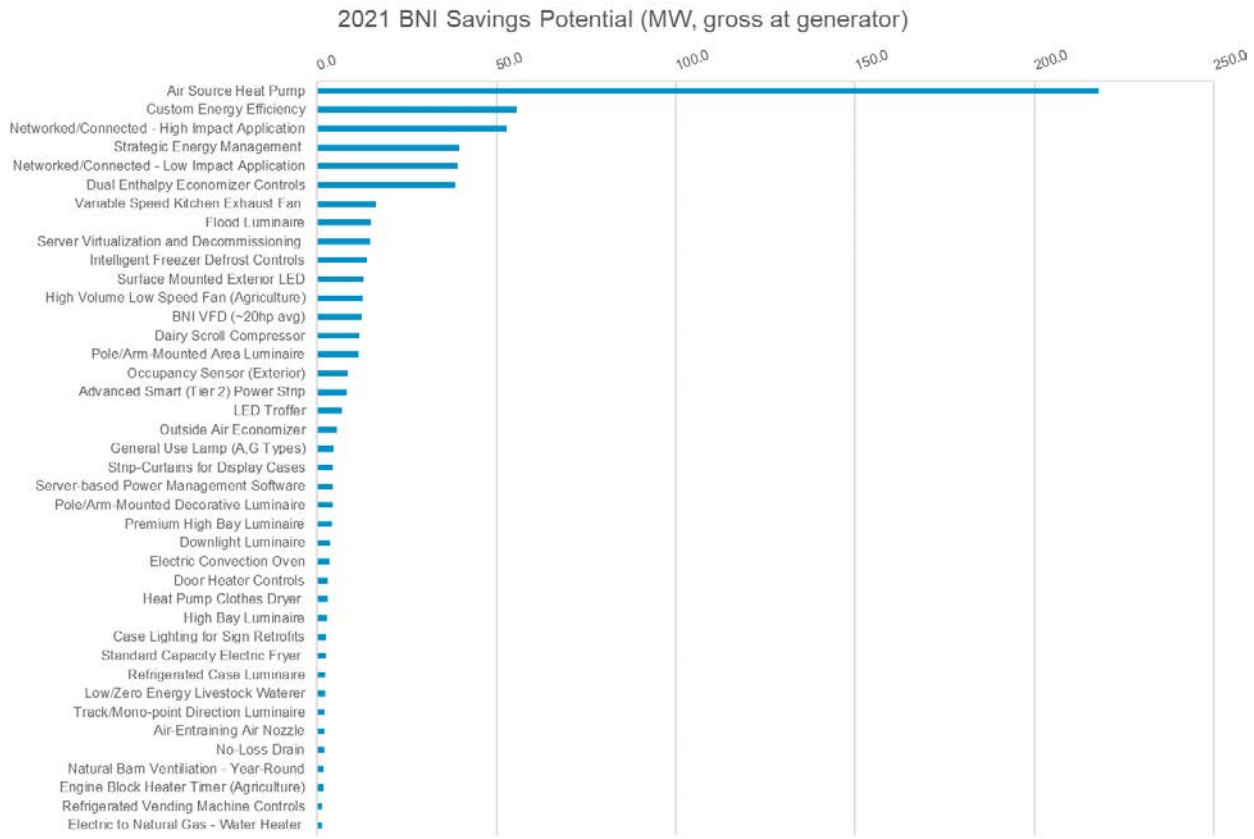
Figure 5-11. EE Economic Potential, 2021 Top Residential 40 Measures for Winter Peak Demand Savings (MW, gross at generator)



Source: Navigant analysis

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Figure 5-12. EE Economic Potential, 2021 Top BNI 40 Measures for Winter Peak Demand Savings (MW, gross at generator)



Source: Navigant analysis

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6. ENERGY EFFICIENCY MARKET POTENTIAL APPROACHES

Market potential further considers the likely rate of demand-side management (DSM) resource acquisition, given factors like the rate of equipment turnover (a function of a measure's lifetime), simulated incentive levels, consumer willingness to adopt efficient technologies, word of mouth effects that increase awareness in customers, and the likely rate at which marketing activities can facilitate technology adoption. The adoption of DSM measures can be broken down into calculation of the "equilibrium" market share and calculation of the dynamic approach to equilibrium market share, as discussed in more detail below.

Market potential differs from program potential in that market potential does not specifically take into account the various delivery mechanisms that can be used by program managers to tailor their approach depending on the specific measure or market. Rather, market potential represents a high-level assessment of savings that could be achieved over time, factoring in broader assumptions about customer acceptance and adoption rates that are not dependent on a particular program design. Additional effort is typically undertaken by program designers, using the directional guidance from a market potential study, to develop detailed plans for delivering energy efficiency programs. Market potential in this report relies on a Total Resource Cost (TRC) measure screen for cost effectiveness, with the threshold set at TRC of 0.7, intended to reflect Nova Scotia regulatory practice of screening at the program level.

Figure 6-1 summarizes the key methodology considerations and decision points informing the analysis in this report, with more detail provided in the report sections noted in the right-hand column of the figure. Navigant decided upon this methodology through discussions with EfficiencyOne and the DSM Advisory Group about which approach best serves the objective of the study to understand market savings potential. Since this study's scope for market potential estimates are not intended to be program-specific and are most reasonable when results are considered in aggregate, the methodology presented here focuses primarily on portfolio-level or sector-level approaches.

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Figure 6-1. EE Market Potential Methodology Overview

Methodology Parameters	Approach
Benefit-cost test screen	Use the TRC as the primary screen for economic and market potential.
Diffusion parameters	Adjust diffusion parameters within ranges recommended by industry standard data sources to produce savings that are reasonably aligned with EfficiencyOne's DSM sector-level historical achievements.
Budget constraints	Do not apply budget constraints.
Incentive strategy	Set incentive levels to yield a desired customer payback time (years) by end use and sector.
Treatment of administrative costs	Include measure level variable administrative costs that scale per kWh saved, and fixed admin at the portfolio level, that does not scale with kWh saved.
Net-to-Gross (NTG)	Market potential estimates are developed using net savings based on historical program NTG values.
Re-participation	Assume 85% of measures re-participate as an efficient measure at the end of their measure life.
Codes and standards	Use the same assumptions about codes and standards as in technical and economic potential.

6.1 Calculation of "Equilibrium" Market Share

The equilibrium market share can be thought of as the percentage of individuals choosing to purchase a technology provided those individuals are fully aware of the technology and its relative merits (e.g., the energy- and cost-saving features of the technology). For DSM measures, a key differentiating factor between the base technology and the efficient technology is the energy and cost savings associated with the efficient technology. Of course, that additional efficiency often comes at a premium in initial cost. This study calculates an equilibrium market share as a function of the payback time of the efficient technology relative to the baseline technology. In effect, measures with more favourable customer payback times after incentives will have higher equilibrium market share, which reflects consumers' economically rational decision making. While such approaches certainly have limitations, they are nonetheless directionally reasonable and simple enough to permit estimation of market share for the hundreds of technologies appearing in most potential studies.

To inform this study, the team used equilibrium "payback acceptance" curves that Navigant developed using primary research from the 2019 Nova Scotia Baseline Study (see Appendix B). To develop these curves, Navigant relied on surveys of 1000 residential and 200 BNI customers. These surveys presented decision makers with numerous "choices" between technologies with low up-front costs, but high annual energy costs, and measures with higher up-front costs but lower annual energy costs. Navigant fitted generalized logit models to customer willingness to pay survey results by technology cost bin and sector to develop the set of curves, which Navigant used in this study.

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As the curves show, the proportion of customers who will accept different payback periods for an energy efficiency investment is different for residential and BNI customers.[10] The model uses this information to simulate how customers in each sector will accept measures with differing payback periods.

Since the payback time of a technology can change over time, as technology costs and/or energy costs change over time, the "equilibrium" market share can also change over time. The equilibrium market share is therefore recalculated for every year of the forecast to ensure the dynamics of technology adoption take this effect into consideration. As such, "equilibrium" market share is a bit of an oversimplification and a misnomer, as it can itself change over time and is therefore never truly in equilibrium, but it is used nonetheless to facilitate understanding of the approach.

6.2 Calculation of the Approach to Equilibrium Market Share

Two approaches are used for calculating the approach to equilibrium market share, one for technologies being modeled as retrofit (RET) measures, and one for technologies simulated as replace-on-burnout (ROB) or new construction (NEW) measures.[11] The *Modelling Plan for Nova Scotia Energy Efficiency and Demand Response Potential Studies* (see Appendix A) discusses the approach to equilibrium market share in more detail.

6.3 Behavioural Measures

Behaviour measures typically impose little to no direct costs to the participant[12] and their rate of adoption is highly dependent on the marketing and incentive efforts taken by program administrators. Given these unique characteristics of behaviour measures, the payback acceptance curves and technology diffusion models have limited applicability to these types of measures. As such, this study models the adoption of behaviour measures in terms of an equilibrium saturation level relative to economic potential, and a given amount of time to reach that equilibrium state. Equilibrium saturation levels were derived from Navigant's review of mature behavioral programs in North America.

6.4 Energy Efficiency Investment Strategy

EfficiencyOne elected to view market potential without imposing any explicit budget constraints on the simulated results. The implication of this decision is that market potential is only constrained by stock turnover and customer willingness to adopt efficient measures. Without future budget constraints, the program administrator spending falls out naturally from the input assumptions for per-unit-of-savings incentive and administrative costs and a given year's level of market savings, without tying spending to a given budget level. In this study, the per-unit-of-savings incentive and administrative spending levels are fixed at the same levels (in real dollars, compared with nominal dollars) over the study horizon. Therefore, changes in spending (in real dollars) only reflect a changing mix and magnitude of savings among measures. Importantly, Navigant broke out administrative spending into variable and fixed components according to guidance from EfficiencyOne. Fixed administrative spending was specified at the portfolio level, and thus was not allocated back down to measures or sectors for cost effectiveness or net benefits calculations, but was included in total portfolio spending, cost effectiveness, and net benefits calculations.

[10] These payback curves represent customer payback acceptance in aggregate across each sector. In practice, customer behaviour can vary across sub-sectors. However, there is minimal industry-wide data available on customer payback acceptance at the sub-sector level.

[11] Each of these approaches can be better understood by visiting Navigant's technology diffusion simulator, available at: http://forio.com/simulate/navigantsimulations/technology-diffusion-simulation.

[12] Participants may incur indirect costs through implementation of adjustments to typical operations in response to energy information feedback (e.g., through upgrading a water heater). However, estimating these indirect costs requires additional data on the actions taken by the participant beyond participating in the behavioural program and is beyond the scope of this analysis.

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6.5 Energy Efficiency Incentive Strategy

Per EfficiencyOne's guidance, and as discussed with the DSM Advisory Group, this study calculates measure-level incentives based on targeted payback basis. A targeted payback incentive represents the dollar amount provided for each measure that would reduce the customer's simple payback to a specified time (years). Since a single targeted payback is set for each sector and end use, the model bounds the actual incentive provided to each measure to be at least 10% of the incremental measure cost, and to not exceed more than 100% of the incremental measure cost.

6.6 Re-Participation

The model assumes that 85% of program participants re-adopt energy efficient measures after the end of the efficient measures' expected useful lifetimes. This implies that efficient measures generally do not revert to a minimum code or lower efficiency level. As such, the model's cost accounting incurs an incentive cost upon the initial conversion of a minimum code or lower efficiency measure to an efficient measure, but it does not incur incentive costs when replacing incumbent equipment that was already updated to efficient equipment during the study horizon. Thus, incremental savings are counted only for new program participants, and 85% of these savings are summed up year over year to represent cumulative potential. For the 15% of program participants that revert to the baseline after the effective useful life of the measure, this savings is removed from the cumulative potential to reflect the in-situ condition at each time-step.

Behaviour measures, such as home energy reports, are an exception to this approach. When a behaviour measure is re-adopted at the end of its expected useful lifetime, the incentives provided for those measures are added to total program administrator spending. The rationale is that similar savings opportunities provided by behaviour measures are only available with ongoing support and/or administration from the program administrator. Since ongoing program administrator support is required to achieve behaviour measure savings, the incentives provided to repeat adopters are incurred multiple times throughout the study horizon.

6.7 Energy Efficiency Model Calibration

Any model simulating *future* product adoption faces challenges with "calibration," as there is no future world against which one can compare simulated results to actual results. Engineering models, on the other hand, can often be calibrated to a higher degree of accuracy since simulated performance can be compared directly with performance of actual hardware. Unfortunately, DSM potential models do not have this luxury, and therefore must rely on other techniques to provide both the developer and the recipient of model results with a level of comfort that simulated results are reasonable. For this study, Navigant took a number of steps to ensure that forecast model results were reasonable, including:

- Identifying the subset of potential measures that were included in historic ENS program offerings in order to have a basis for comparison with historic program achievements.
- Ensuring similar trends and magnitudes between EfficiencyOne's historical sector and end use-level savings and simulated sector and end use-level savings from the measure subset in the model's base year. 2017 historical achievements were used in the calibration process as they represent the most recent available data.
- Detailed three-year (2016-2018) backcasting for a small subset of the most influential lighting measures in ENS programs – LED Troffers, Screw-in LEDs, and Linear Replacement Lamps.

Before making comparisons of model results to historic achievements, it was first necessary to identify the potential measures that were included in ENS historic program offerings. The simulated savings from this subset of potential measures became the basis for comparing modelled savings to historic savings during

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the calibration process. It is important to note that although the team calibrated to historical results for this subset of measures, the model's results for *total* market potential may significantly differ from EfficiencyOne's historically achieved program savings. This occurs because the study includes additional detailed three-year (2016-2018) backcasting for a small subset of the most influential lighting measures in ENS programs – LED Troffers, Screw-in LEDs, and Linear Replacement Lamps.

Before making comparisons of model results to historic achievements, it was first necessary to identify the potential measures that were included in ENS historic program offerings. The simulated savings from this subset of potential measures became the basis for comparing modelled savings to historic savings during the calibration process. It is important to note that although the team calibrated to historical results for this subset of measures, the model's results for *total* market potential may significantly differ from EfficiencyOne's historically achieved program savings. This occurs because the study includes additional measures that have historically not been included in programs, but may exclude certain historical measures as well. This discrepancy can cause calibrated base year potential to be lower or higher than historic program data.

To obtain close agreement with EfficiencyOne's historic savings across a wide variety of metrics, Navigant adjusted incentive levels, technology diffusion coefficients and payback acceptance curves. Calibration required an iterative process of modifying the aforementioned parameters until all goals of calibration were reasonably satisfied. For example, the marketing effectiveness parameters are the key lever for calibrating the magnitude of historic savings for each sector and end use combination, whereas the word-of-mouth parameter strongly influences how rapidly adoption and savings ramp up over time. Navigant varied these diffusion parameters within the commonly observed ranges until simulated savings were trending reasonably compared with historic savings at the sector level.

To summarize, the calibration process ensures that forecast potential is grounded against real-world data considering the many factors that determine likely adoption of DSM measures, including both economic and non-economic factors.

6.7.1 Detailed Backcasting

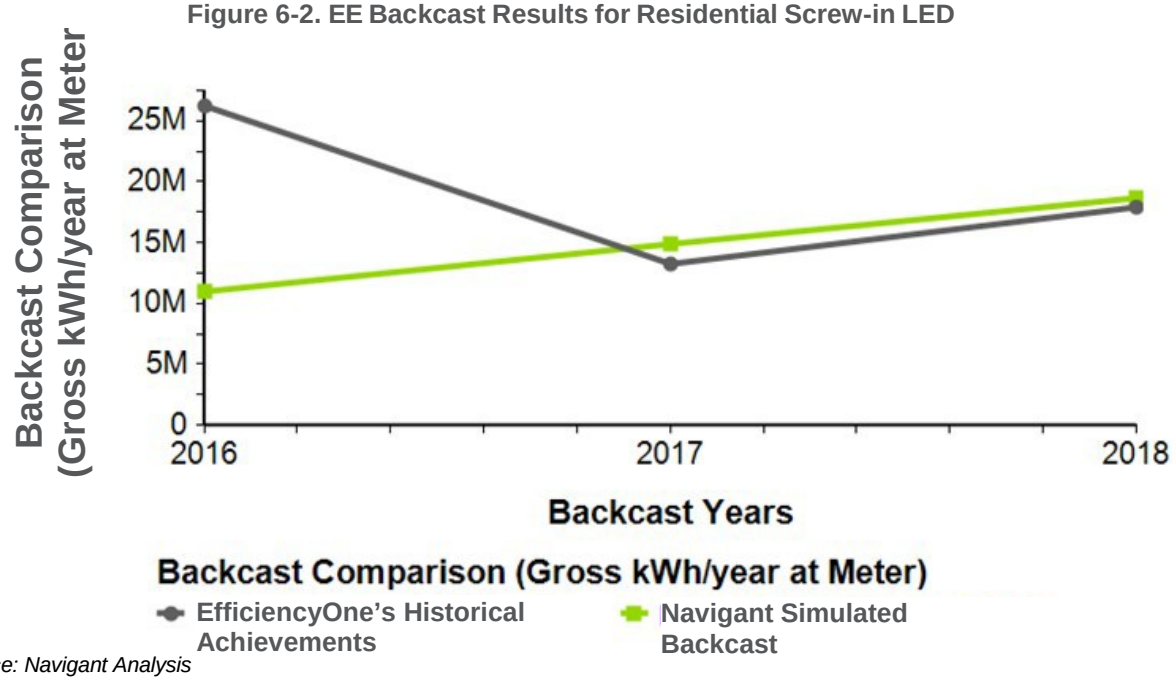
To further explore model validation, Navigant worked with EfficiencyOne to obtain three years of historic data on savings, units installed, and annual incentive levels for several high-impact measures: Screw-in LEDs for residential, and Linear Replacement Lamps and LED Troffers for BNI. In this exercise, Navigant used the DSMSim™ model to simulate adoption of these measures in the backcast period, feeding the model only information on available stocks, incentive levels, and estimated historical (2016) awareness. If the model accurately depicts the system that it attempts to simulate, results (Navigant Simulated Backcast) should be on the same order as actuals (EfficiencyOne's Historical Achievements).

It is worth noting that because DSMSim™ is a structural systems dynamics model, without regression or optimization routines to guarantee fitting, the results below represent the characterization of the system – structural limits on stock, the behavior of customers in response to price, and the role of awareness in technology adoption - rather than explicit best-fit parameter tuning. This result gives Navigant a high degree of confidence in the structure and function of the model and its applicability to energy efficiency technology adoption in Nova Scotia.

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Figure 6-2 shows the fit of the backcast simulation to residential screw-in LEDs. The model was not able to explain the high savings achieved in 2016, which were higher than 2017 levels despite a lower incentive. This could be due to a one-time marketing push, or factors exogenous to the model, such as local economic trends, or contractor activity. However, both 2017 and 2018, as well as the slope of these years demonstrates a strong fit, perhaps more characteristic of "normal" market conditions.

Figure 6-2. EE Backcast Results for Residential Screw-in LED

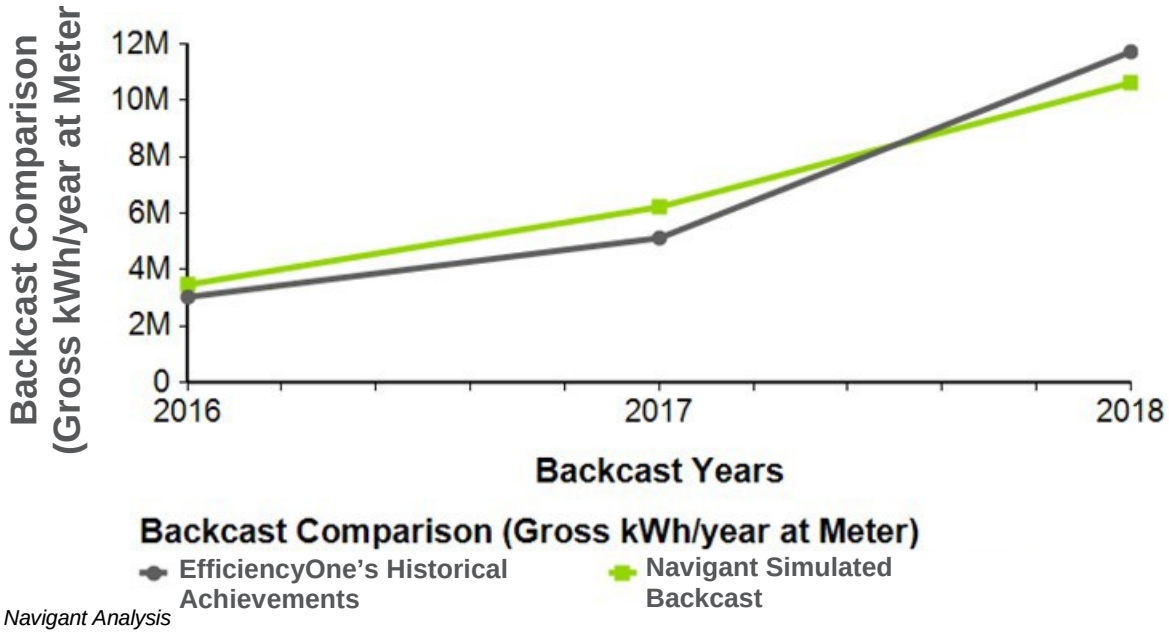


Source: Navigant Analysis

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Figure 6-3 shows the backcasting results for LED Troffers in the BNI sector, demonstrating a close fit in both the individual annual adoptions, and the overall trend. It is worth noting that the slope between 2017 and 2018 is slightly higher in the historical achievements, perhaps suggesting that there are minor non-economic factors that might cause the adoption of LED Troffers to be slightly higher than one would expect based on economics alone. However, due to the small size of this difference, and the uncertain attribution of this observation, Navigant did not attempt to model these non-economic effects in the potential study results.

Figure 6-3. EE Backcast Results for BNI LED Troffer

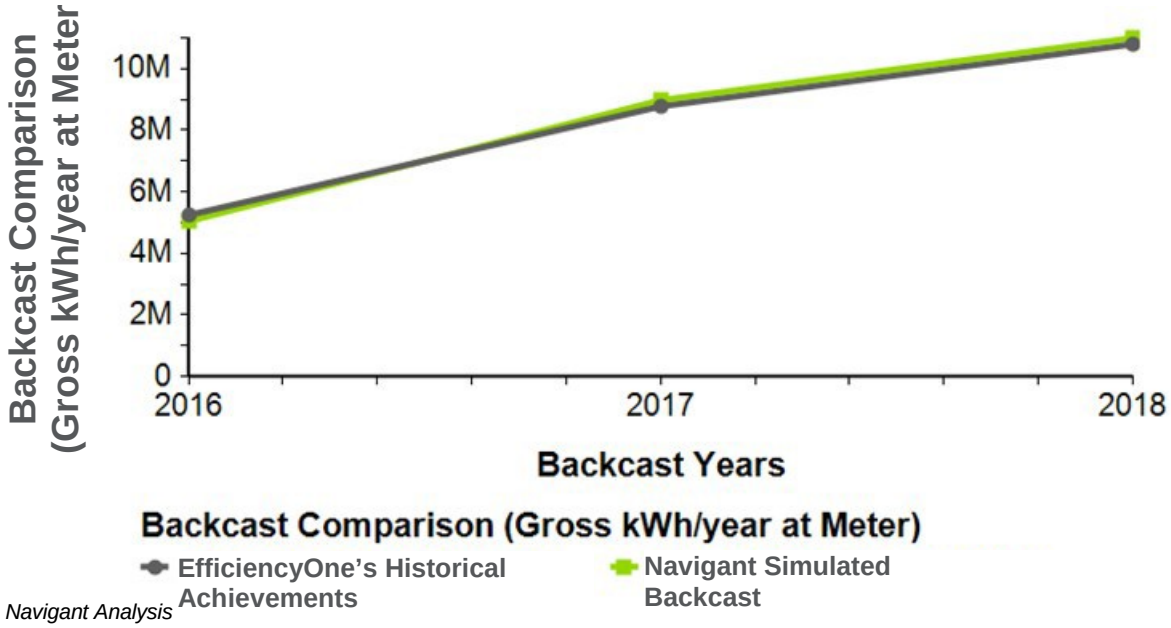


Source: Navigant Analysis

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Figure 6-4 shows the fit for BNI Linear Replacement Lamps during the backcasting period. Both the trajectory and the individual year estimates for the historical savings are quite good, with no noteworthy deviations. While Bass diffusion models are often used to simulate emerging technologies, one of the known features of Bass diffusion models is their ability to fit more mature markets (past the inflection point) with a high degree of confidence. Both the high penetration of these measures in Nova Scotia, and the historic trend, is indicative that BNI Linear Replacement Lamps are past the inflection point. In the absence of other factors, Nova Scotia can expect slower growth in these measures in the future as market saturation increases.

Figure 6-4. EE Backcast Results for BNI Linear Replacement Lamps



Source: Navigant Analysis

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7. REFERENCE FORECAST APPROACH

The reference scenario (base) was developed through the calibration process detailed in Section 5. The targeted paybacks used as the incentive strategy were set during this calibration and act as the basis for adjustments when developing alternative scenarios. Three alternative scenarios were developed through adjustments to targeted payback times, marketing effects, and administrative spending relative to the reference scenario. Administrative spending was increased or decreased according to the scenario change to the marketing coefficient. The four alternative scenarios' configurations are detailed below.

7.1 Scenario Configuration

Navigant developed three alternative achievable scenarios relative to the reference (Base Scenario). These four scenarios, in addition to the PAC test-based Economic potential, form the five scenarios discussed with the DSM Advisory Group.

- Max Achievable Scenario
  - Targeted Payback – 0 years for all measures
  - Marketing Effect – 200% of reference scenario at the sector and end use level
- Mid Scenario
  - Targeted Payback – Half of reference scenario at the sector and end use level
  - Marketing Effect – 150% of reference scenario at the sector and end use level
- Low Scenario
  - Targeted Payback – Double of reference scenario at the sector and end use level
  - Marketing Effect – 50% of reference scenario at the sector and end use level

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8. ENERGY EFFICIENCY MARKET POTENTIAL RESULTS BY SCENARIO

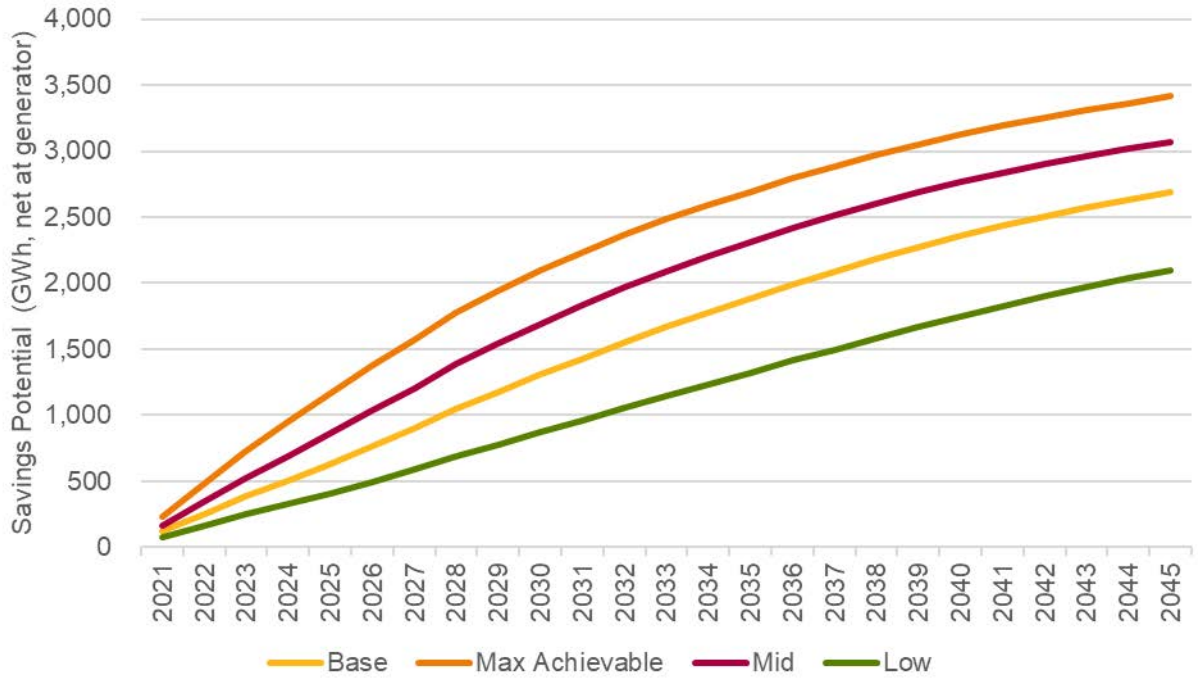
This section provides the market potential results calculated by the model at varying levels of aggregation, using the TRC benefit-cost test as a screen set to 0.7. At-the-meter, net savings results are shown by sector, end use category, and by highest-impact measures.

8.1 Comparison of Energy Efficiency Savings by Potential Type

Values shown below for market potential are termed "cumulative market" potential, in that these represent the accumulation of each year's annual incremental market potential (e.g., an annual incremental market potential of 0.8% per year for ten years would result in a cumulative market potential of 8.0% of forecast consumption if all efficient equipment had measure lives of at least ten years). It is important to note that as measures installed in earlier years reach the end of their effective useful lives (EUL), these are removed from the cumulative potential. It is then assumed that 85% reparticipate (get added back into potential with a reset EUL), while the remaining 15% are included in available stock for later adoption.

As shown in Figure 8-1, the cumulative market potential, net at generator, for each scenario, which accounts for the rate of DSM acquisition, increases steadily throughout the study period, reaching 2,100 GWh in 2045 for the low scenario and around 3,415 GWh in 2045 for the maximum achievable scenario. The base case reaches 2,690 GWh in 2045, which equates to 35% of the economic potential. The mid case reaches 3,070 GWh in 2045.

Figure 8-1. EE Market Potential, Cumulative Electricity Savings, by Scenario (GWh, net at generator)

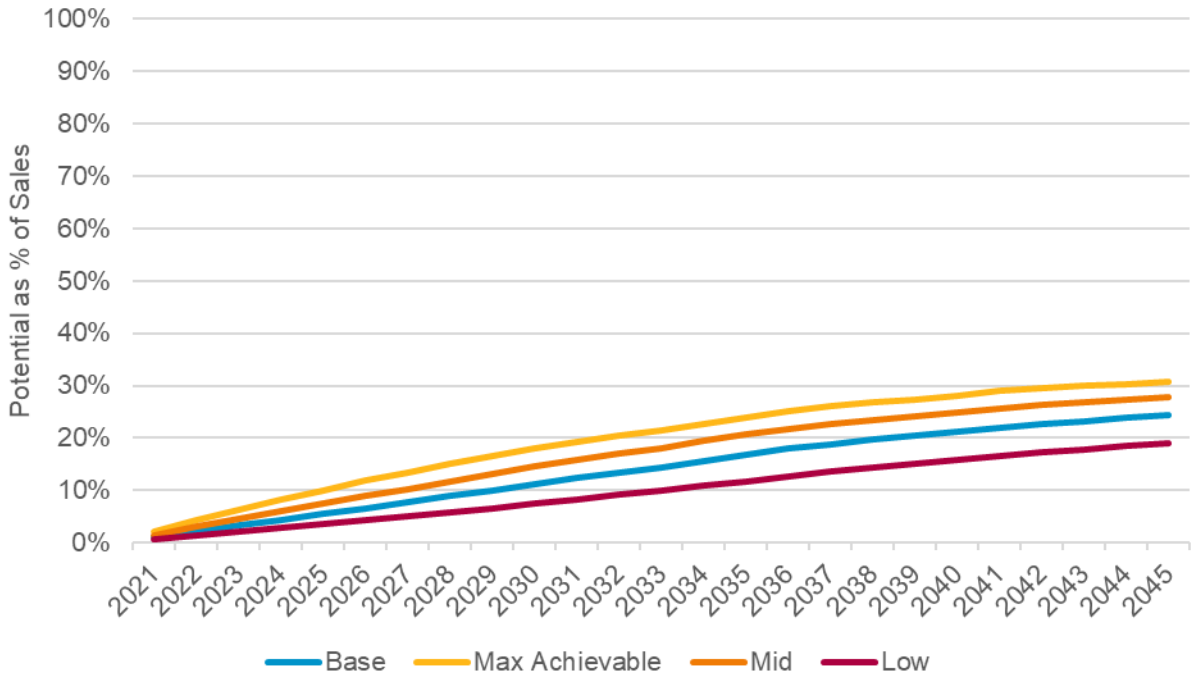


Source: Navigant analysis

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Under the cost effectiveness screen requiring each measure to meet or exceed a TRC ratio of 0.7, base scenario market potential increases from 1.1% in 2021 to 22.3% in 2045 of forecast electricity consumption, as shown in Figure 8-2. In 2045, the low, mid and maximum achievable scenarios cumulate to 19.0%, 27.7% and 30.8%, respectively.

Figure 8-2. EE Market Potential, Cumulative Electricity Savings, by Scenario, as a Percent of Sales (%)



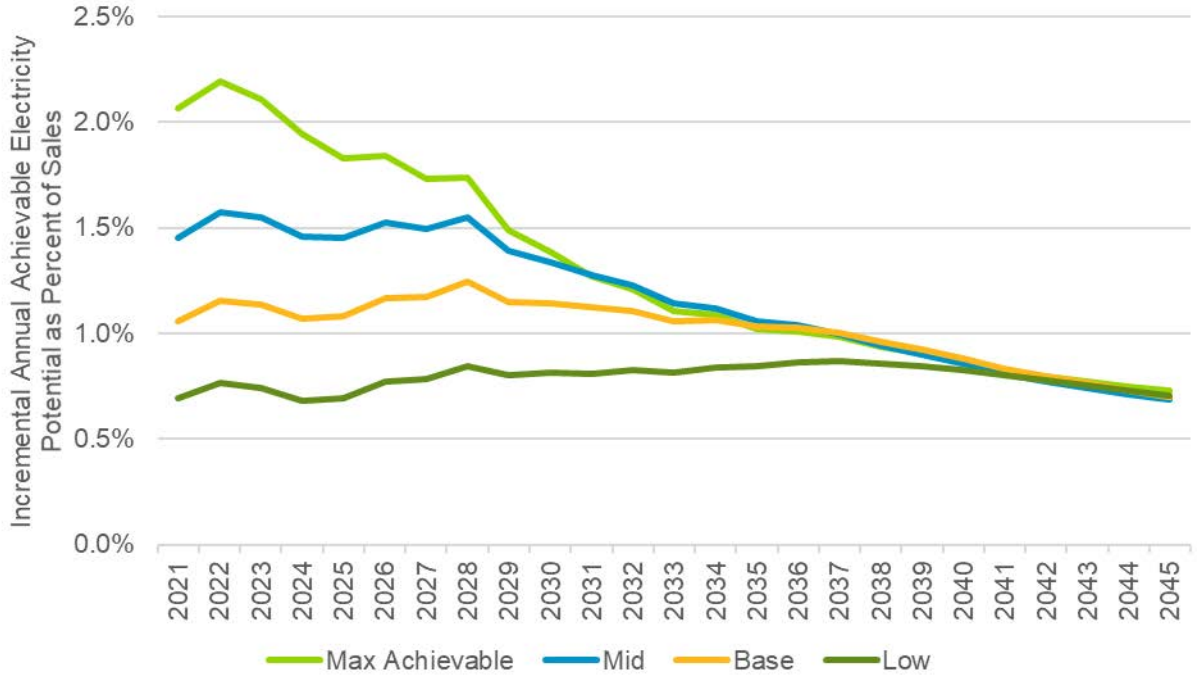
Source: Navigant analysis

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Figure 8-3 show incremental annual electricity savings as a percent of sales for each scenario. The base scenario achieves 1.1% of sales in 2021 and decreasing to 0.7% by 2045 with a maximum of 1.2% in 2029. Each scenario exhibits similar trends with initially high and growing incremental annual potential followed by reductions in potential through time. This downward slope is caused by efficient technology saturation in certain end uses—such as BNI lighting—and code and standard impacts.

The convergence of the scenarios' incremental percent of sales throughout the second half of the study period is due to the nature of the residential and BNI sector percent of sales. The residential sector shows significant saturation in the first 10 years of the study period for the maximum achievable and mid scenarios. Therefore, incremental annual potential crosses the lower (base and low cases) investment scenarios as those continue to gain market share at a slower rate. However, the commercial sector does not show this saturation therefore, the incremental annual potential stays constant in relation to each other through the study period. These trends cancel each other out when viewing the total portfolio incremental achievable. If the trends continue, the scenarios would likely diverge with maximum achievable being lower annually than the other scenarios after the 25-year study period.

Figure 8-3. EE Market Potential, Incremental Electricity Savings by Scenario, as a Percent of Sales (%)

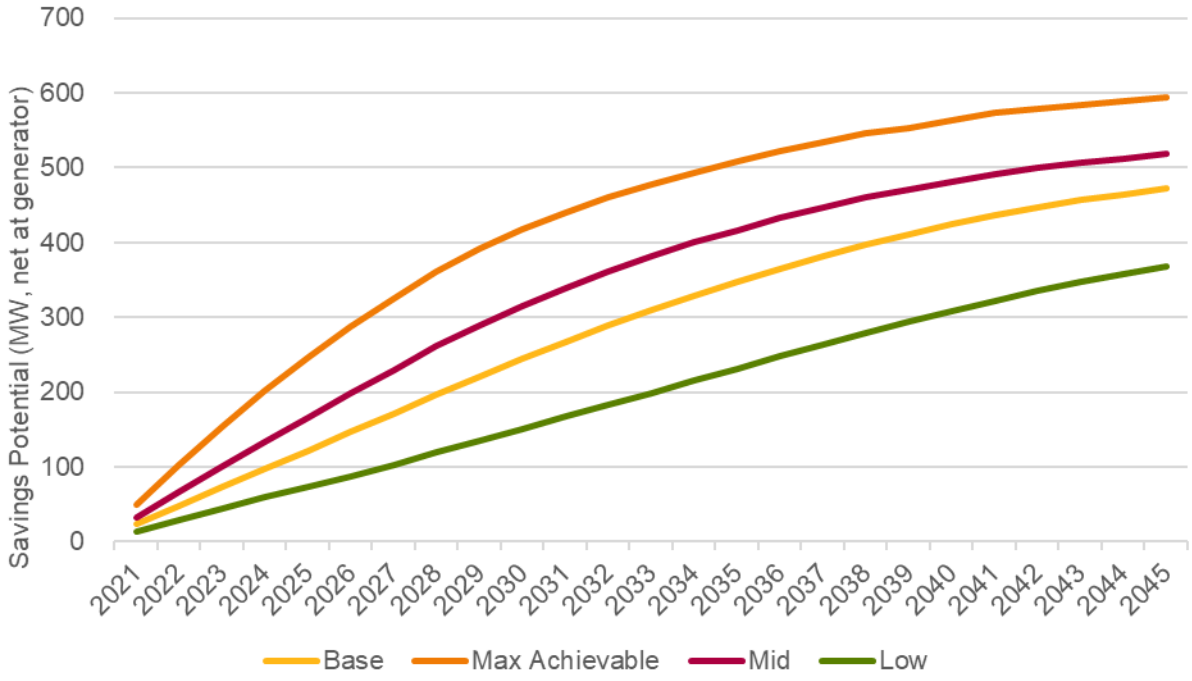


Source: Navigant analysis

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Figure 8-4 shows the cumulative winter peak demand potential, net at generator, by scenario. These demand savings are auxiliary impacts from the installation of energy efficiency measures, whereas the demand savings from demand-focused measures are estimated in a separate analysis on demand response potential. The market potential increases steadily throughout the study period for each scenario, reaching 470 MW in 2045 for the base scenario. By 2045, the base scenario market potential reaches 22% of the economic potential.

Figure 8-4. EE Market Potential, Cumulative Winter Peak Demand Savings (MW, net at generator)

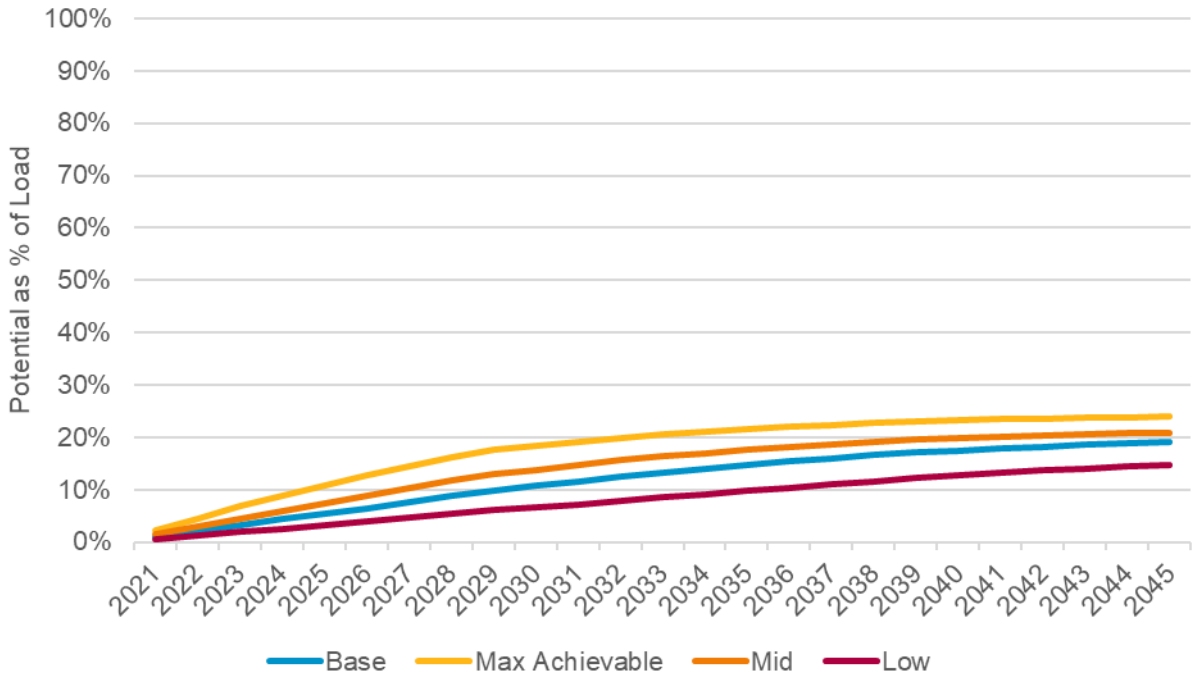


Source: Navigant analysis

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Figure 8-5 shows the cumulative winter peak demand potential by scenario as a percent of load. The base scenario cumulates to 1.0% in 2021 and 19.0% in 2045.

Figure 8-5. EE Market Potential, Cumulative Winter Peak Demand Savings, by Scenario, as a Percent of Load (%)

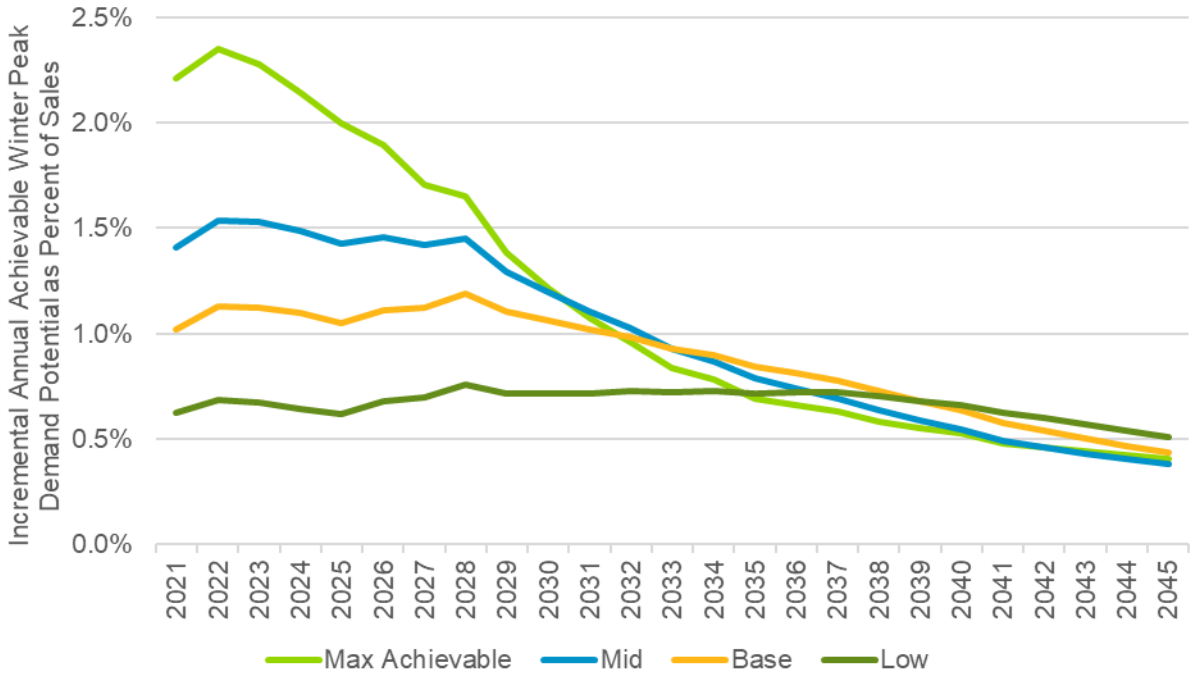


Source: Navigant analysis

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Figure 8-6 shows incremental winter peak demand savings by scenario as a percent of sales. The base scenario achieves 1.0% of consumption in 2021 and drops to 0.4% by 2045 with a peak of 1.2% in 2028. A similar trend is exhibited to incremental electricity potential with a downward trend through time. This is due to efficient technology saturation and costs and standards increases through time.

Figure 8-6. EE Market Potential, Incremental Winter Peak Demand Savings by Scenario, as a Percent of Load (%)



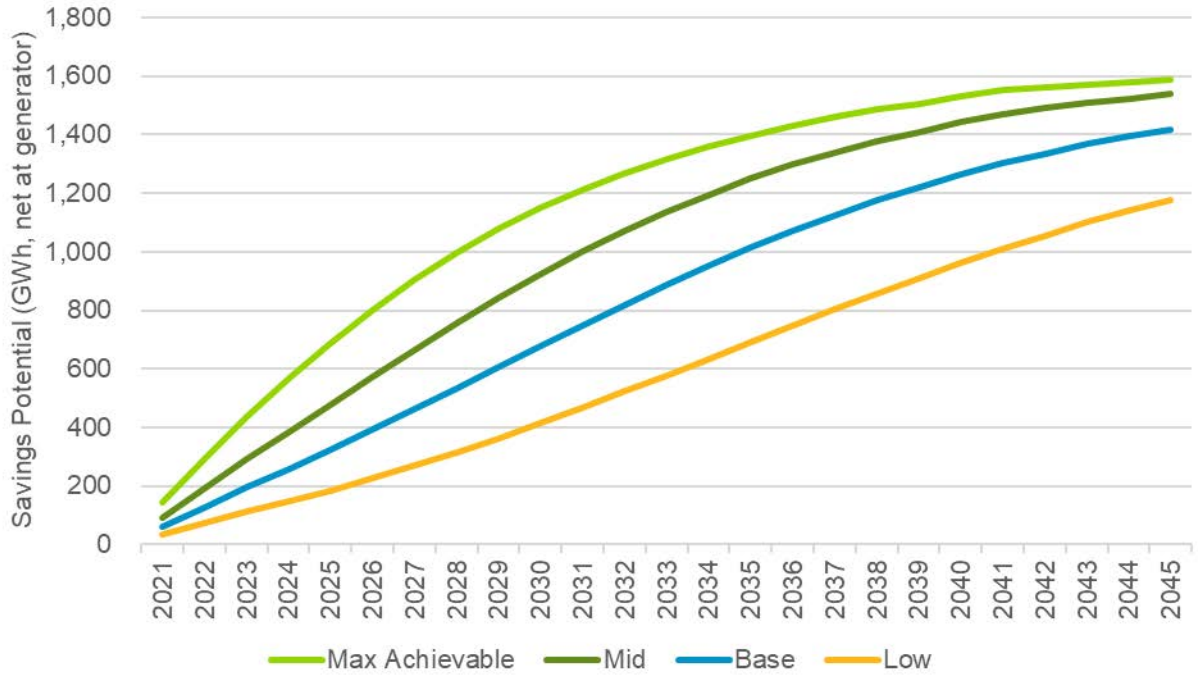
Source: Navigant analysis

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8.2 Energy Efficiency Potential Results by Sector

Figure 8-7 shows the magnitude of cumulative electricity market savings potential, net at generator, by scenario for the residential sector. The base case reaches 1,415 GWh in 2045. This represents 38% of economic potential in that year. In 2045, the low, mid and maximum achievable scenarios reach 1,175, 1,540 and 1,590 GWh, respectively.

Figure 8-7. EE Residential Market Potential, Cumulative Electricity Savings (GWh, net at generator)

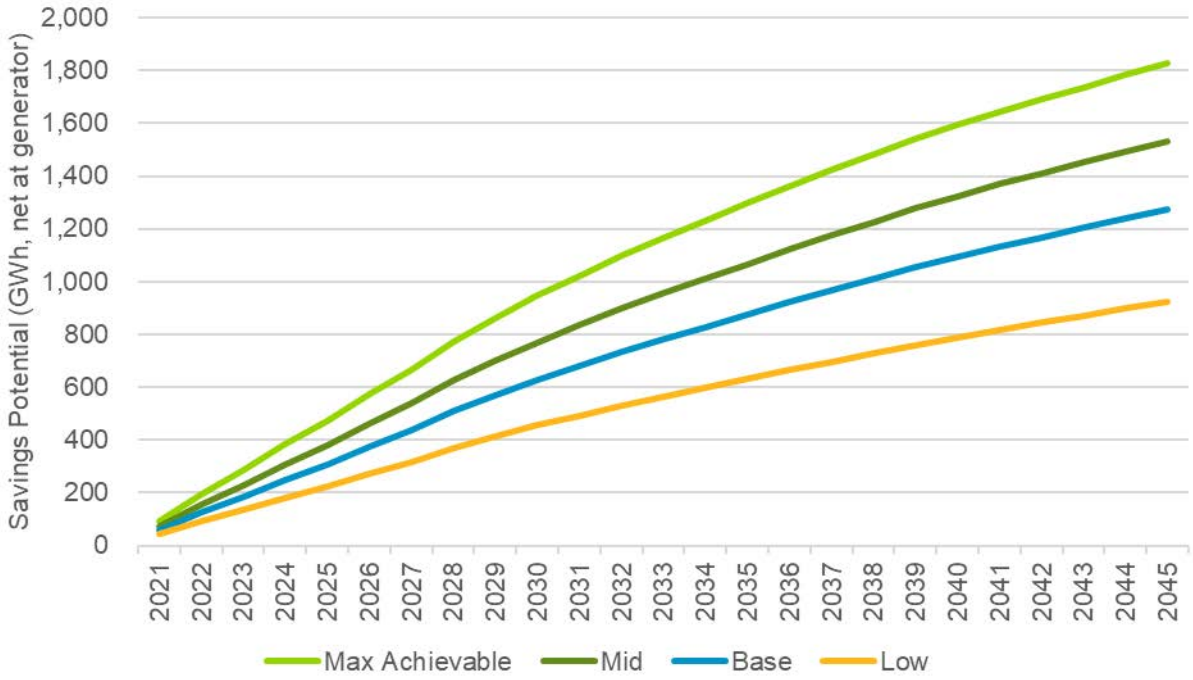


Source: Navigant analysis

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Figure 8-8 shows the magnitude of cumulative electricity market savings potential, net at generator, by scenario for the BNI sector. The base case reaches 1,275 GWh in 2045. This represents 32% of economic potential in that year. In 2045, the low, mid and maximum achievable scenarios reach 925, 1,530 and 1,825 GWh, respectively.

Figure 8-8. EE BNI Market Potential, Cumulative Electricity Savings (GWh, net at generator)

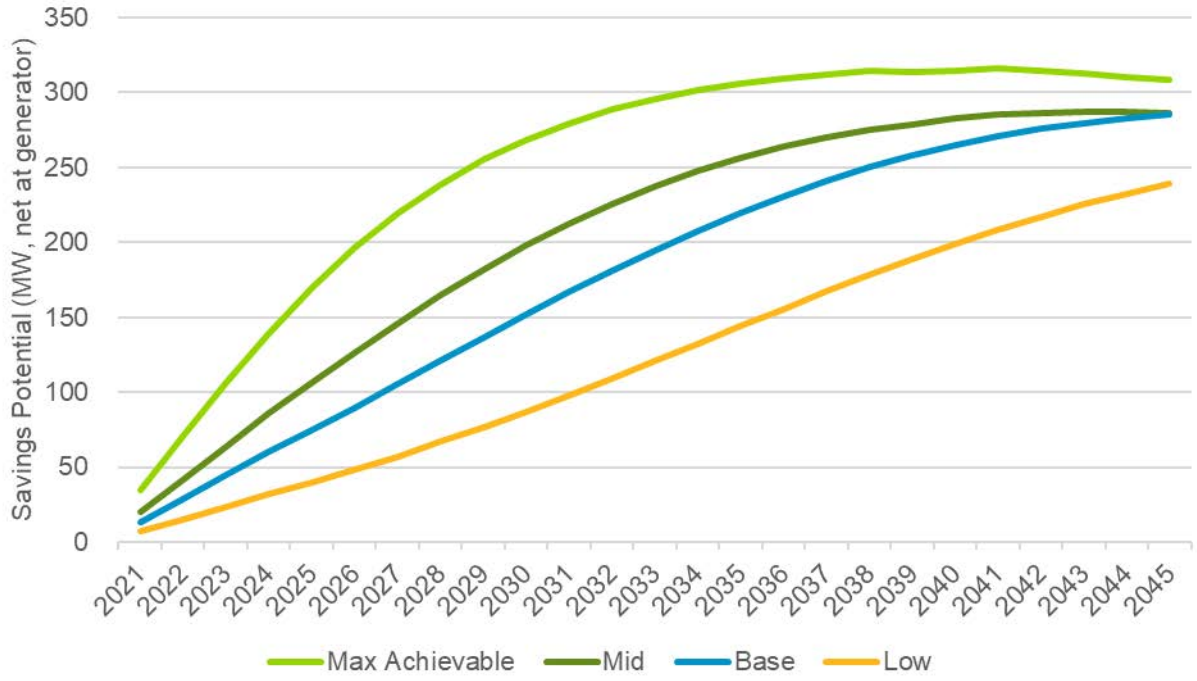


Source: Navigant analysis

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Figure 8-9 shows the magnitude of cumulative winter peak demand market savings potential, net at generator, by scenario for the residential sector. The base case reaches 285 MW in 2045. This represents 19% of economic potential in that year. In 2045, the low, mid and maximum achievable scenarios reach 240, 285 and 308 MW, respectively.

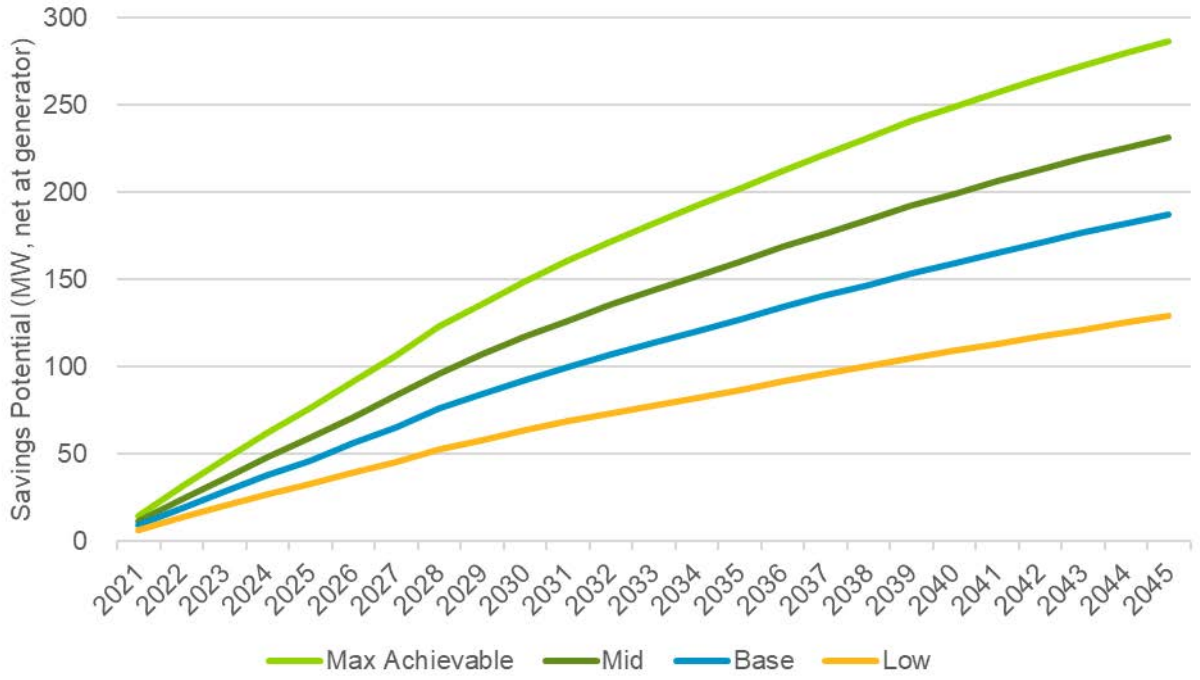
Figure 8-9. EE Residential Market Potential, Cumulative Winter Peak Demand Savings (MW, net at generator)



Source: Navigant analysis

Figure 8-10 shows the magnitude of cumulative winter peak demand market savings potential, net at generator, by scenario for the BNI sector. The base case reaches 185 MW in 2045. This represents 30% of economic potential in that year. In 2045, The low, mid and maximum achievable scenarios reach 130, 230 and 285 MW respectively.

Figure 8-10. EE BNI Market Potential, Cumulative Winter Peak Demand Savings (MW, net at generator)



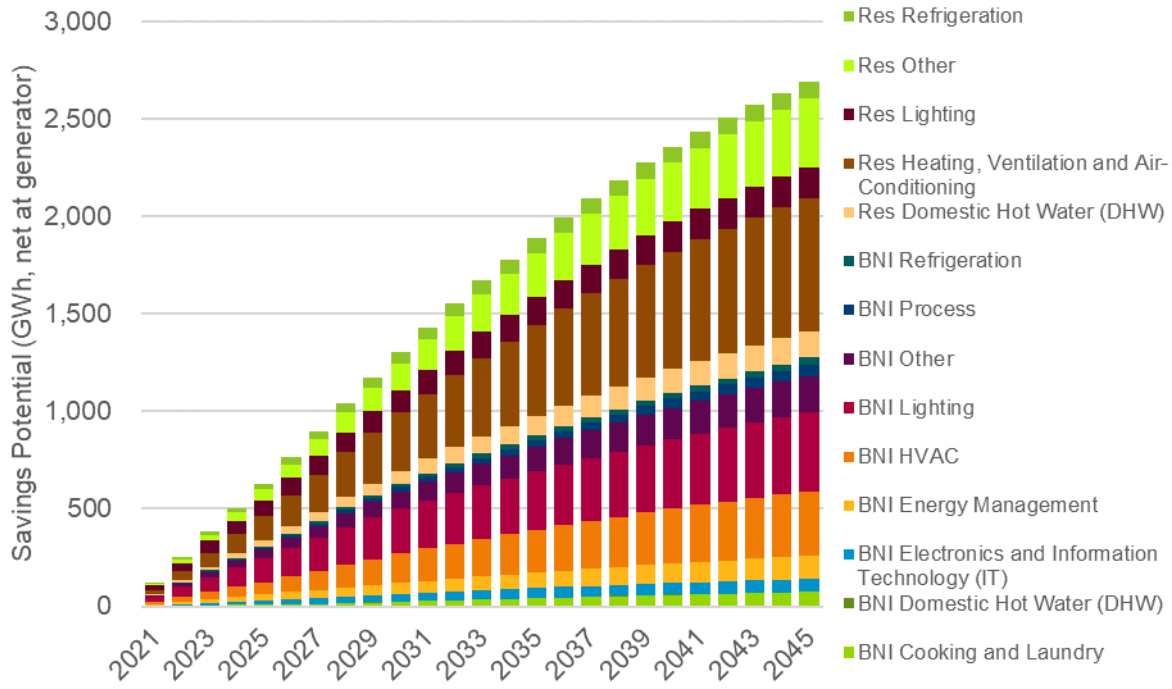
Source: Navigant analysis

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8.3 Energy Efficiency Potential Results by End Use

Figure 8-11 shows the electricity market savings potential, net at generator, across end uses. The dominant end uses are Res HVAC and BNI lighting. A wide variety of technologies add to the BNI lighting savings led by LED troffers and linear replacement lamps. Res HVAC is led by whole home retrofits.

Figure 8-11. EE Base Case Market Potential, Cumulative Electricity Savings by End Use (GWh, net at generator)

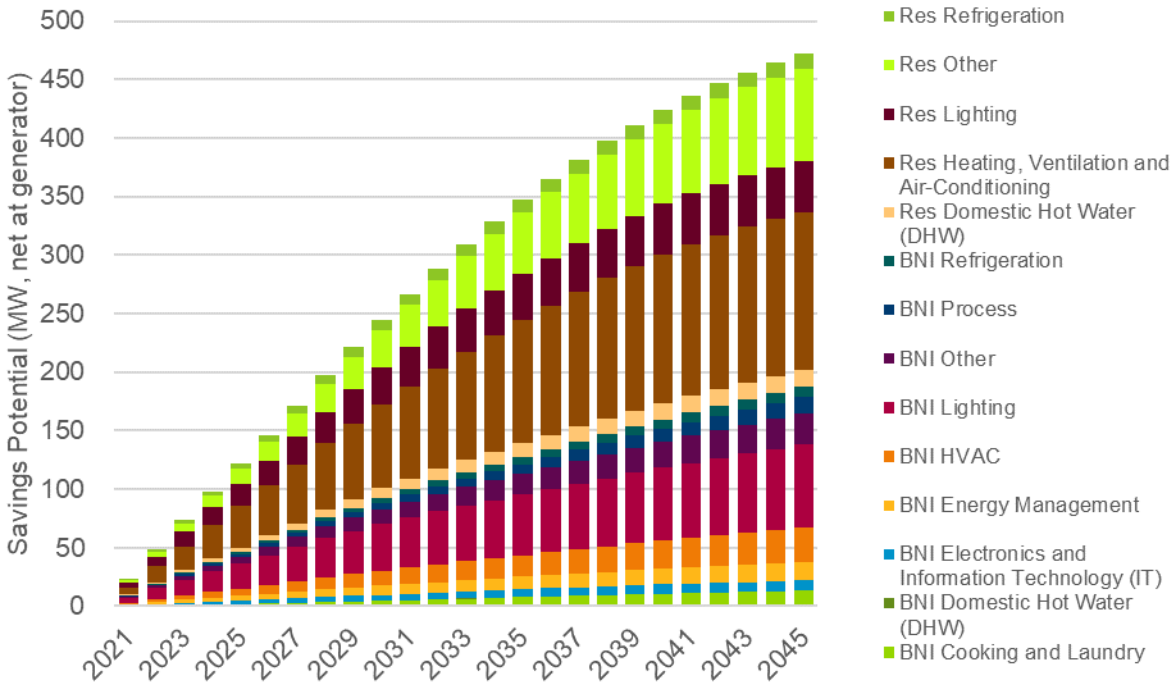


Source: Navigant analysis

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Figure 8-12 shows the winter peak demand market savings potential, net at generator, across end uses. The dominant end uses are BNI lighting and Res HVAC. A wide variety of technologies add to the BNI lighting savings led by LED troffers and linear replacement lamps. Res HVAC is led by whole home retrofits.

Figure 8-12. EE Base Case Market Potential, Cumulative Winter Peak Demand Savings by End Use (MW, net at generator)



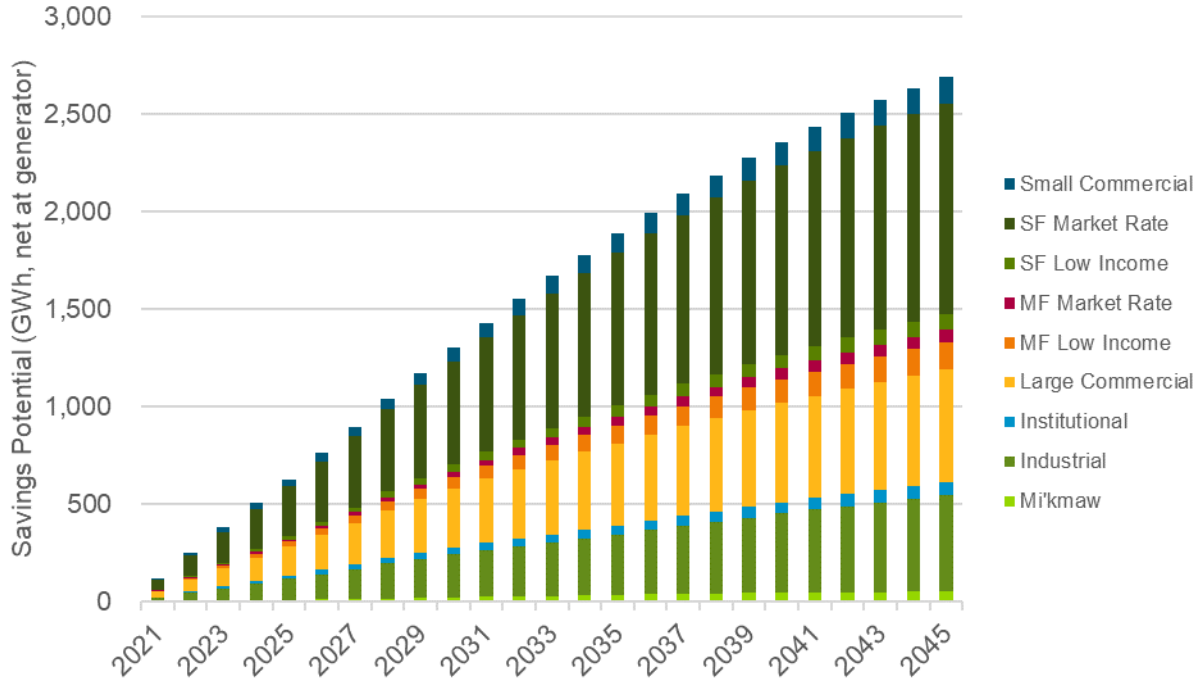
Source: Navigant analysis

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8.4 Energy Efficiency Potential Results by Customer Segment

Figure 8-13 shows the electricity market savings potential, net at generator, across customer segments. The dominant segment is residential single-family market rate, followed by industrial and large commercial. Other segments show less savings due to relatively small stocks. The segment cumulation increases proportionally through the study period, with no significant changes in which segment is dominant through time. Additional details and tabular data for customer segment level results are provided in Appendix F.

Figure 8-13. EE Base Case Market Potential, Cumulative Electricity Savings by Customer Segment (GWh, net at generator)

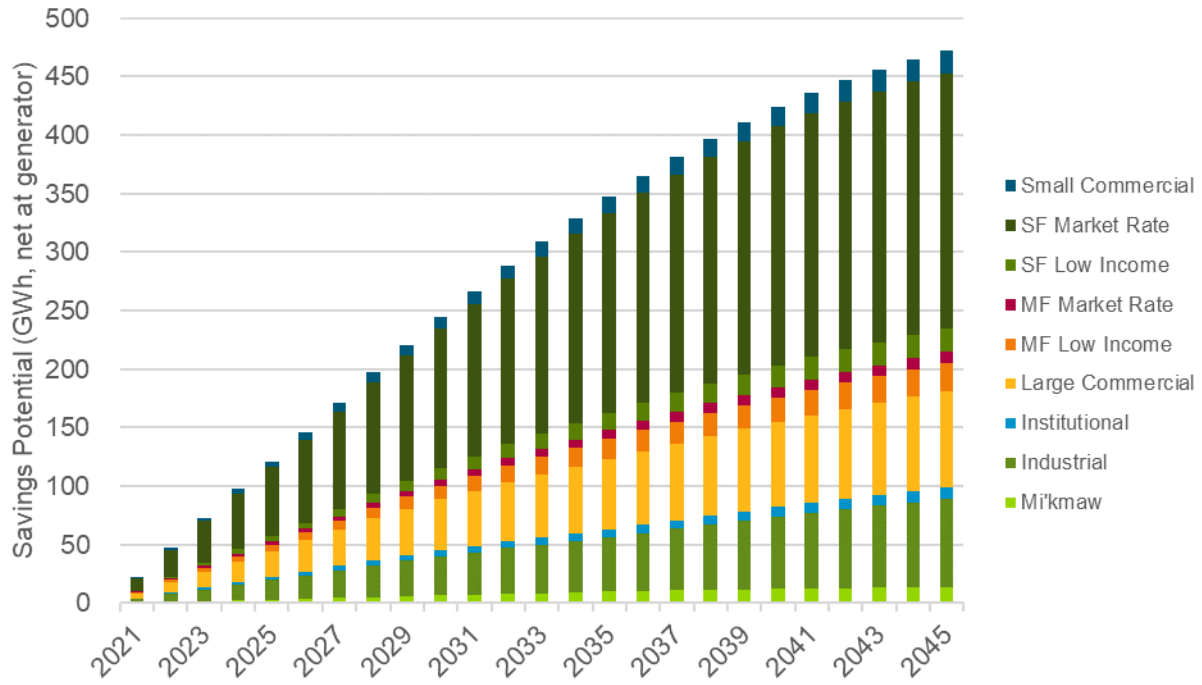


Source: Navigant analysis

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Figure 8-14 shows the winter peak demand market savings potential, net at generator, across customer segments. Similar to electricity, the dominant segments are residential single-family market rate, industrial, and large commercial. The segment cumulation increases proportionally through the study period, with no significant changes in which segment is dominant through time. Additional details and tabular data for customer segment level results are provided in Appendix F.

Figure 8-14. EE Base Case Market Potential, Cumulative Winter Peak Demand Savings by Customer Segment (MW, net at generator)



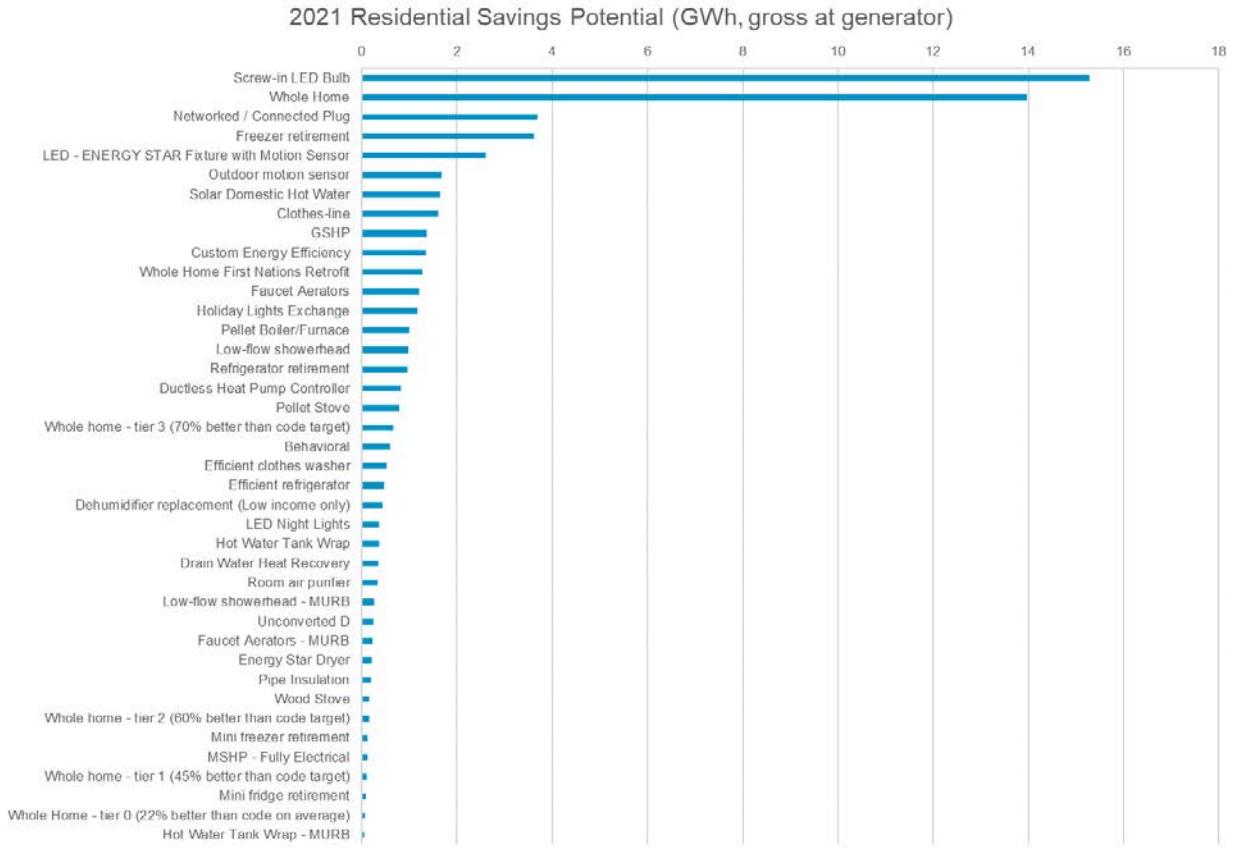
Source: Navigant analysis

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8.5 Energy Efficiency Potential Results by Measure

Figure 8-15 and Figure 8-16 show that many of the top ten electricity saving measures, net at generator, in 2021 come from the Res HVAC, Res Lighting, and BNI Lighting end uses. Residential screw-in LED Bulb ranks as the highest electricity-saving market potential measure for the residential sector while custom energy efficiency leads BNI. Savings drops sharply as the top 10 measures provide more than 50% of top 40 measure achievable savings in the residential sector. The BNI sector shows a more gradual decline in savings potential by measure, however, the top 20 measures still dominate total savings.

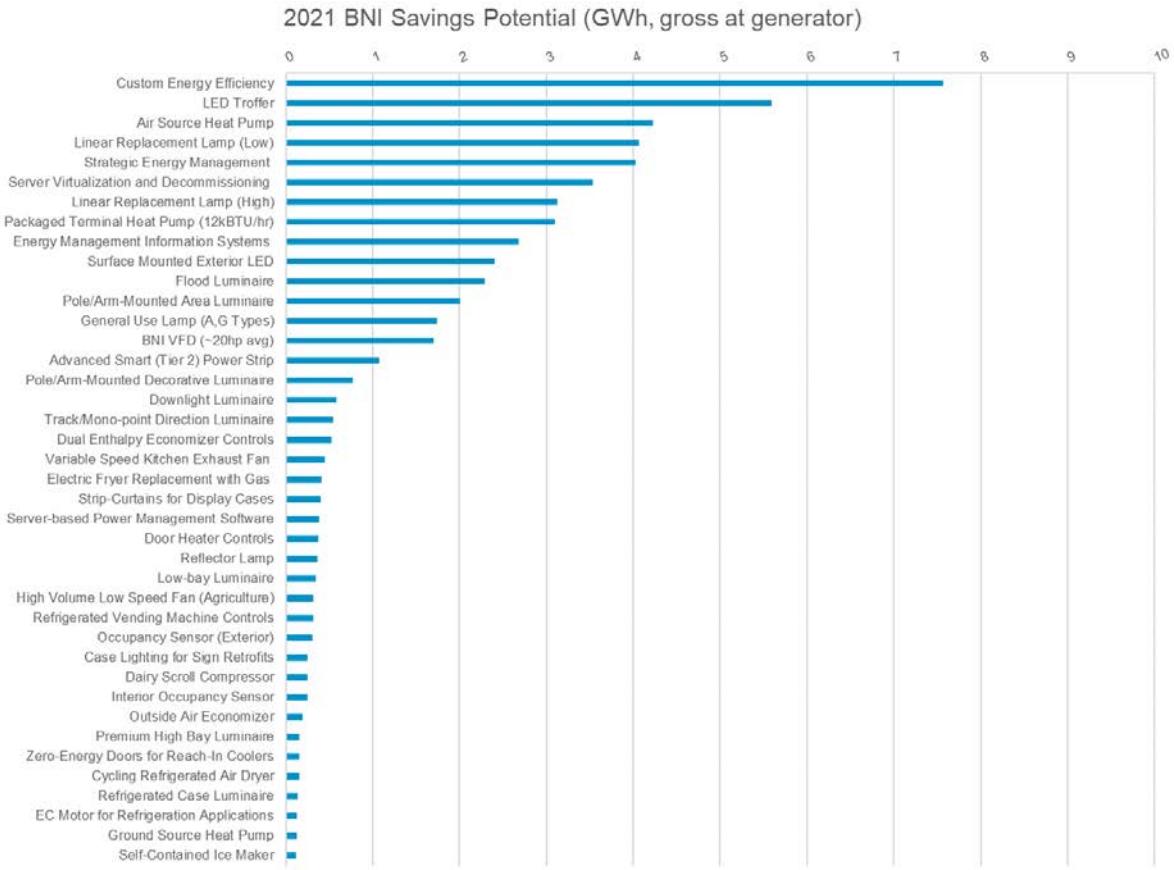
Figure 8-15. EE Base Case Market Potential, 2021 Top 40 Residential Measures for Electricity Savings (GWh, net at generator)



Source: Navigant analysis

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Figure 8-16. EE Market Potential, 2021 Top 40 BNI Measures for Electricity Savings (GWh, net at generator)

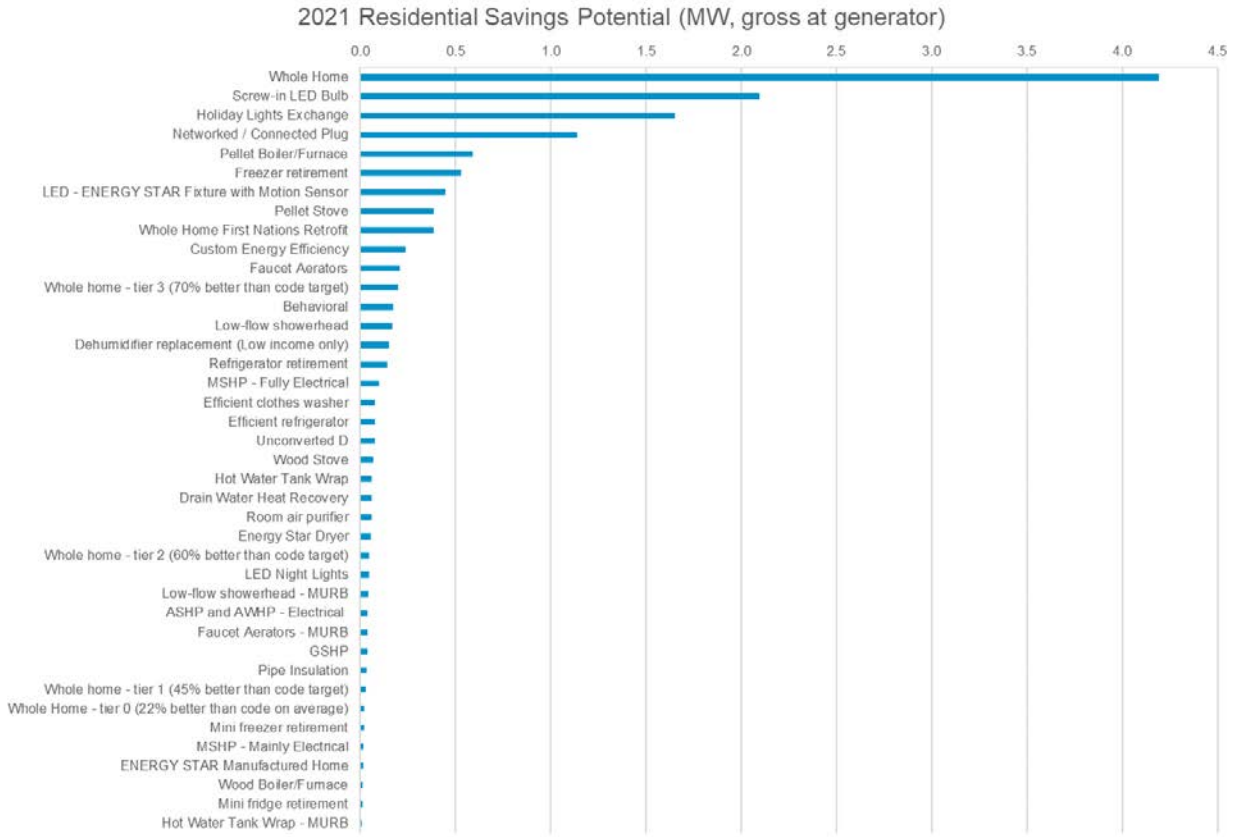


Source: Navigant analysis

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Figure 8-17 and Figure 8-18 show that many of the top ten winter peak demand saving measures, net at generator, in 2021 come from the Res HVAC, Res Lighting, and BNI Lighting end uses. Residential whole home ranks as the highest demand-saving market potential measure for the residential sector, far exceeding any other measure. In the residential sector, savings drops sharply as the top 10 measures provide more than 75% of top 40 measure achievable savings. Custom energy efficiency leads the BNI sector, however, the distribution of potential savings by measure is much more evenly distributed than residential.

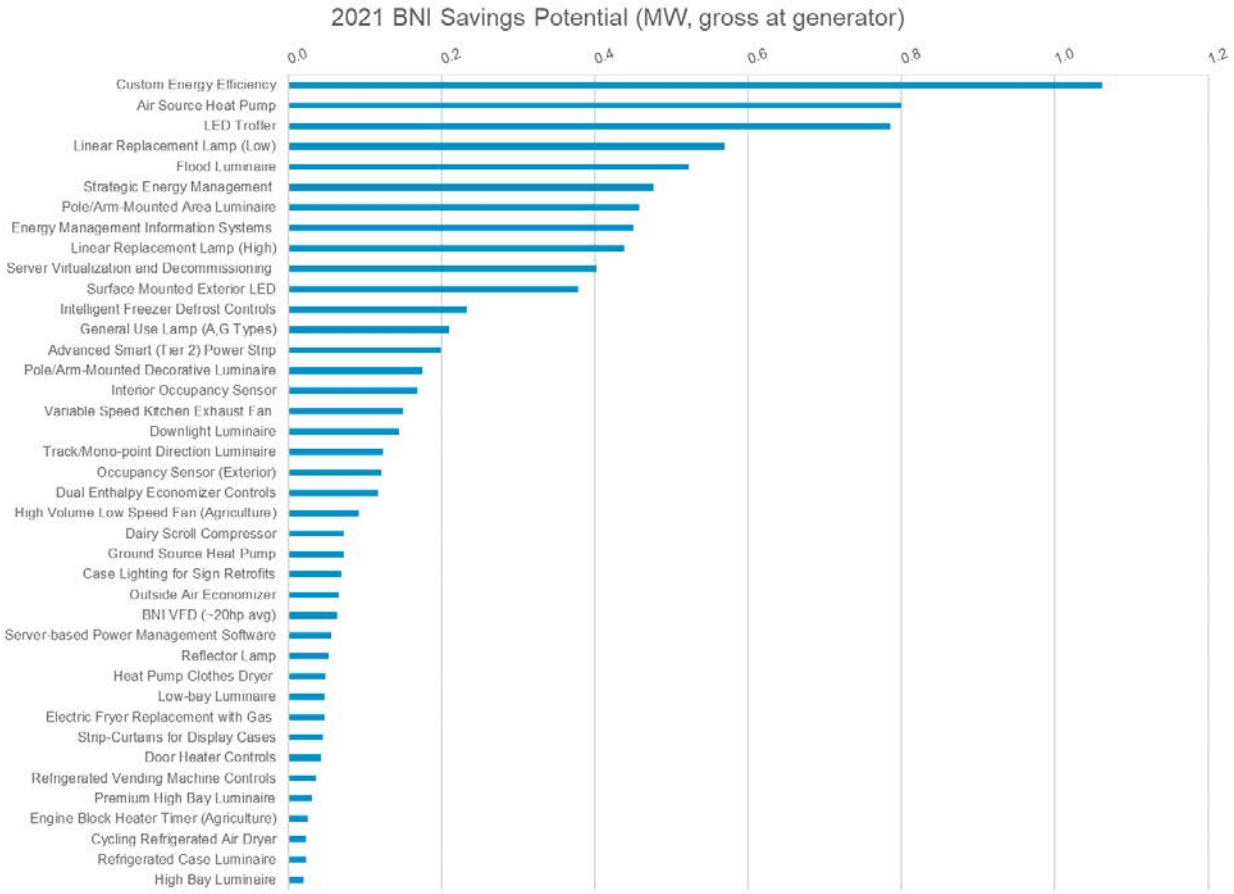
Figure 8-17. EE Base Case Market Potential, 2021 Top 40 Residential Measures for Winter Peak Demand Savings (MW, net at generator)



Source: Navigant analysis

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Figure 8-18. EE Base Case Market Potential, 2021 Top 40 BNI Measures for Winter Peak Demand Savings (MW, net at generator)



Source: Navigant analysis

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8.6 Cost Effectiveness Tests and Investment

The cost effectiveness approach is consistent with the methodology Navigant used for the economic potential presented in Section 4. Figure 8-19 shows the benefit-cost test ratios for the achievable base case, by sector and for the portfolio for each benefit-cost test. The benefit-cost test ratios are significantly greater than 1.0 for all benefit-cost test types at the sector and portfolio level across all analysis years, with the exception of the Rate Impact Measure (RIM) test, which has benefit-cost tests less than 1.0 for certain years and sectors.

Figure 8-19. EE Base Case Market Potential, Benefit-Cost Test Ratios for the Portfolio and by Sector

Sector	Year	Total Resource Cost Test	Program Administrator Cost Test	Participant Cost Test	Rate Impact Measure Test
BNI	2021	3.67	3.95	3.37	1.11
	2025	4.11	4.62	3.68	1.15
	2030	4.61	5.47	3.97	1.20
	2035	4.82	5.87	4.05	1.22
	2040	4.59	5.63	4.01	1.17
	2045	4.56	5.72	4.13	1.13
Residential	2021	3.87	5.43	4.50	0.85
	2025	3.78	5.31	4.50	0.84
	2030	3.73	5.46	4.51	0.84
	2035	3.59	6.53	4.33	0.84
	2040	3.35	5.83	4.30	0.78
	2045	3.18	5.12	4.33	0.72
Portfolio	2021	3.38	4.09	4.07	0.92
	2025	3.48	4.35	4.25	0.91
	2030	3.57	4.67	4.37	0.92
	2035	3.51	5.23	4.27	0.93
	2040	3.37	4.82	4.22	0.89
	2045	3.03	4.25	4.27	0.76

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Figure 8-20 presents the net benefits for the achievable base case, by sector and for the portfolio under each benefit-cost test. Coinciding with the benefit-cost test ratios, net benefits are positive in all cases, with the exception of the RIM test.

Figure 8-20. EE Base Case Market Potential, Cost Test Net Benefits for the Portfolio and by Sector (million $)

Sector	Year	Total Resource Cost Test	Program Administrator Cost Test	Participant Cost Test	Rate Impact Measure Test
BNI	2021	$56.82	$58.73	$58.57	$7.80
	2025	$69.61	$72.49	$69.67	$12.14
	2030	$81.19	$86.57	$77.75	$17.79
	2035	$77.42	$83.43	$72.43	$18.45
	2040	$83.84	$90.27	$82.83	$16.34
	2045	$79.29	$85.83	$82.81	$12.04
Residential	2021	$81.87	$90.09	$137.62	-$18.77
	2025	$110.82	$122.30	$204.16	-$28.37
	2030	$131.20	$146.37	$262.53	-$35.16
	2035	$123.45	$144.97	$264.42	-$31.76
	2040	$96.17	$113.55	$246.42	-$37.96
	2045	$72.14	$84.69	$226.34	-$40.71
Portfolio	2021	$132.70	$142.83	$196.20	-$16.96
	2025	$172.93	$187.28	$273.84	-$23.73
	2030	$203.55	$224.11	$340.28	-$26.21
	2035	$192.27	$219.79	$336.85	-$21.92
	2040	$171.85	$195.66	$329.25	-$29.78
	2045	$144.20	$163.29	$309.15	-$35.90

Source: Navigant analysis

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Figure 8-21 presents the modelled investment for the achievable base case, by sector and investment type. All investment values are presented here as nominal dollars. For the base case, total investment levels range between $40 million and $65 million annually throughout the 25-year study period, with a peak of $64 million in 2028.

To estimate portfolio fixed administrative costs through time, Navigant used approximately 50% of total administrative spending in the base case. The values for this investment type change year-over-year due to the changes in measure mix delivery and market conditions as modeled in this study. This investment type is fixed and not associated with a specific measure or program, therefore, it does not affect the measure level cost-effectiveness screening. Additionally, because this investment is an estimate of the minimum required fixed administrative to deliver programs, it is held constant between achievable scenarios. Investment details for each scenario are provided in Appendix F.

Figure 8-21. EE Base Case Investment, by Investment Type for the Portfolio (nominal million $)

Year	Incentives	Variable Program Administrative Costs	Fixed Program Administrative Costs	Portfolio Total
		nominal million dollars		
2021	$32.74	$5.84	$5.99	$44.57
2022	$36.30	$6.54	$6.73	$49.57
2023	$36.93	$6.73	$6.91	$50.57
2024	$39.08	$7.17	$7.36	$53.61
2025	$39.49	$7.44	$7.50	$54.44
2026	$43.44	$8.06	$8.20	$59.70
2027	$42.97	$8.27	$8.48	$59.73
2028	$46.24	$8.76	$8.98	$63.98
2029	$42.48	$8.51	$8.71	$59.70
2030	$43.99	$8.64	$8.84	$61.46
2031	$37.13	$8.68	$8.76	$54.58
2032	$37.23	$8.70	$8.88	$54.81
2033	$36.04	$8.58	$8.77	$53.39
2034	$37.21	$8.61	$8.74	$54.57
2035	$37.03	$8.51	$8.61	$54.15
2036	$37.85	$8.49	$8.59	$54.93
2037	$38.36	$8.42	$8.60	$55.38
2038	$37.92	$8.26	$8.47	$54.65
2039	$37.79	$8.12	$8.33	$54.24
2040	$37.69	$7.95	$8.16	$53.80
2041	$36.10	$7.67	$7.87	$51.64
2042	$35.76	$7.51	$7.71	$50.98
2043	$35.28	$7.34	$7.54	$50.16
2044	$34.84	$7.18	$7.38	$49.39
2045	$34.41	$7.03	$7.23	$48.68
Total	$954.30	$197.02	$201.33	$1,352.65

Source: Navigant analysis

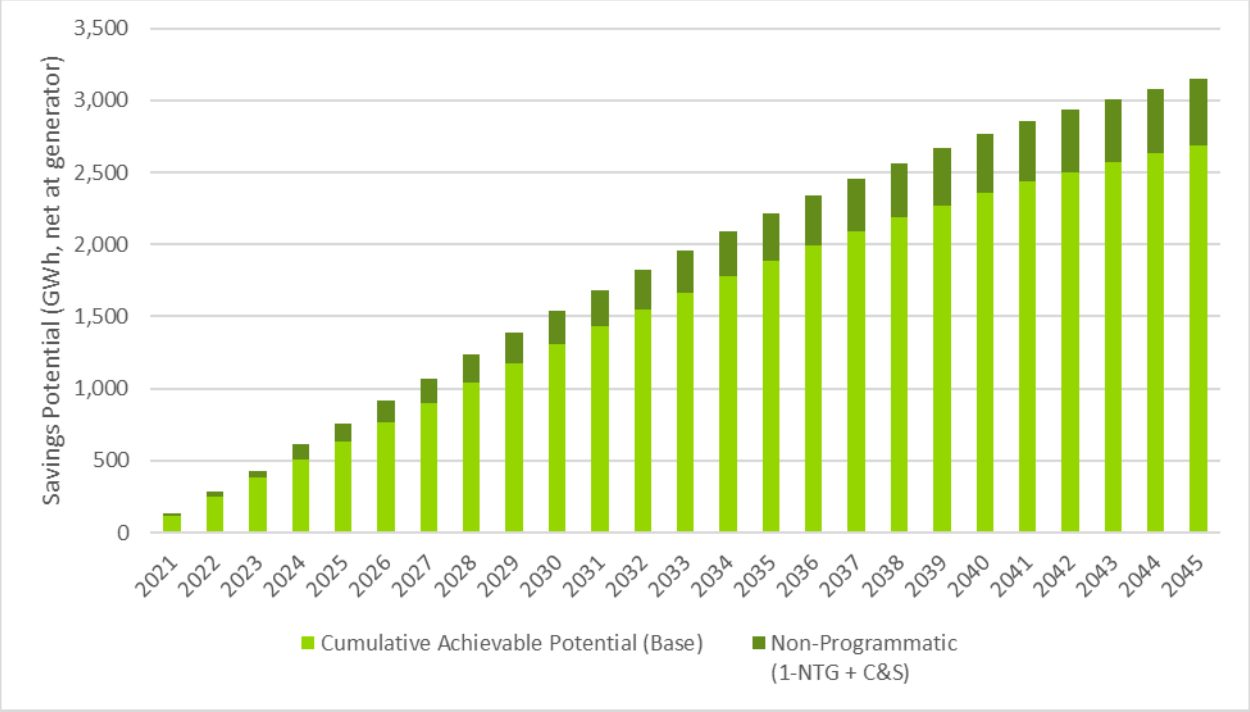
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8.7 Non-Programmatic Savings

For this study, Navigant defines non-programmatic savings as reductions in savings potential due to codes and standards, and freeridership. It is important to note that savings potential for codes and standards do not represent total impacts due to C&S outside of DSM programs, just effects on program savings potential.

The technical and economic savings shown throughout this report are net of codes and standards savings, while the achievable potential scenarios are net of both codes and standards, and freeridership. Figure 8-22 shows the cumulative base case achievable potential stacked with cumulative non-programmatic savings. Therefore, the cumulative potential values shown below will be higher than those shown in Section 6. Non-programmatic savings yields 11% of total savings in 2021, and peaks at 17% in 2025. This increase is seen in 2024 and is caused by the inclusion of screw-in lighting standards changes. This corresponds to the decrease in residential achievable potential seen in 2024 in Section 6.

Figure 8-22. Cumulative Achievable Potential (Base Case) and Non-Programmatic Electricity Savings (GWh, net at generator)



Source: Navigant analysis

8.8 Hourly Loadshape Disaggregation

At the request of the DSMAG stakeholder group, Navigant developed 8760 profiles for base case achievable potential savings to align with NS Power's IRP end-use inputs. The results of this analysis are provided in Appendix G. This data has been summarized in the appendix at the sector level due to the volume of data.

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9. ENERGY EFFICIENCY MARKET POTENTIAL SENSITIVITY ANALYSIS RESULTS

In order to demonstrate the response of the base achievable forecast to incremental changes in inputs, Navigant conducted a parametric sensitivity analysis on the cumulative achievable energy savings potential at the end of the forecast horizon (2045) in the Base scenario. To determine the sensitivity of the results to seven input variables, Navigant varied each parameter by +/-25%, except for the price of CO_2 and the achievable potential B/C screening thresholds, both of which were only varied unidirectionally. CO_2 prices were varied from $0 to $100/metric tonne, and the achievable screening threshold was varied by -25%. It is worth noting that because the model has multiple non-linear components, the effects of varying a parameter is often asymmetrical. For each sensitivity, all other variables were held constant, allowing individual effects to be observed.

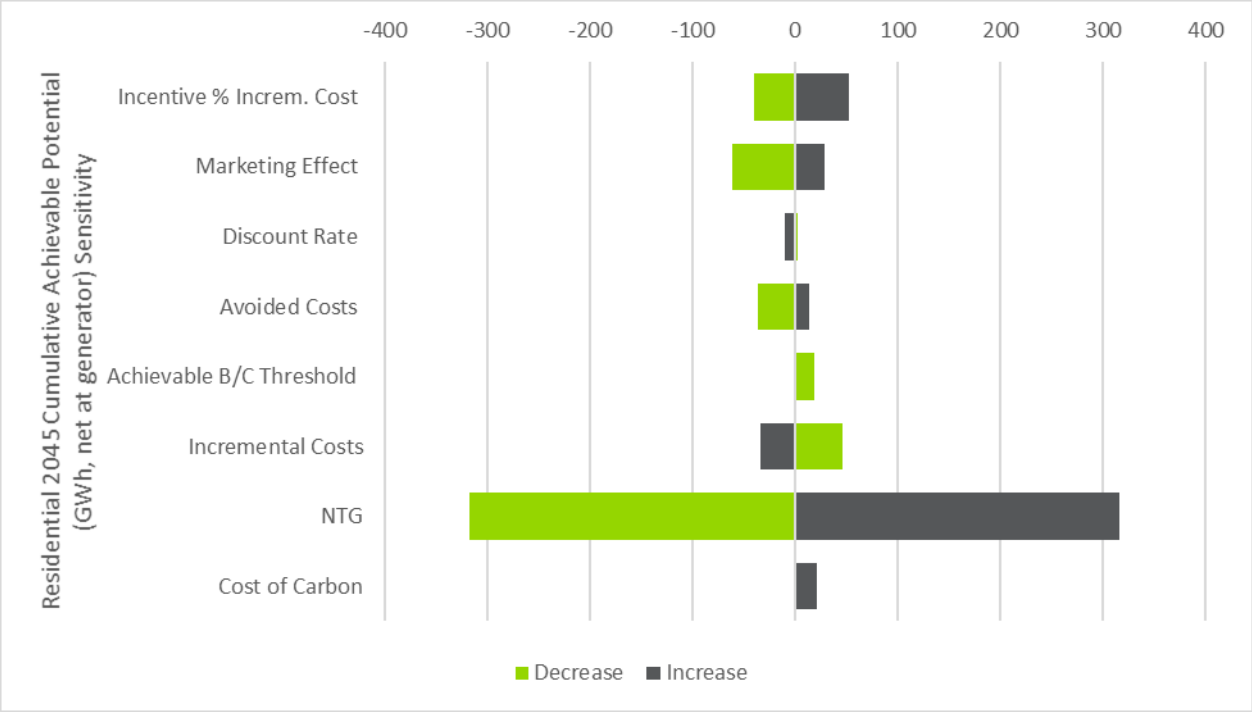
Residential achievable potential sensitivity is shown in Figure 9-1. Of the seven parameters tested, the residential cumulative potential by 2045 is the most sensitive to net-to-gross ratio, marketing effects, and incentive changes. Marketing effects influence the growth of customer awareness, and along with incentives are a primary pathway that program administrators use to influence the adoption of efficient measures. The stronger down-side response is suggestive of a more mature residential market – skewed by several large measures like screw-in LEDs. On the other hand, the response to varying incentive levels has the opposite effect because of the ability for incentives to push more nascent technologies like network connected plugs into a steeper part of the payback curve. This effect demonstrates the non-linearity of customer price response. The net-to-gross ratio influences measure TRC ratio, and therefore whether a measure is included in the achievable potential (passes the 0.7 TRC screening threshold). Additionally, net-to-gross ratio directly impacts the unit energy savings. This direct impact on savings values manifests in greater sensitivity than other model inputs, however, any reductions in net-to-gross ratio (as a result of an increase in freeridership) would be captured in the non-programmatic savings.

By contrast, the avoided costs and discount rates have comparably small impacts on the achievable potential with the same percentage-wise variation because these only influence the screening of the measure by acting indirectly through the TRC. Thus, it requires a change in the avoided costs of more than 25% to change the TRC benefit-cost ratio by 25% because of the diluting influence of incremental costs, net to gross ratios, and administrative costs – all of which effect the benefit/cost ratio as well. As can been seen by the larger sensitivity to carbon price than avoided costs, the $100/metric tonne of carbon adder equated to more than a 25% increase in the avoided costs as they impact analysis in the same way.

Incremental costs have a relatively large effect on potential because of their role in determining the market shares between measures in a competition group as well as the TRC screen. Relative to BNI, more measures switch between passing TRC screening or not when the incremental costs are changed (this is also true for avoided costs), generating a larger response.

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Figure 9-1. EE Residential 2045 Cumulative Achievable Potential Sensitivity (GWh, net at generator)



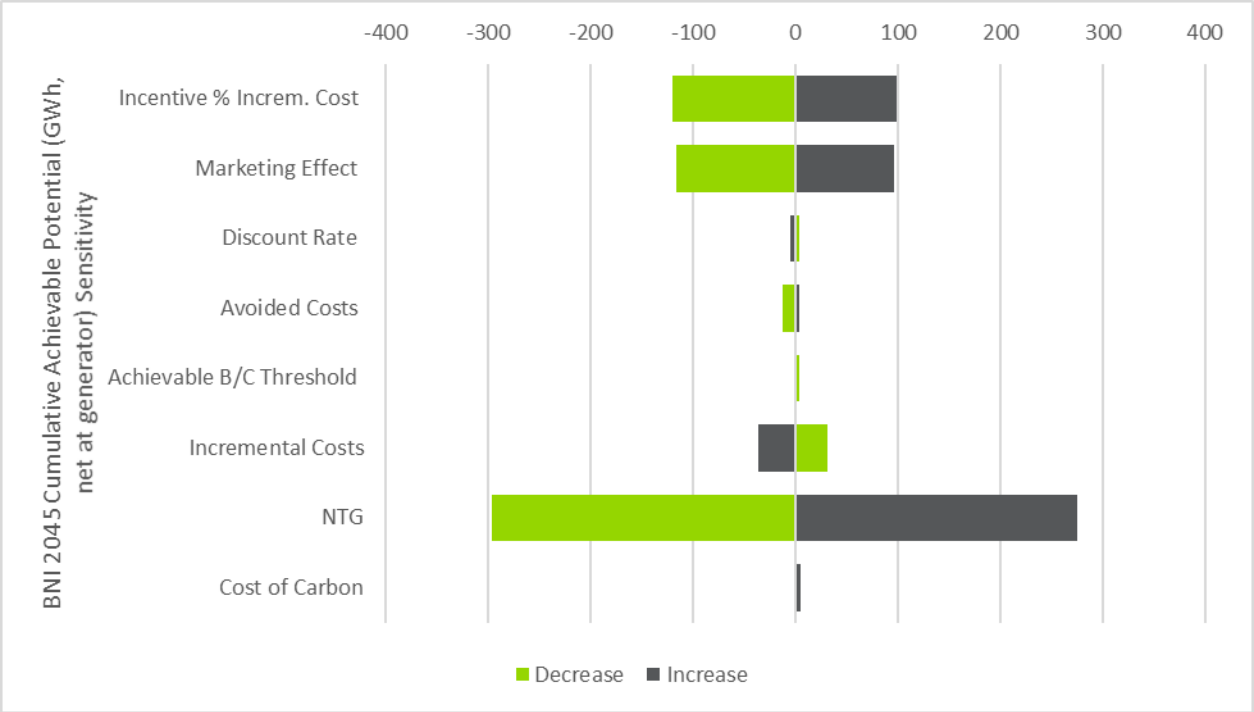
Source: Navigant analysis

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BNI sensitivities are shown in Figure 9-2. Overall the response of the cumulative BNI achievable potential to the chosen parameter variations is similar to residential, both in order of importance, and magnitude of the response. The most important difference is the larger sensitivity in BNI to both marketing and incentive changes. This is due more to the location of important BNI measures, such as LED troffers, and strategic energy management at steep-sloping areas in the payback curve where diminishing returns do not kick in, and the response can be symmetric.

Similarly, because awareness in BNI tends to be higher overall, but is not yet 100% for several key measures (particularly in lighting and HVAC), significant positive or negative feedback can be triggered through marketing, yielding a sharper response. The same effect observed in residential around avoided costs and discount rates is true for BNI – because these inputs work through the TRC and are influenced by other factors, they tend to be second-order effects when there are not large measures that are near a tipping point.

Figure 9-2. EE BNI 2045 Cumulative Achievable Potential Sensitivity (GWh, net at generator)



Source: Navigant analysis

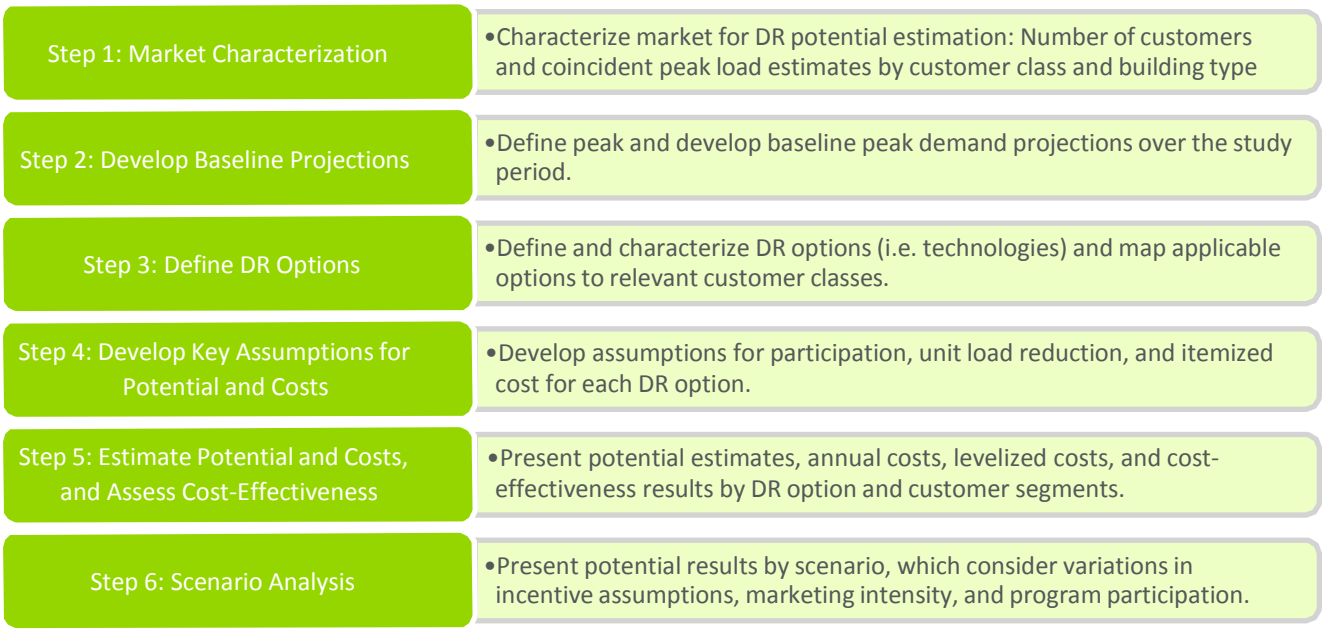
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10. DEMAND RESPONSE METHODOLOGY

Navigant developed demand response potential and cost estimates using a bottom-up analysis. The analysis utilizes primary data from Nova Scotia Power and relevant secondary sources of information, as documented in the appendices and the input workbook that accompanies this report (see Appendix C). Navigant customized its DRSim™ model, which uses this data as inputs, for this study. The following subsections detail Navigant's DR potential and cost estimation methodology, as summarized in Figure 10-1. The methodology is as follows:

1. Characterize market for DR potential by quantifying the number of eligible customers
2. Estimate coincident winter peak load by customer class and building type over the study period (2021 – 2045)
3. Define and characterize DR options, and map applicable options to relevant customer classes and/or building types
4. Develop participation levels, unit load reductions, and cost assumptions for each DR option, by customer class and building type combination
5. Present potential estimates, annual costs, levelized costs and cost-effectiveness results by DR option, customer class and building type
6. Conduct scenario analysis and present DR potentials, annual costs and cost-effectiveness results by scenario

Figure 10-1. DR Potential Assessment Steps



Source: Navigant

10.1 Demand Response Market Characterization

Market characterization is the first step in the DR potential assessment process. The market characterization process for the DR assessment aimed to segment the market appropriately for the analysis. Specifically, Navigant aggregated data on key pieces of information, such as customer

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count and peak load, by customer segment and end-use to use as inputs into the model. Navigant based the segmentation on the examination of NS Power's rate schedules and the customer segments established in the energy efficiency potential study.

Figure 10-2 presents the different levels of market segmentation for DR potential assessment. The segmentation by customer size, according to demand values, is based on NS Power rate classes. Navigant also used Dun & Bradstreet (DnB) customer data that indicated the breakdown of BNI customers and sales by business type to disaggregate customer count and peak demand estimates.

Figure 10-2. Market Segmentation for DR Potential Assessment

Level	Description
Level 1: By Sector	• Residential • Commercial and Industrial (BNI) • Electric Vehicles (EV)
Level 2: By Customer Class [13]	• Residential • BNI » Small Commercial » Large Commercial » Small Industrial » Large Industrial » Interruptible Rider [14] • Electric Vehicles
Level 3: By Building Type [15]	• Residential » Residential LI » Residential • BNI » Manufacturing » Miscellaneous » Offices » Retail Trade » Services » Market Rate • Electric Vehicles

Source: Navigant

Level 1: Sector

Navigant segmented customers into residential and BNI sectors. Additionally, Electric vehicles (EVs) are considered in aggregate across all customer classes since the EV forecast did not specify the distribution of EVs across the various customer segments.

Level 2: Customer Class

Navigant further segmented the BNI customer class into five categories based on the demand values following NSP's rate schedules. These size categories are also referred to as the BNI customer class. The segmentation by size was necessary as the type of DR program offer varies by customer size.

[13] Mapping between customer classes and NS Power rate classes is provided in Figure 13-3.

[14] Customers on Interruptible Riders were called out separately to identify the potential associated with these customers.

[15] Mapping between building types and Dunn & Bradstreet (DnB) business types is provided in Figure 13-3.

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Navigant did not segment residential customers by demand since the variation of demand values across residential customers is low. Electric vehicle owners also were not segmented further. Mapping between NS Power rate classes to those used in the DR study are provided in Figure 10-3.

Figure 10-3. Mapping Between Nova Scotia Power Rate Class and DR Study Customer Class

Mapped Customer Class in DR Potential Study	Nova Scotia Power Rate Class
Residential	Residential
Small Commercial	Small General
	General
Large Commercial	Large General
Small Industrial	Small Industrial
Large Industrial	Medium Industrial
	Large Industrial
Interruptible	Interruptible Rider

Source: Navigant

Level 3: Customer Segment

Navigant further segmented BNI customers into segments or building types by mapping the DnB business types to the building types considered in the analysis. Mapping between NS Power building and business types is provided in Figure 10-4.

Figure 10-4. Mapping Between Nova Scotia Power Building Type and Business Type

Building Type (Used in analysis)	Business Type[16]
Offices	Finance, Insurance, And Real Estate
	Public Administration
Retail Trade	Retail Trade
Services	Services
Manufacturing	Manufacturing
	Agriculture, Forestry, And Fishing
	Construction
	Other Service Industries
	Transportation, Communications, Electric, Gas, And Sanitary Services
	Wholesale Trade
	Charitable Premises

Source: Navigant

10.2 Demand Response Baseline Projections

The next step after market segmentation was to develop baseline projections for the number of accounts and associated winter peak demand by customer class and segment over the potential analysis period. The baseline projections aimed to define and forecast customer data for the study period, similar to the market

[16] These business types were sourced from the DnB dataset provided by EfficiencyOne.

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characterization in the EE assessment. Navigant selected 2018 as the base year for the study, since it is the latest year for which full market data is available at the time of the analysis. The baseline projections for the number of accounts and peak demand were developed at the following levels:

- Number of accounts
  - By customer class and building type
- Winter peak demand projections
  - By customer class, building type and end use

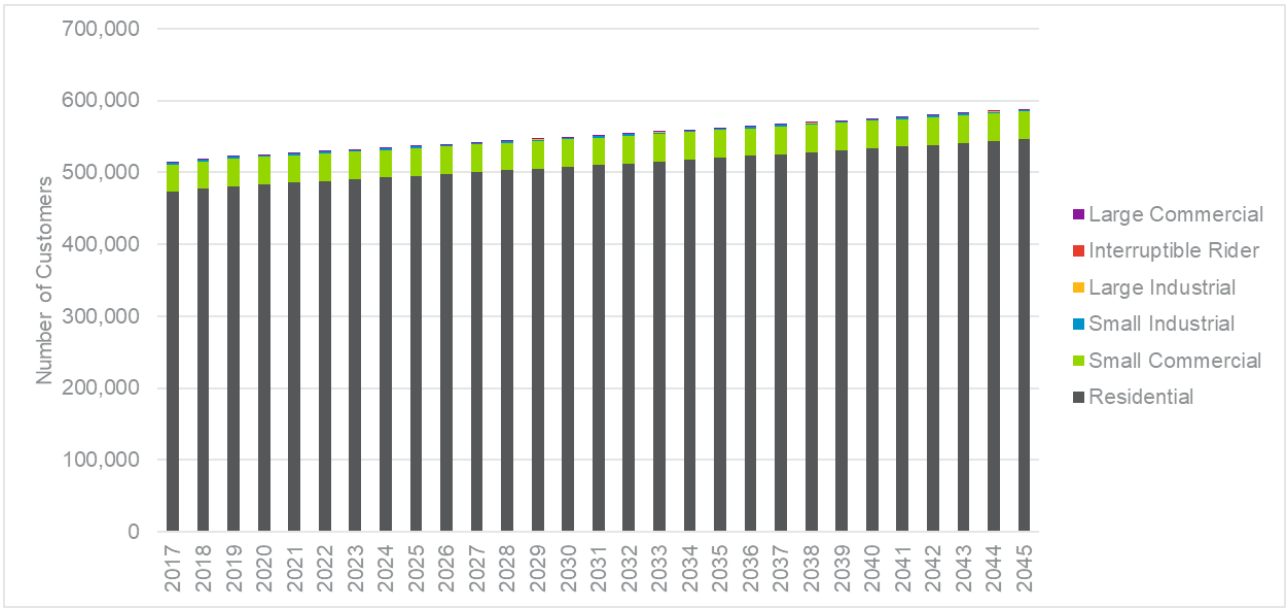
10.2.1 Customer Count Projections

The steps to generate customer count projections include:

- Separate out Interruptible Rider customers using BNI account counts by rate class
- Exclude Outdoor Recreational Lighting, Unmetered, GRLF, RTP, Shore Power
- Disaggregate customer counts 2020-2022 Plan Rate and Bill Impact Analysis customer counts using NS Power data on BNI account counts by business types
- Blend Municipal customers, assuming the same distribution as NS Power customers
- Disaggregate Residential accounts into Market Rate, Low Income, and Charitable Premises using NS Power data on Charitable Premises and Low-Income rates
- Blend Municipal customers, assuming the same distribution as NSP customers
- Disaggregate Residential accounts into Market Rate, Low Income, and Charitable Premises using NSP data on Charitable Premises and Low-Income rates

Figure 10-5 and Figure 10-6 summarize the account count projections by customer class.

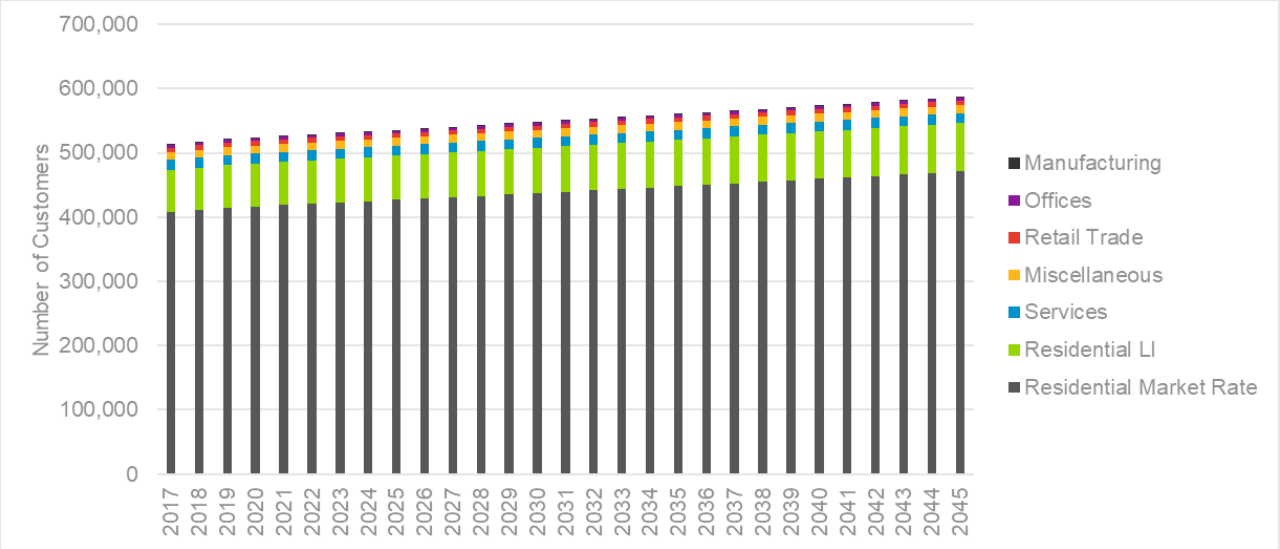
Figure 10-5. Customer Count Forecast by Customer Class



Source: Navigant

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Figure 10-6. Customer Count Forecast by Building Type



Source: Navigant

10.2.2 Peak Period Definition and Peak Demand Projections

A key element of market characterization for the DR potential study is to develop disaggregated bottom-up peak demand projections by customer class, segment and end use, which serves as the foundation for the DR potential estimates. Figure 10-7 shows the stepwise approach used to develop baseline peak demand projections.

Figure 10-7. Baseline Peak Projection Steps

Define Peak Period	•Based on historical hourly system load data, the peak period was defined as 5-8pm for the months of December, January, and February
Calculate Coincident Peak Demand Factors	•Use the peak period and normalized 8760 loadshapes from a prior EfficiencyOne study conducted
Obtain End Use Shares	•Use NS Power End Use Model results to obtain end use shares for each building
Determine Energy Sales after DSM	•Subtract Navigant's EE potential study results from NS Power sales forecast before
Calculate Bottom-Up Peak Demand Projection	•Apply coincident peak demand factors and end use shares to forecasted retail energy sales to obtain demand projections for the peak period
Calibration	•Calibrate results to align with 3CP demand distribution.
Develop Separate Peak Demand Projections for EVs	•Use EV adoption forecast and estimated peak demand from charging to develop peak demand projections

Source: Navigant

The first step in this approach was to define the peak period. Based on analysis of hourly system load data, Navigant determined that 5-8 pm for the months of December, January, and February constitute the peak period. Navigant used this definition to develop coincident peak demand estimate by customer class, building

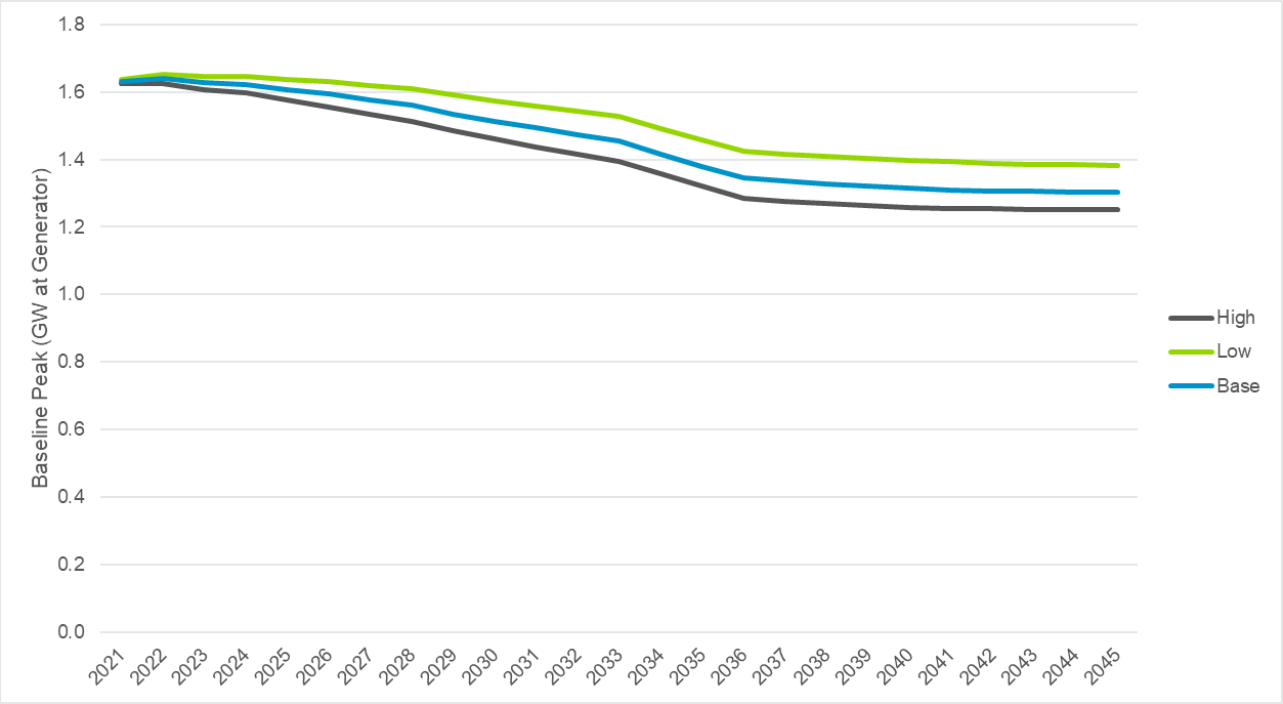
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type and end use. The primary data sources for developing these estimates were 8760 system data, forecasted retail sales data, end use model results from NSP, energy efficiency potential results. Navigant used the data from these sources to develop coincident peak demand estimates by customer class and building type for the base year, and then Navigant projected these estimates for future years by scaling these values with the retail sales forecast. For coincident winter peak demand estimates for EVs, Navigant used per vehicle impacts from NSP's load forecast and vehicle adoption forecasts from the Navigant-developed Vehicle Adoption Simulation Tool (VAST).

Three different scenarios from the Energy Efficiency Potential Study were considered in the baseline winter peak projections: (1) low, (2) base, and (3) mid. These correspond to the scenarios low, base, and high, respectively, in the DR study.

Figure 10-8 shows the baseline peak projections across the various scenarios. Note that the scenario names refer to the level of energy efficiency savings assumed to occur, so the baseline peak demand for the high scenario (with highest energy savings among these three scenarios) is lower than that of the low and base scenarios. As energy efficiency savings increase in the future, peak demand is projected to decrease. It is important to note that the peak period is defined differently than in the EE study.[17]

Figure 10-8. Winter Baseline Peak Forecast by DR Scenario (GW at generator)



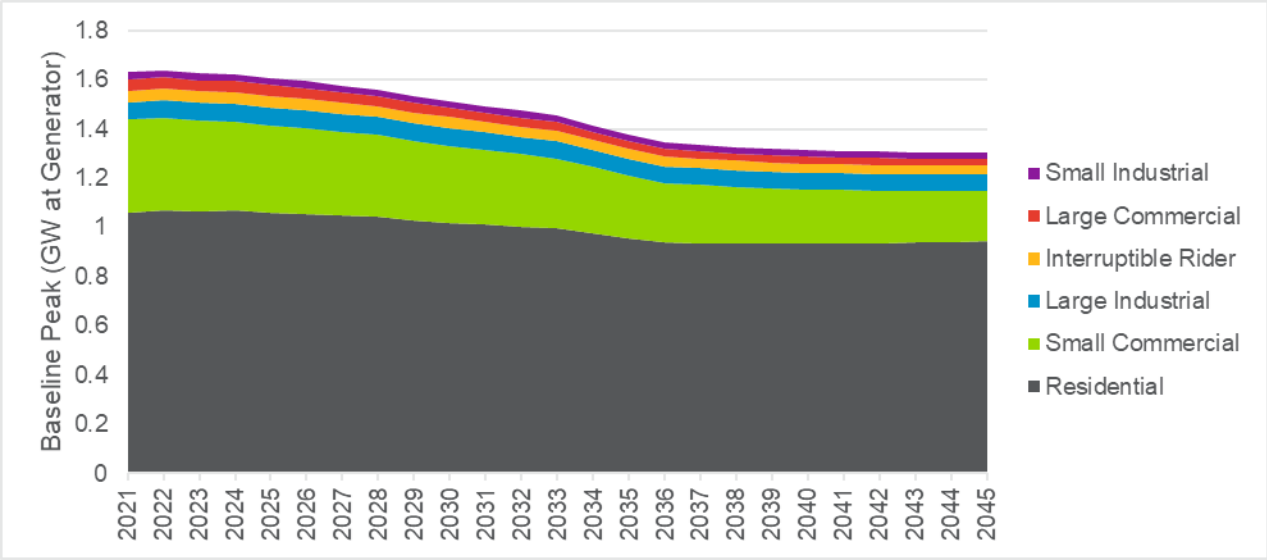
Source: Navigant analysis

[17] The baseline peak forecast represented here is different from the peak forecast by NS Power. The peak demand shown in the figure is the average peak demand over the 3-hr. peak period (5 p.m. to 8 p.m.) from December to February. This serves as the baseline peak demand for estimating load reduction impacts from DR programs. NS Power's peak forecast represents the single hour system peak demand. Therefore, the peak definition is different in the two cases. Moreover, the peak demand forecast shown in the graph represents the peak demand net of energy efficiency potential estimates from Navigant's analysis presented in this report, which is not incorporated in NS Power's peak demand forecast. The DR forecast also excludes Outdoor Recreational Lighting, Unmetered, GRLF, RTP, Shore Power, and Mining customers since these segments tend to be ineligible for DR programs.

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The following baseline peak figures are for the base scenario, but the same distribution can be assumed for the other two scenarios. Figure 10-9 shows the estimated peak demand over the forecast period, broken out by customer class. Residential makes up the largest segment, followed by small commercial. The remaining four customer classes – large commercial, small industrial, large industrial, and customers on Interruptible Rider - constitute around 10% to 15% of the total peak demand.

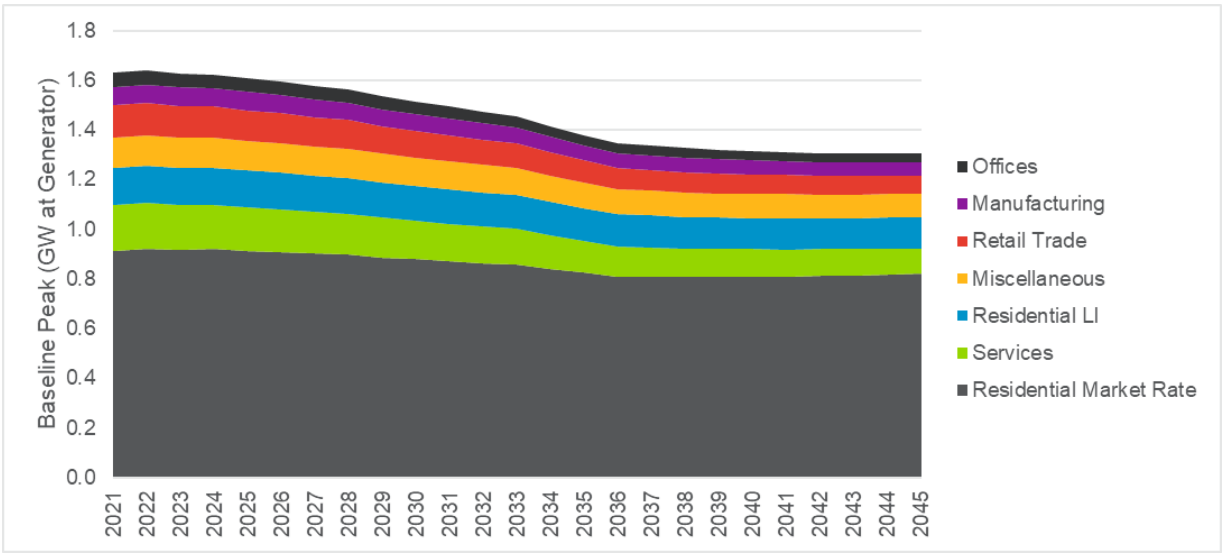
Figure 10-9. Winter Baseline Peak Forecast by Customer Class (GW at generator)



Source: Navigant analysis

Figure 10-10 shows the baseline peak forecast broken out by building type.

Figure 10-10. Winter Baseline Peak Forecast by Building Type (GW at generator)



Source: Navigant analysis

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10.2.3 Battery Adoption Projections

Due to a lack of information on battery adoption projections in Nova Scotia, Navigant developed high-level battery adoption forecasts using assumptions drawn from Navigant Research reports and industry expertise.[18]

In order to project battery adoption by customer class, Navigant first estimated the size of the battery to be 5 kW and 10% of the customer demand and the capacity to be two hours, since smaller capacities tend to be more economically feasible. Then, upfront costs and O&M costs based on Navigant Research data were used to calculate equipment costs borne by the customer. Capital costs are assumed to decline at 5% per year for the next 10 years. Annual customer bill savings were determined by obtaining demand and energy charges from NS Power tariffs and calculating the demand charge savings for BNI customers and energy arbitrage values for customers with a time-varying rate. This information was used to calculate the simple payback period for each customer class, which in conjunction with payback acceptance curve,[19] determines the long-run equilibrium level of customer adoption. A non-economic adoption adder of 2.5% was added to residential customers to capture other causes of natural adoption including resiliency. The adoption was then simulated to follow a Bass-diffusion curve with a 10-year ramp rate.

Figure 10-11 presents battery capacity forecasts for select years developed using the methodology outlined in this section. The accompanying input assumptions worksheet contains values for all years.

Figure 10-11. Battery Capacity Projections (MW at meter)

Customer Class	2021 MW at meter	2030 MW at meter	2040 MW at meter
Interruptible Rider	0.2	2.5	2.6
Large Commercial	0.2	2.3	2.4
Large Industrial	0.4	3.7	3.8
Residential	6.2	67.5	73.0
Small Commercial	0.9	9.0	9.2
Small Industrial	0.0	0.2	0.2
Grand Total	7.9	85.2	91.2

Source: Navigant analysis

10.2.4 Electric Vehicle Projections

The forecasts produced for this report are derived from Navigant's Vehicle Adoption Simulation Tool (VAST™). VAST™ integrates a provincial-level systems dynamics routine driven by technology attributes including the total cost of vehicle ownership, range, fueling characteristics, and customer behaviour, and a census-tract level socio-demographic component. The systems dynamics modeling yields the forecasts for the Plug-In Electric Vehicle (PEV)[20] population of a given geography, typically the size of a province or a country. Projections on new PEV sales are generated through an enhanced Bass Diffusion framework, combining a logit technology competition model that generates the long-run equilibrium market share for

[18] Battery projections are typically an input to the DR analysis but are not necessarily developed as part of the analysis. Due to a lack of information/data on battery projections in Nova Scotia, Navigant developed high-level battery projections using a relatively simple approach that estimates battery adoption based on simple payback analysis. Detailed modeling of battery projections was outside the scope of the DR study.

[19] Payback acceptance curves are based on Navigant studies on battery adoption for utilities in other jurisdictions.

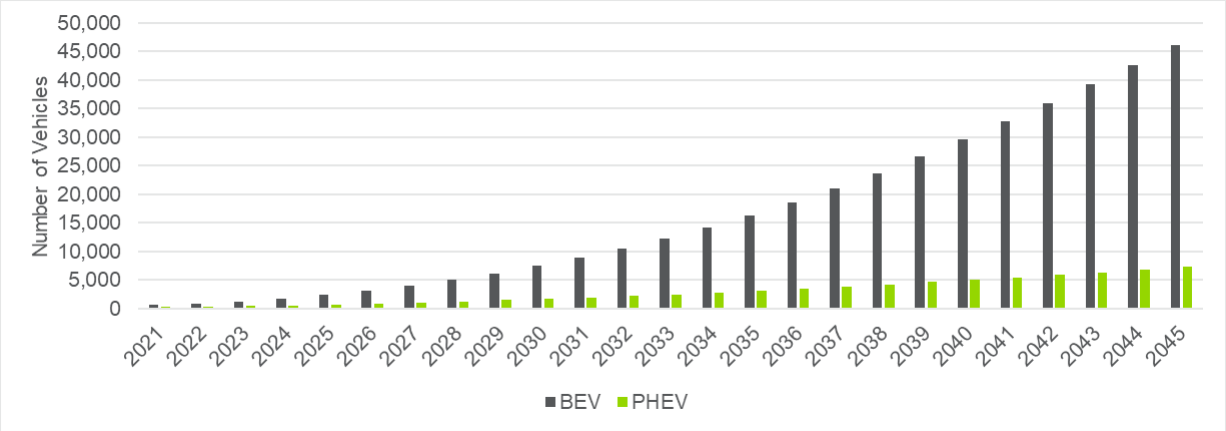
[20] PEVs include Battery Electric Vehicles (BEV) and Plug-In Hybrid Electric Vehicles (PHEV), but not Hybrid Electric Vehicles (HEV).

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each powertrain, vehicle class, and ownership combination, with a Bass Diffusion model simulating the growth in technology awareness over time.

Nova Scotia is low on the adoption curve with only 130 PEVs on the road as of late 2018. In 2030, approximately 1% of all vehicles on the road are predicted to be PEVs. By 2045, the forecast shows 1,300,000 total vehicles in Nova Scotia, of which approximately 4% are PEVs, shown in Figure 10-12. Battery electric vehicles (BEVs) are expected to have higher market penetration than plug-in hybrid electric vehicles (PHEVs) with an 80/20 split in 2030.[21]

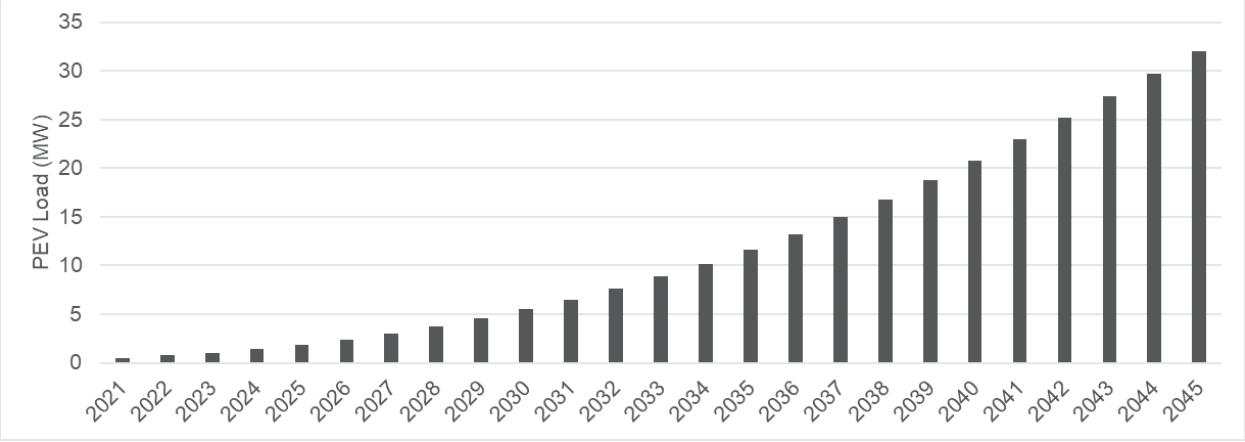
Figure 10-12. Vehicle Adoption Forecast from VAST™



Source: Navigant analysis

Load projections are estimated using a 0.6 kW/vehicle impact value from NSPI's 2019 Load Forecast report, which assumes that charging management programs will be in place. Figure 10-13 presents the forecasted load impacts from PEVs.

Figure 10-13. Demand Impacts from PEVs



Source: Navigant analysis, NSPI 2019 Load Forecast

[21] The decision to use EV forecasts using Navigant's VAST model was based on discussions with EfficiencyOne, and supported by Nova Scotia Power

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10.3 Characterization of Demand Response Options

Once the baseline peak demand projections were developed, the next key step in the DR potential assessment was to characterize the different types of DR options that could be utilized to curtail winter peak demand. Figure 10-14 summarizes the DR options included in the analysis. Figure 10-15 lists the sub-options that represent specific end uses and control technologies under the broad program types, referred to as DR options. The DR options are representative of the commonly deployed DR programs in the industry, including end use load curtailment through manual and automated methods, load shifting to behind-the-meter (BTM) batteries, control of EV charging, critical peak pricing (CPP), and behavioural demand response (BDR).

Figure 10-14. Summary of DR Options Considered in Study

DR Option	Brief Description	Eligible Customer Classes	End Use
DCL Direct Load Control	Control of electric loads by a thermostat and/or load control switch.	Residential Small Commercial Small Industrial	Electric Furnace[22] Heat Pump[23] HVAC[24] Hot Water
BNI Curtailment	Firm capacity reduction commitment. $/kW payment based on delivered capacity, administered through third party aggregators.	Large Commercial Large Industrial Interruptible	HVAC Lighting Water Heating Total Facility
BTM Battery Control	Use of batteries for load shifting and dispatching to the grid.	All classes	Batteries
EV Charging Control	Charging modulation to reduce EV demand during peak periods	EV	EV
Critical Peak Pricing (CPP)	A rate schedule with significantly higher peak prices to discourage consumption during peak times	All classes	Total Facility
Behavioral Demand Response (BDR)	Targeted notifications and incentives are provided to customers to encourage peak shaving	Residential	Total Facility

Source: Navigant

[22] Electric furnace and heat pump apply to residential. For small commercial and industrial, Navigant refers to the end use load type as HVAC.

[23] *Ibid.*

[24] *Ibid.*

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Figure 10-15. Summary of DR Sub-Options

DR Option	DR Sub-Option	End Use
DCL Direct Load Control	DLC-Thermostat-Electric Furnace	Electric Furnace
	DLC-Thermostat-Heat Pump	Heat Pump
	DLC-Thermostat-HVAC	HVAC
	DLC-Switch-Water Heating	Hot Water
BNI Curtailment	BNI Curtailment-Manual HVAC Control	HVAC
	BNI Curtailment- Auto-DR HVAC Control[25]	HVAC
	BNI Curtailment- Central Lighting Control	Lighting
	BNI Curtailment- Advanced Lighting Control	Lighting
	BNI Curtailment- Water Heating Control	Water Heating
	BNI Curtailment- Industrial	Total Facility
BTM Battery Control	BTM Battery Control	Batteries
EV Charging Control	EV Charging Control	EV
Critical Peak Pricing (CPP)	CPP with enabling technology	Total Facility
	CPP w/o enabling technology	
Behavioral Demand Response (BDR)	Behavioral Demand Response	Total Facility

Source: Navigant

The Direct load control (DLC) option is applicable to residential and small BNI. The sub-options included under this option target space heating and electric water heating. For residential customers, both heat pump and electric furnace heating controls using thermostats were considered, along with switch-based control for electric water heating. For small BNI customers, DR sub-options included similar control technology as residential.

The BNI Curtailment option represents demand reductions through control of a variety of end uses at customer facilities using a combination of manual and automated control mechanisms. This option applies to large BNI customers. BTM batteries are considered for all customer classes to shift facility load during peak demand periods. EV control includes reduction in EV load through charging interruptions during the peak demand period.

CPP applies to all customer classes and impact rate structures to shift usage away from peak hours in a year. The dynamic rate represented in this analysis is a Critical Peak Pricing (CPP) with a 6:1 critical peak to off-peak price ratio. The analysis considered impacts from CPP rates without any enabling technology and in combination with enabling technology (enabling technology refers to thermostats for residential and

[25] Automated Demand Response (Auto-DR) is a platform to automatically activate a pre-programmed load reduction strategy in response to a signal from a Demand Response Automation Server (DRAS). Load is curtailed by the customer's building management or Supervisory Control and Data Acquisition (SCADA) system after being triggered by a signal that is sent from NSP's control room to the vendor's operations center, and on to the customer's facility. Customer always retains the ability to override the curtailment sequence in the event a site cannot participate in a specific demand response dispatch. Auto-DR ensures higher reliability of response without manual intervention.

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small commercial and small industrial customers, and Auto-DR for the remaining customer classes). Industry experience suggests that the impact of the rate is enhanced when paired with enabling

technology. The study assumes an opt-in type of offer for CPP for the base scenario and requires customers to have a smart meter for them to be on the rate.[26] Hence the start year for the rate offer is 2022, after completion of smart meter deployment.

Behaviour DR (BDR) shares similar characteristics to the behavioural energy efficiency program offer, where customers are behaviourally motivated to reduce their energy use during peak demand periods through feedback on their performance and peer comparisons. BDR is assumed to be offered on an opt-in basis and requires smart meters.

10.4 Key Assumptions for Demand Response Potential and Cost-Effectiveness Assessment

The final step in Navigant's assumptions development process was to estimate programmatic inputs such as participation rates, unit load reductions and costs for the DR options (see Appendix C). These are key variables that feed the DR potential and cost calculations. These assumptions were based on similar DR potential studies and program performance data/information from DR programs in other jurisdictions, as well as professional judgement by Navigant. Figure 10-16 summarizes the key DR potential and cost estimation variables considered in this study. The DR analysis input assumptions, provided as Appendix C to the report, presents detailed documentation of the basis for these assumptions.

Figure 10-16. Key Variables for DR Potential and Cost Estimates

Key Variables	Description
Participation Rates	• Percentage of eligible customers enrolled in DR programs by DR Options, DR sub-options, customer class and building types • Participation ramp (rate at which the program ramps up to steady state participation over a specified period)
Unit Impacts	• kW reduction per device for DLC (residential and small BNI customers) • Percent of enrolled load by end use/total facility/battery for DLC (Large BNI customers), BNI Curtailment, BTM Batteries, and EV Control
Costs	• One-time fixed costs related to program development • One-time variable costs for customer recruitment and program marketing, equipment installation and enablement • Recurring fixed and variable costs such as annual program admin. costs, customer incentives, O&M, etc.
Global Parameters	Program Lifetime, Discount Rate, Inflation Rate, Line Losses, Avoided Costs [27]

Source: Navigant

[26] The DR analysis assumed "default with opt-out" type of offer under the High Scenario and the same opt-in type of offer for the low scenario. This is further discussed under the scenario descriptions later in this chapter.

[27] Generation and Energy avoided costs are from the 2014 Integrated Resource Plan for NS. The T&D costs were provided to EfficiencyOne by NS Power in 2018. An implicit assumption in this study is that the avoided costs developed for NSP's peak period definition is applicable to the peak definition used in this study. Navigant recognizes that this may not be the case, however it is out of scope of this study to redefine the avoided costs.

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Navigant calculated both technical and market potential associated with implementing DR programs for this study.

Technical potential refers to the theoretical maximum potential under 100% participation of the eligible load. Navigant calculated technical potential by multiplying the eligible load/customers by the unit impact for each sub-option. An important caveat is that, by definition, technical potential calculation does not consider participation overlaps. Technical potential across the various sub-options are not additive and should not be added together to obtain a "total" technical potential. Therefore, the technical potential estimates for each DR sub-option should be considered independently. The technical potential calculation is summarized through Equation 2.

Equation 2. DR Technical Potential

$$Technical\ Potential_{DR\ Sub\ Option,End\ Use,Year} = Eligible\ Load_{DR\ Sub\ Option,Segment,End\ Use,Year} * Unit\ Impact_{DR\ Sub\ Option,Segment,Year}$$

Navigant calculated achievable potential by multiplying achievable participation assumptions (subject to program participation hierarchy discussed below) by the technical potential estimates. Achievable potential also accounts for customer opt-out during DR events. The achievable technical potential calculation is summarized through Equation 3.

Equation 3. DR Achievable Potential

$$Market\ Potential = Technical\ Potential_{DR\ Sub\ Option,Segment,End\ Use,Year} * Achievable\ Participation\ Rate_{DR\ Sub\ Option,Segment,Year} * (1 - Event\ Opt\ Out\ Rate)_{DR\ Sub\ Option,Year}$$

In addition to the potential estimates, Navigant developed annual and levelized costs by DR options and sub-options and conducted cost-effectiveness assessment of these options and sub-options. Development of DR program annual and levelized costs involve itemization of the various cost components, such as one-time program development costs, DR-enablement costs, equipment costs, participant marketing and recruitment costs, annual program administration costs, O&M costs, and customer incentives.

10.4.1 Demand Response Base Case Assumptions

10.4.1.1 Participation and Hierarchy

Participation assumptions are based on review of similar programs offers and relevant secondary sources of information, such as publicly-available DR potential studies and evaluation reports from other jurisdictions and DR program databases such as the U.S. Federal Energy Regulatory Commission (FERC) National DR Program Survey database. [28] As mentioned previously, the accompanying Excel spreadsheet for DR assumptions provided to EfficiencyOne include detailed documentation of the participation assumptions (see Appendix C). The participation assumptions are developed by customer class and DR option, and represent steady-state participation levels after the program is fully ramped up. Based on standard industry assumptions, Navigant assumes a 5-year S-shaped ramp for the DR options. Therefore, these steady-state participation values are assumed to be reached after that ramp period.

[28] http://www.ferc.gov/industries/electric/indus-act/demand-response/dem-res-adv-metering.asp

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For achievable potential estimates, Navigant accounted for participation overlaps among different DR options offered to the same customer class through a participation hierarchy represented in Figure 10-17.

The participation hierarchy helps avoid double counting of potential through common load participation across multiple programs and is necessary to arrive at an aggregate potential estimate for an entire portfolio of DR programs. CPP is considered lower in the hierarchy than the incentive-based options[29]. The hierarchy order is based on the dispatchability of the options and the reliability around the load reductions, with the most reliable and dispatchable resource placed at the top and the least reliable resource at the bottom.

Figure 10-17. Program Hierarchy to Account for Participation Overlaps[30]

Level in Hierarchy	DR Option	Eligible Customers
1	BTM Battery Control	Customers with dispatchable batteries.
2	DLC (for Residential and Small BNI) or BNI Curtailment (Large BNI)	Customers without dispatchable batteries.
3	CPP	Customers without dispatchable batteries and not enrolled in DLC or BNI Curtailment.
4	Behavioural DR	Customers without dispatchable batteries and not enrolled in DLC or CPP

Source: Navigant

10.4.1.2 Unit Impact Assumptions

The unit impacts specify the amount of load that could be reduced during a DR event once customers are enrolled in a DR program. Unit impacts can be specified either directly as "kW reduction per participant" or as "% of enrolled load".

Only residential DLC impacts for space heating (both electric furnaces and heat pumps) are specified as kW reduction per device. All other unit impacts are specified as "% of enrolled load".

The model inputs data provided in Appendix C to the report presents the unit impact assumptions used for potential estimation and includes detailed documentation for the basis of these assumptions. For BNI Curtailment, unit impacts are developed by DR sub-option as the unit impact values are tied to the end uses and the type of control. For example, the load reductions associated with Manual HVAC control and Auto-DR HVAC control are different and are specified accordingly.[31]

[29] This assumption applies to the Base and Low scenarios. However, for the High scenario, where CPP is offered as a default rate with opt-out, it is placed at the top in the hierarchy.
[30] EV control is outside the hierarchy because it only applies to EVs.
[31] The unit impacts assume that DR events are called over a 3-hr. duration (based on 5-8 p.m. peak period determination). If NS Power would like to call events over a longer duration, it may be possible to recruit additional customers and stagger the dispatch in batches with 3-hr. dispatch duration for each batch. Moreover, if participants were to be dispatched in batches, the net load reduction would be uncertain given that the snapback effect from customers dispatched during the previous batch would nullify some of the load reductions from the batch being dispatched. The modeling framework used in this analysis does not incorporate these considerations.

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10.4.1.3 Program Costs and Related Assumptions for Cost-Effectiveness

Navigant developed detailed itemized cost assumptions for each DR option to assess annual program costs and calculate levelized costs for each option. These cost calculations feed into the cost-effectiveness assessment of DR options using the TRC test. The DR analysis input assumptions file presents detailed itemized cost assumptions used in this study and documents the basis for these assumptions.

The cost assumptions fall into the following broad categories:

- **One Time Fixed Costs**, specified in terms of $/DR option, which include the program start-up costs, including for example, the software and IT-infrastructure related costs, and associated labor time/costs (in terms of FTEs) incurred to set up the program.
- **One Time Variable Costs**, which include marketing and recruitment costs for new participants, and enabling technology costs associated with control and communications technologies to enable DR. The enabling technology cost is specified either in terms of "$/new participant" on a per site basis, or as "$/kW of enabled load reduction" on a participating load basis.[32]
- **Annual Fixed Costs,** specified in terms of $/year, which primarily includes FTE costs for annual program administration and ongoing IT related costs not included in the one-time fixed category above.
- **Annual Variable Costs,** which primarily includes customer incentives, specified either as a fixed annual incentive amount per participant ($/participant/yr.), or in terms of load reduction ($/kW reduction), depending on the program type. It also includes additional O&M costs that may be associated with servicing technology installed at customer premises.

Other than the itemized program costs, the key variables for cost-effectiveness calculations in the model are:

- **Discount rate** of 6.84% [33], used for Net Present Value (NPV) calculations.
- **Line loss** values between 4.5% and 14.7% depending on customer class, which is used to bring up the potential at customer meter to the generator for cost-effectiveness assessment.[34] [33]

For assessing the DR benefits, Navigant used the avoided wholesale capacity costs and avoided distribution transmission capacity costs from 2014 IRP, with 2018 estimate of transmission and distribution avoided costs from NSP. Figure 10-18 summarizes the benefits and costs considered in the cost-effectiveness assessment of DR options and sub-options.

Figure 10-18. Summary of Benefit-Cost Streams for TRC in DRSim™

Benefits	Costs	Transfer [34]
Wholesale Avoided Capacity Costs	Program Development Cost	Incentives
Avoided Transmission Capacity Costs	Program Administrative Cost	
Avoided Distribution Capacity Costs	Program Delivery Cost	
	Marketing & Recruitment Cost	
	Technology Enablement Cost	
	O&M Cost	
	Participant Cost	

[32] The enabling technology costs represents the incremental costs associated with controls and communications for making the device DR-enabled. These costs are not expected to decline meaningfully over time, and are modelled as being static.
[33] This is the 2019 NS Power WACC/AFUDC value from the WACC AFUDC Application.
[34] These are sourced from NS Power 2014 Cost of Service Study (COSS) - Exhibit 9A.

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The cost-effectiveness assessment takes a long-term perspective. Only DR options that had TRC benefit-to-cost ratios of 1.0 or greater were deemed cost-effective and included in the potential estimates. Chapter 11 presents cost-effectiveness results.

10.4.2 Descriptions of Scenarios and Related Assumptions

Navigant developed achievable potential estimates under three scenarios – base, high, and low. These scenarios represent variations in the following input assumptions:

- **Baseline peak demand projections**: The baseline peak demand projections for DR for the base, high, and low scenarios correspond to the base, mid, and low scenarios for the energy efficiency potential estimates respectively. The baseline peak demand projections are highest for the low scenario since the energy efficiency potential savings are lowest corresponding to that scenario. Similarly, the baseline peak demand projections for DR potential estimates are lowest under the high scenario (corresponding to the energy efficiency mid scenario). The base case baseline peak demand projections lie in between the low and high peak demand projections.

- **Saturation values for heat pumps:** A key input for estimating the DR potential for residential space heating are the saturation values for electric furnaces and heat pumps. The energy efficiency potential analysis provided variations in market adoption for heat pumps under the three scenarios (highest adoption of heat pumps under the high scenario for DR [35] and lowest adoption of heat pumps under the low scenario for DR [36]). These variations in market adoption from the energy efficiency potential analysis were fed into the saturation assumptions to calculate DR potential.

- **Programmatic assumptions:** In addition to these two input variations, the scenarios represent variations in the following programmatic assumptions, summarized in Figure 10-19. The high scenario drivers are higher incentives and higher marketing expenditures over the base scenario, which in turn result in higher enrollment in DR programs. Conversely, for the low participation scenario, enrollment in DR programs is lower than the base case due to lower levels of incentives and marketing expenditures. The percentage changes represented here are based on Navigant's industry insights from similar analysis in other jurisdictions. These percentages reflect that residential and small BNI customer participation in DR programs is more sensitive to variations in incentives and marketing spend than those for the larger BNI customers.

[35] The high scenario for DR corresponds to the mid scenario in the EE potential analysis.
[36] The low scenario for DR corresponds to the low scenario in the EE potential analysis.

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Figure 10-19. Summary of Changes in Programmatic Assumptions Across Scenarios

Scenario	Applicable Customer Class	% change in incentives over Base Case	% change in marketing costs over Base Case	% change in participation over Base Case
High	Residential	+50%	+50%	+15%
	Small Commercial, Small Industrial	+50%	+50%	+20%
	Large Commercial, Large Industrial, and Interruptible	+50%	No change	+10%
Low	Residential	-50%	-50%	-30%
	Small Commercial, Small Industrial	-50%	-50%	-40%
	Large Commercial, Large Industrial, and Interruptible	-50%	No change	-15%

Source: Navigant analysis

For CPP specifically, Navigant assumed that the CPP rate is offered as "default with opt-out" under the high scenario, while both base case and low scenario assume an opt-in type of offer for CPP. Consequently, under the high scenario, CPP is placed at the top of the participation hierarchy and other options apply to customers who opt-out of the CPP rate.[37] Additionally, under a default rate offer, the unit impacts for CPP are lower than unit impacts under opt-in type offer. This assumption is supported by findings from a database of pricing programs and pilots with different types of offers, developed by the Brattle Group.[38] Accordingly, the high scenario in this analysis assumes a lower unit impact for CPP than the base and low scenarios.

[37] Note that residential low-income segment customers are excluded from the CPP offer in all cases. CPP has a pretty steep critical peak to off-peak price ratio and unlikely to be offered to low-income customers for fear of penalization if these customers are not able to reduce demand during critical peak period.

[38] https://www.portlandgeneral.com/-/media/public/our-company/energy-strategy/documents/2016-02-01-demand-response-market-research.pdf

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11. DEMAND RESPONSE POTENTIAL AND COST-EFFECTIVENESS RESULTS

This chapter presents the DR potential and costs results based on the approach described in Section 10. Navigant presents detailed base case results at different levels of granularity by DR options, DR sub-options, customer classes, and building types. Under the base case, Navigant begins by providing a preview of the potential results before screening for cost-effectiveness using achievable participation rates. Next, Navigant presents cost-effectiveness results and the achievable potential associated with cost-effective options only at different levels of granularity. Under scenario analysis, Navigant indicates how the cost-effectiveness results change across scenarios and present potential and cost result comparisons across the scenarios.

Accordingly, this chapter presents the analysis results in the following order:

1. Base Case potential results for all DR options included in the analysis (before cost-effectiveness screening)
2. Base Case cost-effectiveness and levelized cost results for all DR options
3. Base Case potential results by DR options, DR sub-options, customer class and building type for cost-effective DR options only
4. Base Case annual cost results by cost-effective DR options
5. Scenario analysis results with comparison of cost-effectiveness and achievable potential results

In addition to these achievable potential results, Section 11.1 includes technical potential results from the analysis. Technical potential assumes 100% participation of eligible customers in DR options and represents the theoretical upper limit for potential. Since the technical potential assessment does not account for participation overlaps and a program hierarchy, the DR option potential estimates are not additive and therefore Section 11.1 presents standalone technical potential results for individual DR options.

Economic potential is not considered because the DR analysis operates differently from the EE analysis; it is not a system dynamics stock-turnover model but is rather based on programmatic assumptions specified in the input sheet. Economic potential in the EE analysis reflects whether a measure is economic in absence of a utility program or utility investment. However, DR measures would not exist without a utility program. Measures in DRSim are not competing for market share, so cost-effectiveness can only be considered at the program level.

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11.1 Demand Response Technical Potential Results

Navigant calculated the technical potential for implementing DR programs for this study. Technical potential refers to the theoretical maximum potential under 100% participation of the eligible load. Navigant calculated technical potential by multiplying the eligible load or eligible customers by the unit impact for each sub-option.

An important caveat is that, by definition, a technical potential calculation does not consider participation overlaps. **Technical potential across the various sub-options are not additive** and should not be added together to obtain a total technical potential. Therefore, the technical potential estimates for each DR sub-option should be considered independently. The technical potential calculation is summarized through Equation 4.

Equation 4. DR Technical Potential

$$Technical\ Potential_{DR\ Sub\ Option,End\ Use,Year} = Eligible\ Load_{DR\ Sub\ Option,Segment,End\ Use,Year} * Unit\ Impact_{DR\ Sub\ Option,Segment,Year}$$

Figure 11-1 shows technical potential results by DR Sub-Option. Savings for each customer class can be viewed in the "Technical Pot_Option" tab in the accompanying DR Results workbook (see Appendix D). There are two general trends for technical potential savings over time, depending on the customer class and DR option. For DR impacts based on % of load reduced, the savings trends will track the baseline peak forecast, and for DR impacts based on kW reduction per unit, the savings trends track the account forecast projections.

Figure 11-1. Technical Potential by DR Sub-Option



Source: Navigant analysis

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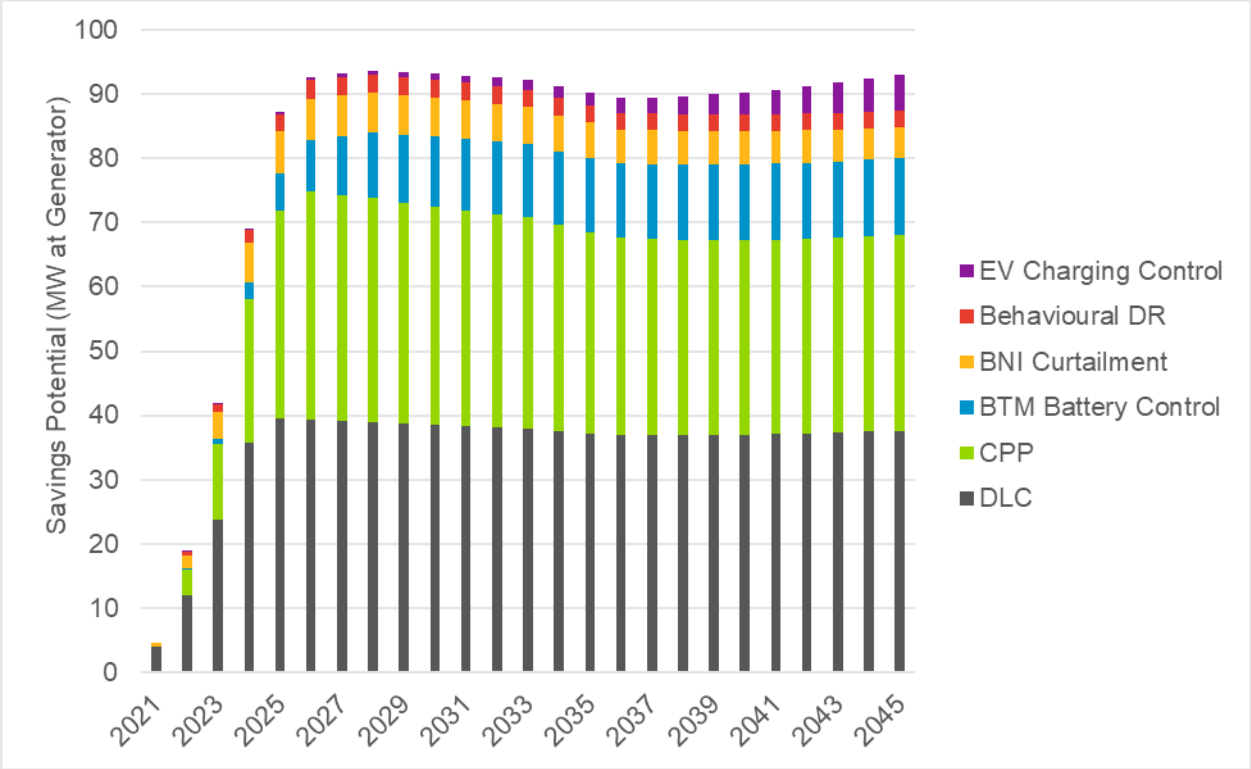
11.2 Demand Response Base Case Achievable Potential Results

This section presents achievable potential results for all DR options included in the analysis before screening for cost-effectiveness. The purpose is to provide the full spectrum of potential estimates for all DR options. Subsequent sections in this chapter will consider only the cost-effective DR options and provide a deeper dive into those potential results.

11.2.1 Achievable Potential Results by Demand Response Option

Figure 11-2 shows the MW breakdown of the DR achievable potential by DR option. Figure 11-3 shows the achievable potential as a percentage of Nova Scotia Power's peak demand. DR potential is estimated to increase to 93 MW by 2027 and settles to 92 MW by 2045. Under the base scenario, the achievable potential comprises more than 6% of Nova Scotia's peak demand in 2027 and reaches more than 7% by 2045 as the demand reduction impacts from the energy efficiency measures reduce the overall peak demand.

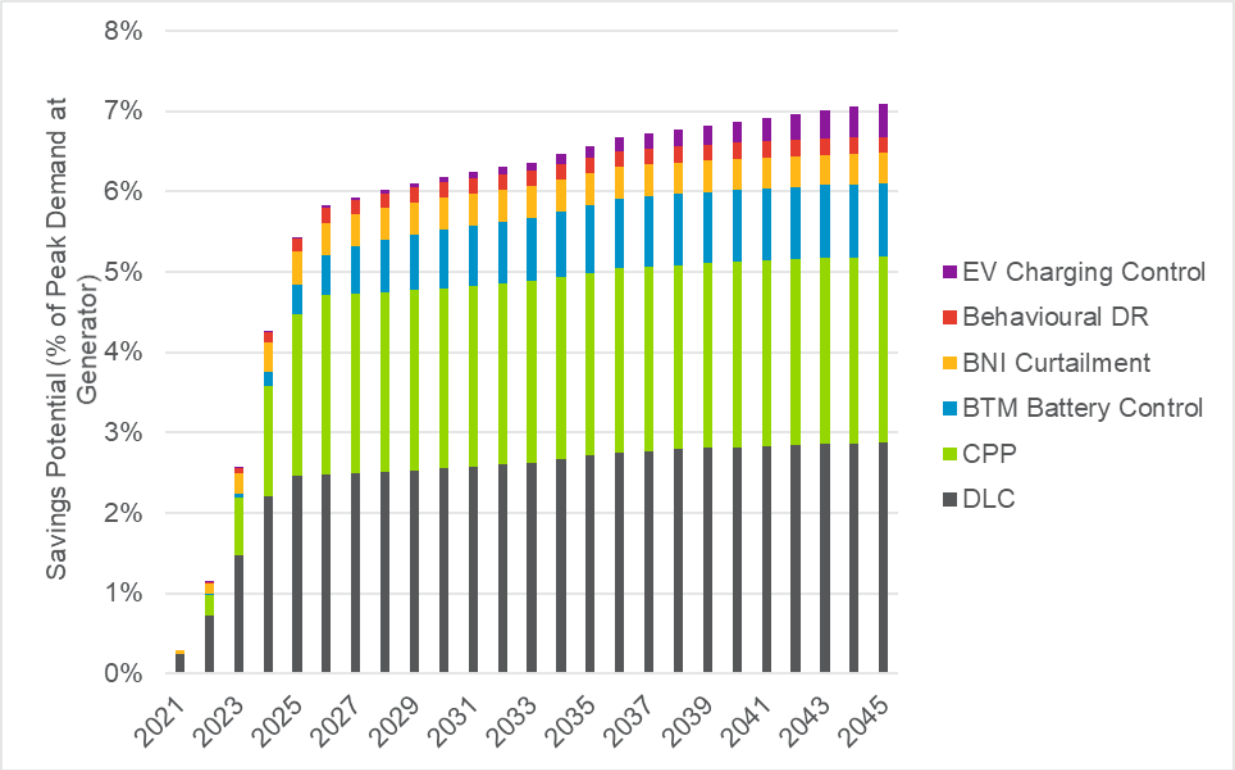
Figure 11-2. DR Achievable Potential by DR Option (MW at generator)



Source: Navigant analysis

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Figure 11-3. DR Achievable Potential by DR Option (% of Peak Demand)



Source: Navigant analysis

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11.3 Demand Response Base Case Cost-effectiveness Assessment Results

This section presents base case cost-effectiveness results by DR option based on the Total Resource Cost (TRC) test. Navigant also calculated the cost-effectiveness results based on the Program Administrator Cost (PAC) test.

11.3.1 Benefit-Cost Assessment by Demand Response Option

Figure 11-4 shows the TRC benefits, costs (in NPV 2020 dollars) and benefit-cost (BC) ratios calculated for each DR option, as well as the results from the PAC test. All DR options are cost-effective, other than Behavioral DR, BTM Battery Control, and EV Charging control. Benefit-cost ratios calculated using the PAC test tend to be lower because incentives are included as a cost, while the TRC considers incentives as a transfer payment. The benefit-cost ratios for CPP and BDR do not change across the cost tests because these DR options do not incur incentive costs.

Figure 11-4. DR Benefit-Cost Assessment by DR Option (TRC and PAC Test Benefit-Cost Ratios)

DR Option	Benefits (NPV 2020 million $)	Costs (NPV 2020 million $)	TRC Test Benefit-Cost Ratio	PAC Test Benefit Cost Ratio
CPP	65.05	25.23	2.58	2.58
DLC	81.47	66.60	1.22	1.06
BNI Curtailment	12.67	11.03	1.15	0.87
Behavioural DR	5.52	5.78	0.96	0.96
BTM Battery Control	19.17	22.91	0.84	0.73
EV Charging Control	3.05	11.08	0.28	0.26

Source: Navigant analysis

11.3.2 Demand Response Levelized Costs & Supply Curves

Figure 11-5 shows the levelized costs and the corresponding 2045 achievable potential for all DR options. The levelized costs consider the TRC costs and are calculated using the potential at generator. In terms of ascending order of levelized costs:

- CPP is the least cost option at $79/kW-yr., with 30 MW potential in 2045
- DLC follows at $173/kW-yr., with highest potential in 2045 at 38 MW
- BNI Curtailment ranks next at $185/kW-yr., with a much lower contribution than CPP (5 MW in 2045)
- BDR has the lowest potential among the DR options (2.6 MW in 2045), and costs around $221/kW-yr. This is not cost effective due to assumed low impacts.
- BTM charging control costs $247/kW-yr., and is not cost effective due to the high technology enablement costs
- EV charging control is significantly higher cost due to relatively high technology enablement costs and assumed low unit impacts from EVs during the peak period

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Figure 11-5. DR Base Achievable Scenario Levelized Costs vs. 2045 Potential (MW at generator)

DR Option	Levelized Costs ($/kW-yr.)	Achievable Potential (MW) (2045)	Cost-Effective Flag (DR Option)	Cumulative Cost-Effective Potential (MW) (2045)
CPP	$79.10	30.41	1	30.41
DLC	$173.03	37.58	1	67.99
BNI Curtailment	$184.92	4.89	1	72.89
Behavioural DR	$221.31	2.62	0	72.89
BTM Battery Control	$247.37	12.00	0	72.89
EV Charging Control	$755.88	5.44	0	72.89

Source: Navigant Analysis

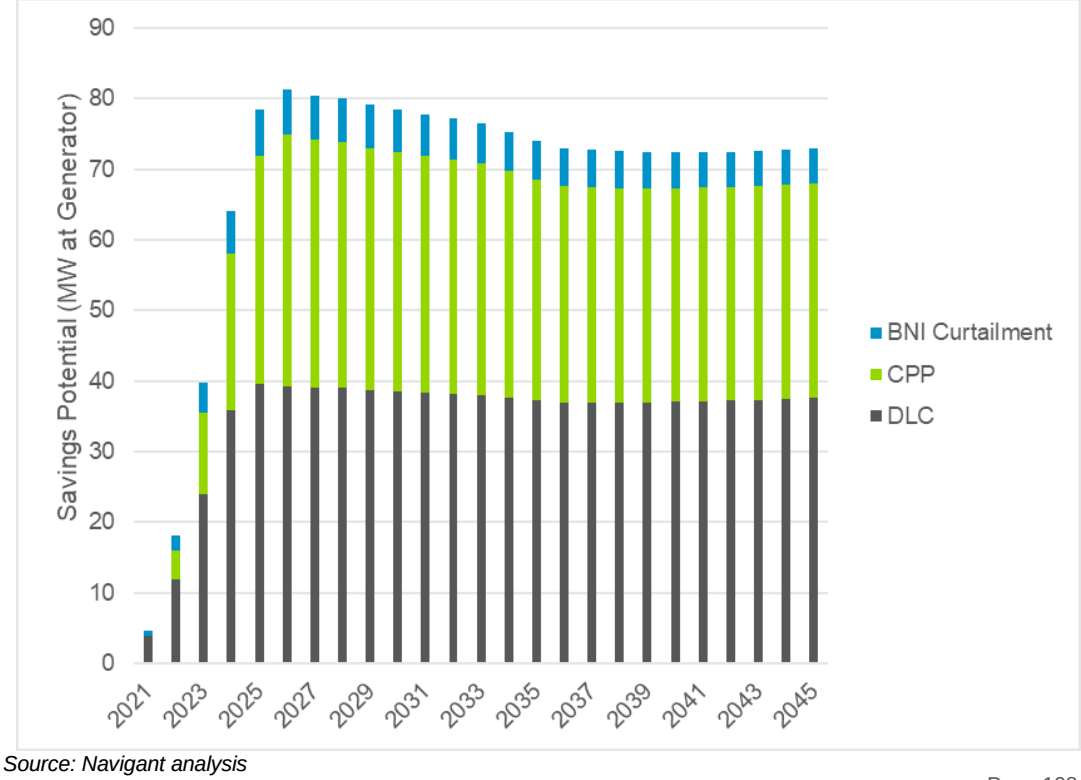
11.4 Cost-Effective Demand Response Achievable Potential Results

This section presents achievable potential results by DR options, sub-options, customer class, and building type for cost-effective DR options under the base case scenario.

11.4.1 Achievable Potential by DR Option for Cost-Effective DR Options

Figure 11-6 shows the MW breakdown of the DR achievable potential by cost-effective DR option.

Figure 11-6. DR Achievable Potential by DR Option for Cost-Effective DR Options (MW at generator)

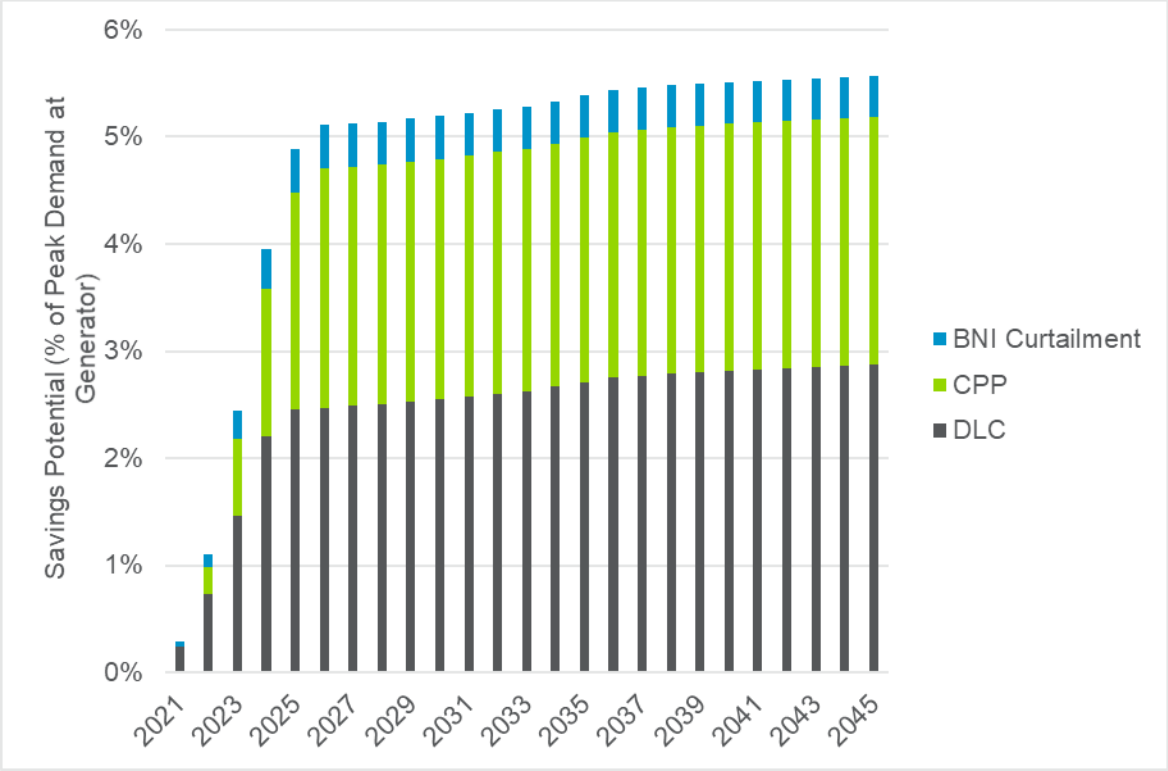


Source: Navigant analysis

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Figure 11-7 shows the achievable potential as a percentage of Nova Scotia Power's peak demand. The cost-effective DR potential under the base case is estimated to increase steadily to about 81 MW by 2026 and then declines and plateaus at about 72 MW from 2035 onward. The decline in potential is associated with the decrease in baseline peak demand for DR with progressively higher savings from energy efficient measures. Under the base scenario, the cost-effective achievable potential steadily increases to around 5% of peak demand in 2027 and remains steady thereafter in terms of percentage reduction in peak demand. DLC constitutes almost half of the total potential followed by CPP at 42%. BNI Curtailment share is significantly smaller at around 8%.

Figure 11-7. DR Achievable Potential by DR Option for Cost-Effective DR Options (Percent of Peak Load)



Source: Navigant analysis

11.4.2 Achievable Potential by DR Sub-Option for Cost-Effective DR Options

This section presents the breakdown of cost-effective potential by DR sub-option. Each sub-option is tied to a specific control technology and/or end use. Figure 11-8 shows the MW breakdown of the cost-effective DR achievable potential by DR sub-option. These results indicate the following:

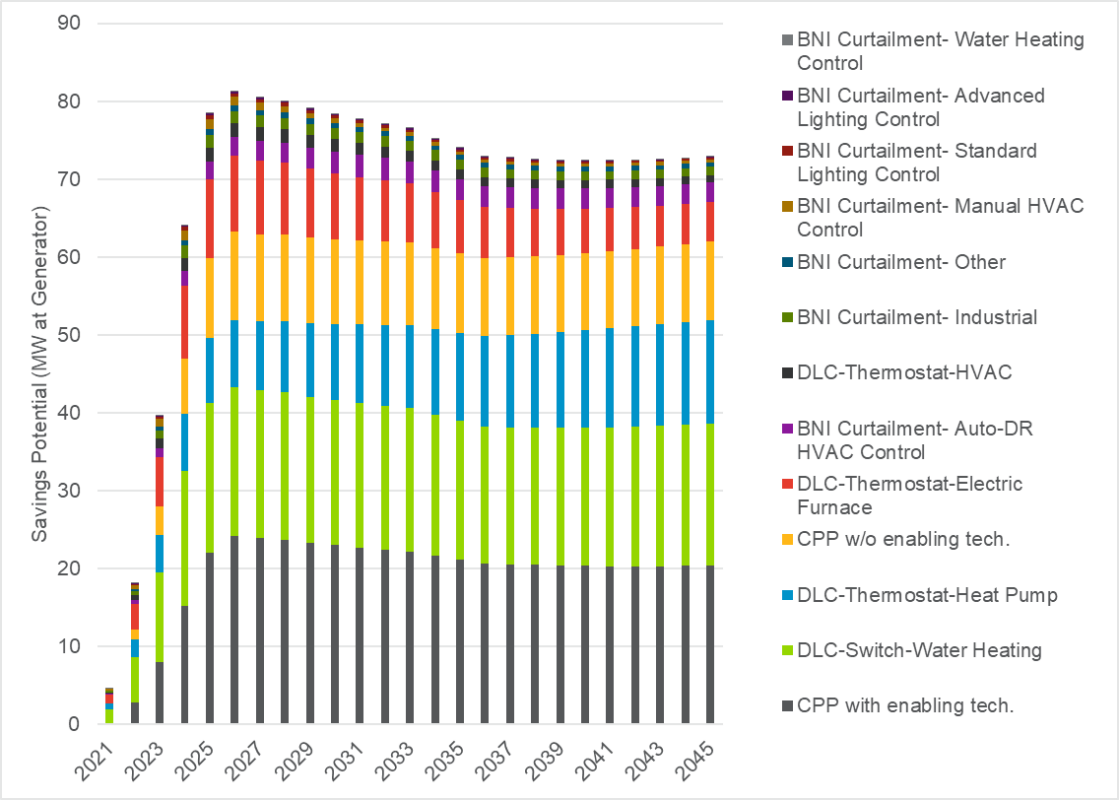
- Of the total CPP potential, potential from customers with enabling technology is almost double the potential from customers without enabling technology (20 MW in 2045 from customers with enabling technology vis-à-vis 10 MW from customers without enabling technology in 2045). As discussed previously, dynamic rates, coupled with enabling technology such as thermostats for residential and small BNI customers and Auto-DR for large BNI customers can significantly increase DR impacts.

- Direct load control of water heaters makes up the second highest potential, with 18 MW in 2045 (25% of total potential). Residential direct load control of heat pumps and electric furnaces each comprise 18% and 7% of the total 2045 potential, respectively, or 13 MW and 5 MW.

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- Under the BNI curtailment program, reduction associated with Auto-DR HVAC control comprise 2% of the total cost-effective potential in 2045. Industrial BNI curtailment comprises 1%. All other BNI programs comprise 1% or less of the total potential in 2045.

Figure 11-8. DR Achievable Potential by DR Sub-Option for Cost-Effective DR Options (MW at generator)



Source: Navigant analysis

11.4.3 Achievable Potential by Customer Class for Cost-Effective DR Options

This section presents the breakdown of cost-effect potential by customer class. As discussed in the methodology section, the six customer classes in this study are residential, small industrial, small commercial, large industrial, large commercial, and customers on the interruptible rider.

Figure 11-9 shows the MW breakdown of the cost-effective DR achievable potential by customer class, and reveals:

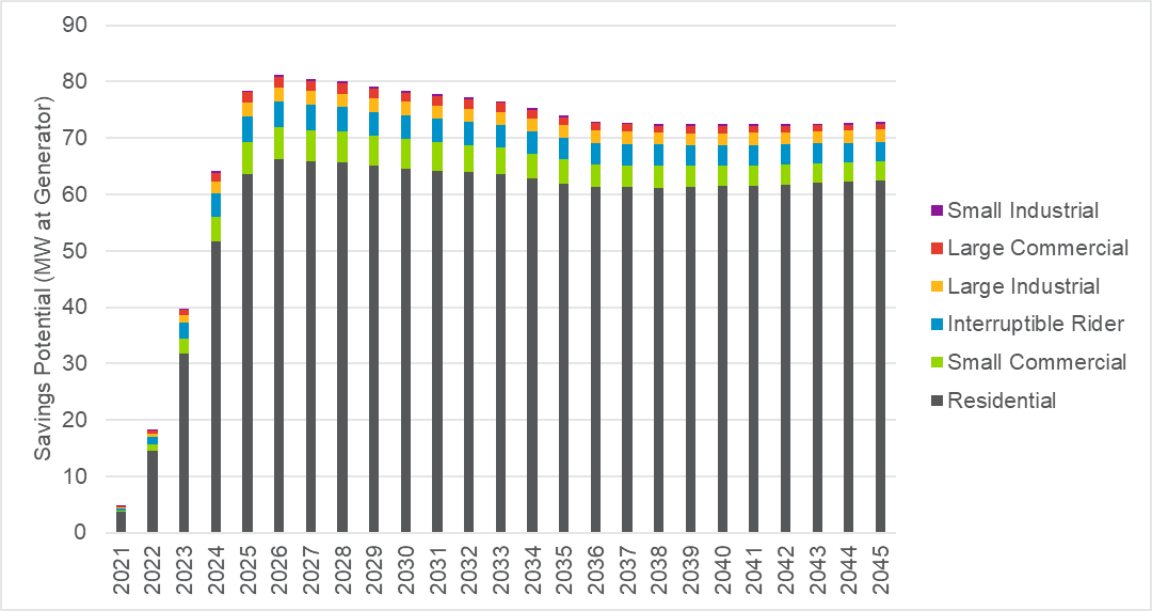
- Potential from residential customers makes up 62 MW or 86% of the total 2045 potential and is associated with DLC and CPP.

- Potential from interruptible rider, small commercial, and large industrial customers each comprise about 2 to 3 MW or 3% to 5% of 2045 potential. Interruptible riders were modeled in same manner as other BNI customer classes.

- Potential from large commercial and small industrial customers comprise 1 MW and 0.3 MW respectively or together comprise about 2% of the 2045 potential.

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Figure 11-9. DR Achievable Potential by Customer Class for Cost-Effective DR Options (MW at generator)

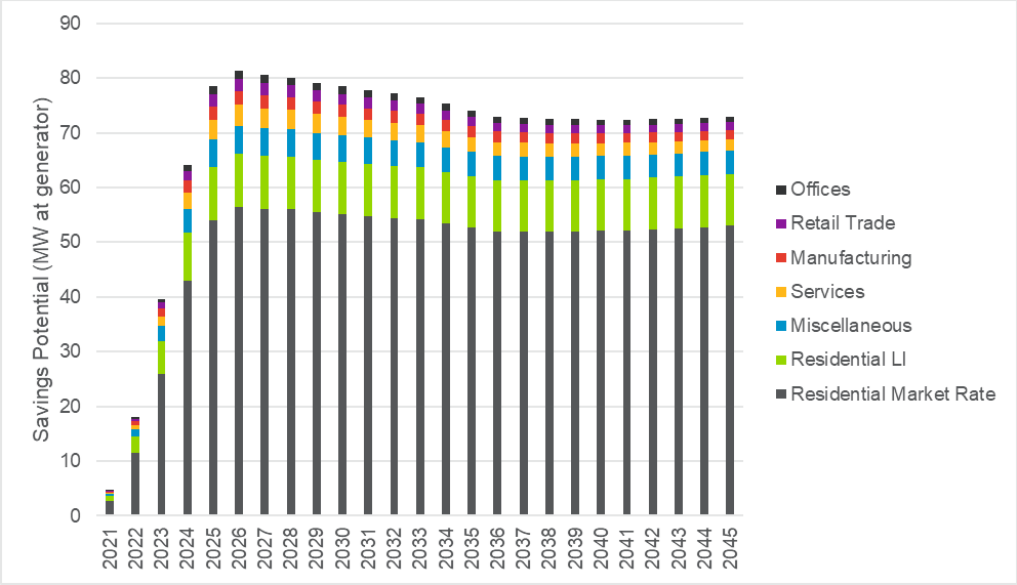


Source: Navigant analysis

11.4.4 Achievable Potential by Building Type for Cost-Effective Demand Response Options

This section presents the breakdown of cost-effective potential by building type or customer segment, shown in Figure 11-10. These results indicate that residential customers on market rate (all except low-income customers) comprise 73% (53 MW) of the total cost-effective achievable potential in 2045. This is followed by residential low-income at 13% of the total followed by the miscellaneous segment within BNI at 6% of the total 2045 potential. The contribution from other BNI segments range between 1% to 3% of the total potential.

Figure 11-10. DR Achievable Potential by Building Type for Cost-Effective DR Options (MW at generator)



Source: Navigant analysis

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11.5 Demand Response Investment Levels

Figure 11-11 summarizes the annual program investment for cost-effective DR options in the base case. Results indicate the following:

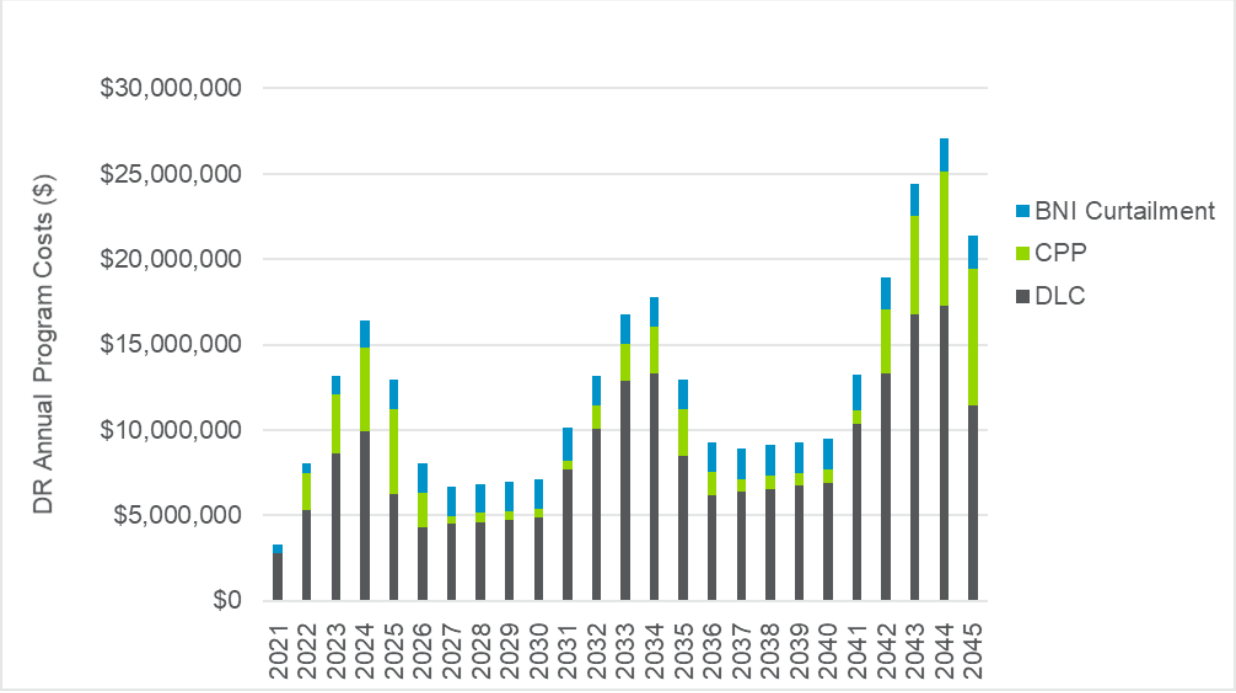
- The program investment for DLC increase steadily from 2021 to 2024 and then drop until 2026. The costs remain steady and then spike back up in 2031 because the DLC program has a life of 10 years, so technology enablement and program development costs are re-incurred at this time. From then on, costs fluctuate in accordance with program participation, which is tied to the saturation of the end-use devices (heat pumps, electric furnace, water heating), until it reaches 2041, when the program costs are re-incurred again. The two main cost components for DLC are the control equipment cost (thermostats and switches) and customer incentives for DR program participation.

- CPP program investment is relatively high during its initial ramp up between 2023 to 2026, and then drop in 2027-2028 when the program is fully ramped up. Beyond 2028, costs remain low and relatively stable. Enabling technology costs for customers that are offered the rate in conjunction with enabling technologies is a major cost component. Other significant costs are marketing and outreach to customers to enroll them in rates.

- The investment for BNI curtailment is tied directly to the potential estimates as majority of the program costs are rolled into an aggregator payment and represented as a delivery cost in terms of $/kW-yr.

- Behavioural program investment is fairly low and consistent once the program is fully ramped by 2026.

Figure 11-11. DR Annual Program Costs by DR Option for Cost-Effective DR Options ($)



Source: Navigant Analysis

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11.6 Demand Response Scenario Analysis Results

As described in methodology section, in addition to the base case, Navigant modeled potential results for low and high cases. For these cases, Navigant adjusted assumed participation levels, incentive amounts, marketing spending, and equipment saturation to determine the impacts on the DR achievable potential. The peak demand forecasts also varied by case as these were tied to the different demand reduction scenario impacts from the energy efficiency potential study.

11.6.1 Comparison of Cost Results Across Demand Response Scenarios

Figure 11-12 shows the cost-effectiveness results by DR option for the three scenarios. The net present value (NPV) of benefits and costs is shown in 2020 dollars. Ratios under 1.0 are considered not cost-effective. As is evident from the results, DLC and BNI Curtailment are not cost-effective under the high scenario. This is due to the assumption that CPP will be opt-out, meaning that it will be placed at the top of the hierarchy in the model and will capture the greatest number of customers. Since there are fewer participants in DLC and BNI, the fixed costs render these two options non-cost-effective. Only CPP and BDR are cost-effective in the high scenario. The selection of cost-effective DR options remains the same for base and low scenarios.

Figure 11-12. DR Cost-Effective Results by DR Options and by Scenarios

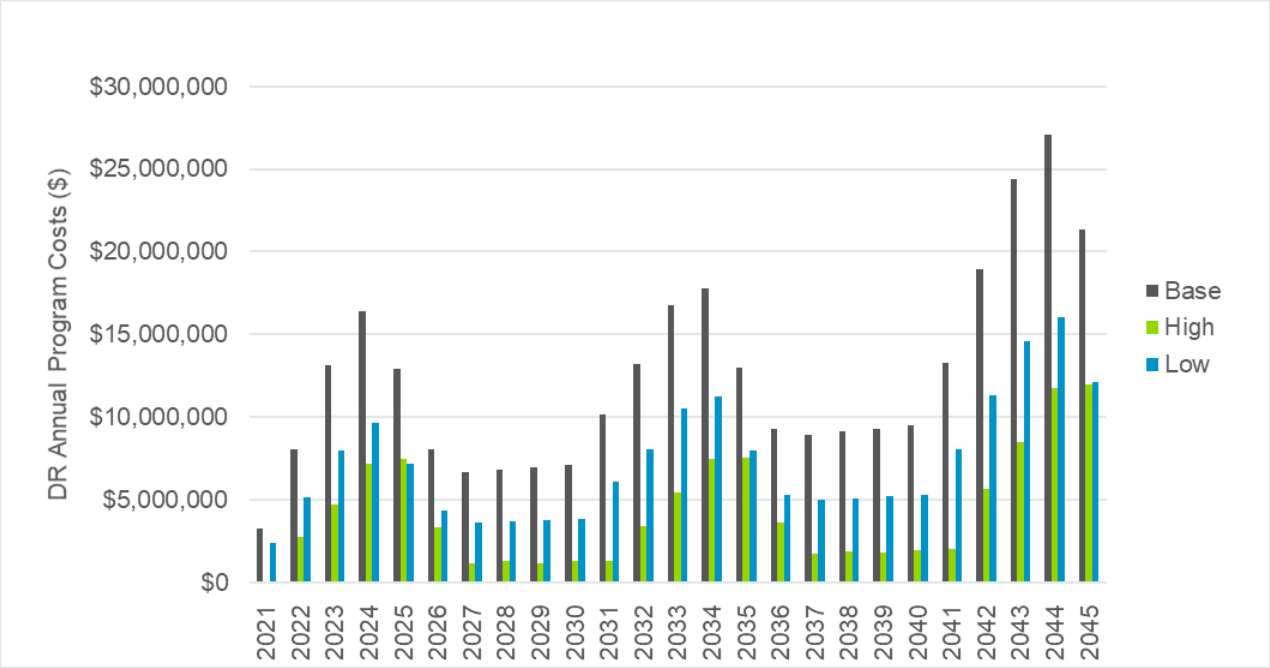
Case	DR Option	Benefits (NPV 2020 million $)	Costs (NPV 2020 million $)	TRC Test Benefit-Cost Ratio
Base	CPP	65.05	25.23	2.58
Base	DLC	81.47	66.60	1.22
Base	BNI Curtailment	12.67	11.03	1.15
Base	Behavioural DR	5.52	5.78	0.96
Base	BTM Battery Control	19.17	22.91	0.84
High	CPP	177.98	36.08	4.93
High	Behavioural DR	8.13	8.17	1.00
High	DLC	39.46	43.56	0.91
High	BNI Curtailment	9.47	10.21	0.93
High	BTM Battery Control	5.53	9.54	0.58
High	EV Charging Control	3.36	12.30	0.27
Low	CPP	49.53	14.85	3.34
Low	DLC	58.60	43.31	1.35
Low	BNI Curtailment	11.37	8.61	1.32
Low	Behavioural DR	4.49	4.81	0.93
Low	BTM Battery Control	13.49	15.38	0.88
Low	EV Charging Control	3.05	10.72	0.28

Source: Navigant Analysis

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Figure 11-13 compares the annual cost results across the three scenarios. Due to DLC and BNI Curtailment becoming not cost-effective in the high scenario, annual program costs are lower in the high scenario than the base scenario. High scenario costs are only associated with CPP and behavioural DR. The low scenario costs are smaller than the base scenario costs due to lower participation levels and lower per participant incentives and marketing costs.

Figure 11-13. DR Annual Portfolio Costs by Scenarios for Cost-Effective DR Options[39]



Source: Navigant Analysis

Based on cost-effectiveness screening, the annual portfolio costs are expected to increase from:

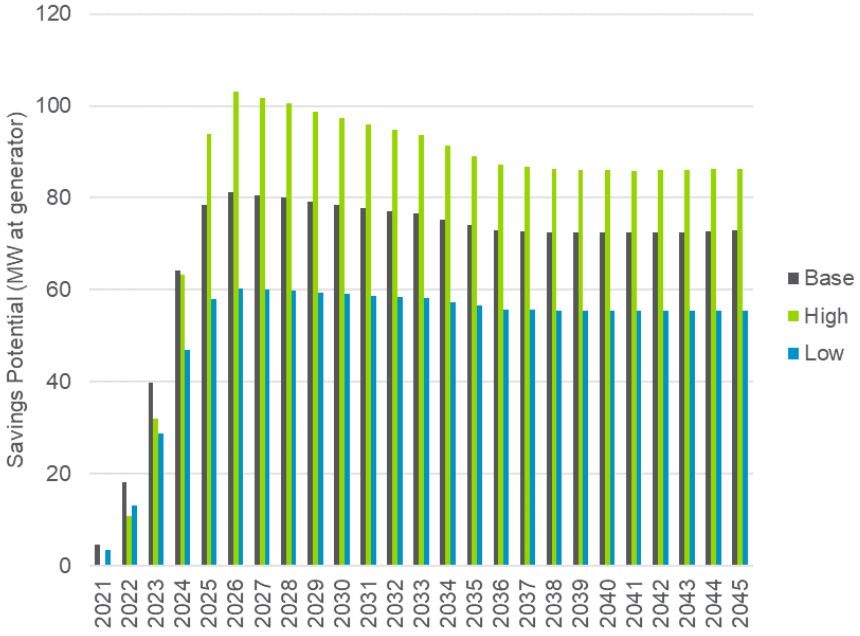
- $3.3 million in 2021 to $21.4 million in 2045 for the base scenario
- $2.7 million in 2022 to $12.0 million in 2045 for the high scenario
- $2.4 million in 2021 to $12.1 million in 2045 for the low scenario

11.6.2 Comparison of Potential Results Across Scenarios

Figure 11-14 and Figure 11-15 show a comparison of the potential results across the three scenarios. The achievable potential under the high scenario is 18% greater than the base scenario potential, while the low potential is approximately 24% lower than the base case potential. The 2045 potential under the low, base, and high scenarios represent approximately 4.0%, 5.6%, and 6.9% of NSP's peak demand in 2045, respectively.

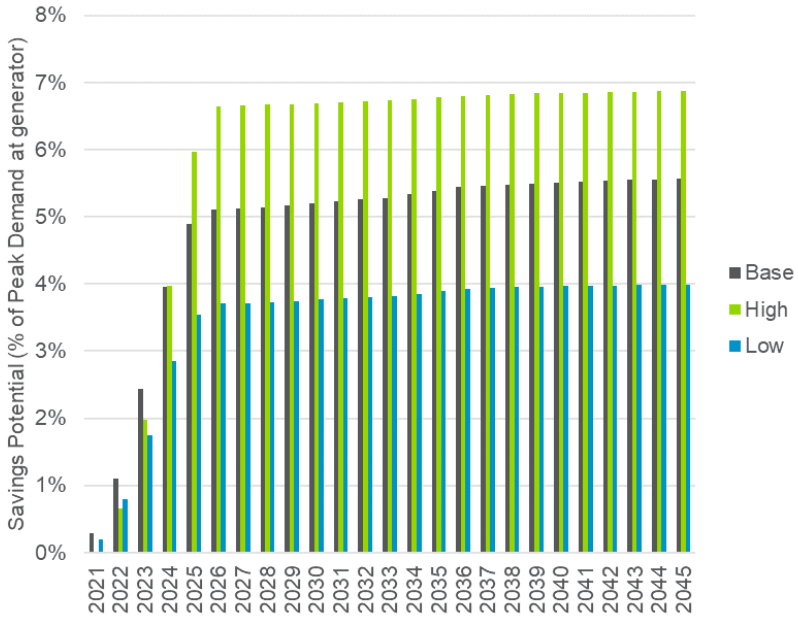
[39] DR options were screened at their respective scenario inputs using the Total Resource Cost Test.

Figure 11-14. DR Achievable Potential by Scenario (MW at generator)



Source: Navigant Analysis

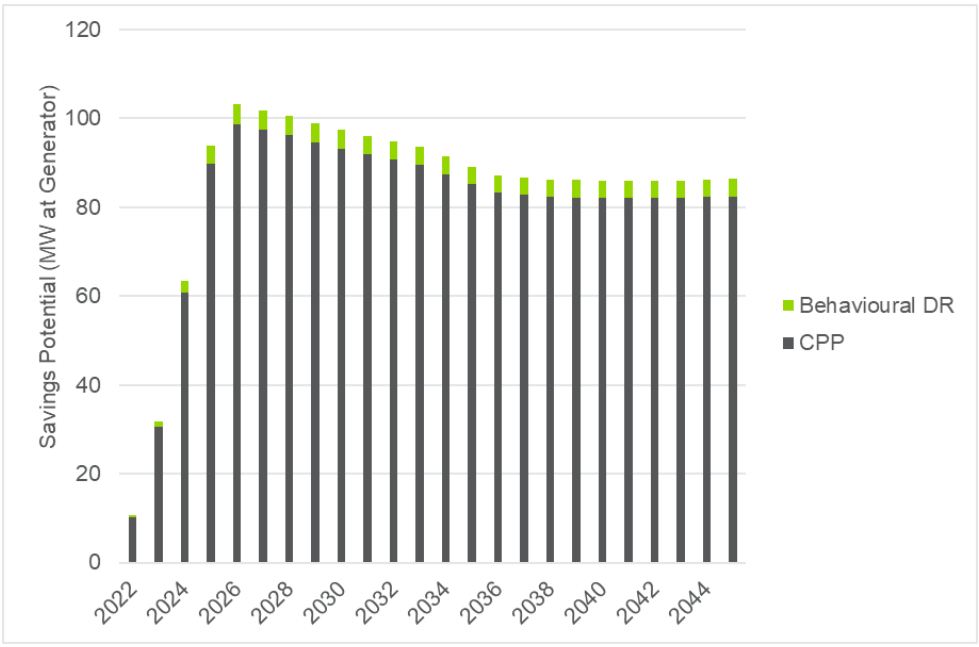
Figure 11-15. DR Achievable Potential by Scenario (Percent of Peak Demand)



Source: Navigant Analysis

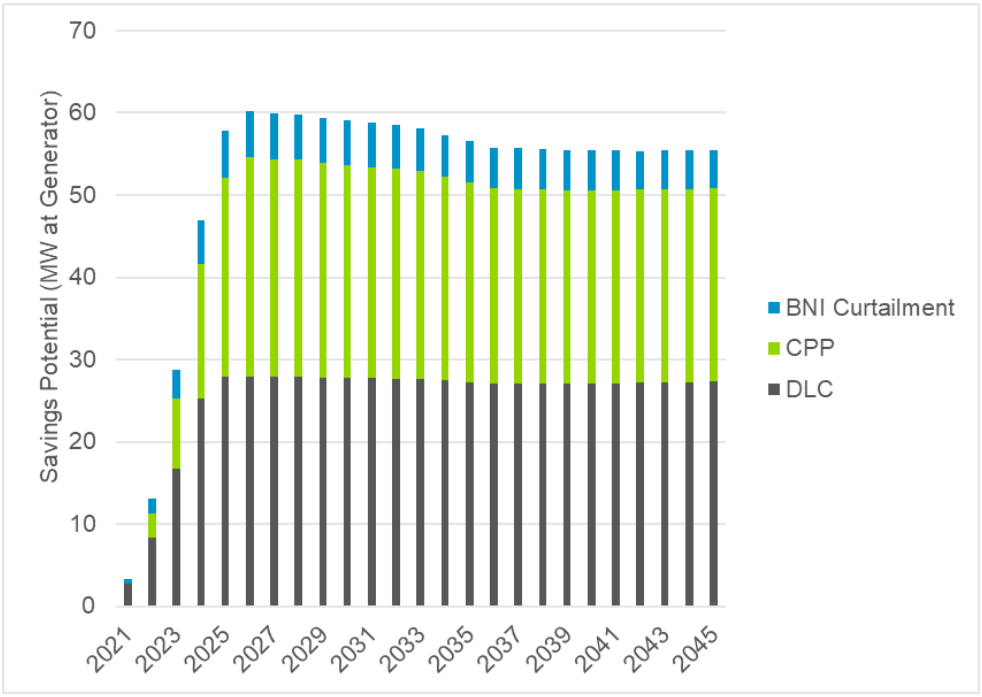
Figure 11-16 and Figure 11-17 present DR Achievable Potential for the High and Low scenarios by DR option. Default CPP in the high scenario accounts for more than 95% of the total potential. The trend for the low scenario is the same as that for base with lower contribution from all DR options.

Figure 11-16. DR Achievable Potential by DR Option, High Scenario, (MW at generator)



Source: Navigant Analysis

Figure 11-17. DR Achievable Potential by DR Option, Low Scenario, (MW at generator)



Source: Navigant analysis

11.7 Demand Response Snapback Effects

The previous discussions on potential estimates only included demand reductions during the DR event period. For DLC programs, typically, where the end use load is being directly controlled either through a switch or a thermostat, a snapback effect is commonly observed after the DR event ends. This arises because customers may increase the thermostat set point temperature for electric space heating almost immediately after the event period to make up for the loss of heat in their homes during the DR event period. Impact evaluation of DLC programs typically include snapback estimates and provide insights on snapback effects from these studies.[40] Navigant's industry experience in this area indicates that for central furnaces and heat pumps, the snapback magnitude during evening peak hours may be the same or even greater than the DR evening peak demand reduction as customer demand increases during the evening hours.

There are differences in snapback estimates between different types of space heating equipment. For example, for heat pumps, the snapback may be much more pronounced than for central furnaces. For a two-stage heat pump, the compressor operates above a certain ambient temperature to supply electric heat. But below that temperature, the compressor is no longer able to supply heat and the remaining heat is supplied by a resistance heating element, referred to as heat strip. Snapback could potentially be exacerbated because when the heat pump is cycled off for a curtailment event, the electric heat strips may then be more likely called into operation after the curtailment event. This is because the temperature differential (current vs. desired) is now greater than it would be had the heat pump been operating normally during the time of the curtailment event and the heat strips come into action since the ambient temperature is too low for compressor operation. This could potentially lead to significantly higher electricity use during the post event period for customers with heat pump. This phenomenon is not firmly established and requires additional research. Evaluation of other DLC programs indicates that there is no net increase in electricity use for customers with heat pumps because even though the snapback may be quite pronounced immediately following the event, it is likely to last for a short period. Therefore, the average snapback magnitude over a post-event period that has the same duration as the event period is likely lower than the average event period impact, alleviating concerns related to net increase in electricity use for participants with space heating control. In situations where customers might use gas and other supplemental fuels for heating, snapback effect could be mitigated by some of the other fuel types being used for heating during the event period.

For water heating load control, some pilots/programs observed greater snapback impacts than event period impacts in the evening. Although counter-intuitive, a reasonable explanation is that even when hot water is not being used, water heaters will suffer from modest stand-by losses to maintain the water set-point temperature. These stand-by losses tend to be quite small, and not coincident across households. However, all that standby consumption isn't averted, but merely shifted to the snapback period when the hot water tank is re-activated. That is, the stand-by consumption that would otherwise have been spread evenly over the event duration is aggregated into a single hour following the event, resulting in a substantially high snapback effect. However, the snapback is observed to last over a very short period. Some impact studies report the snapback during the one hour, 10 to 15 minutes following the DR event, to be almost double the average DR event period impact. However, the average snapback magnitude over the same duration as the event is expected to be lower than the average impact during the event period, alleviating concerns related to net increase in electricity use due to snapback.

[40] The Navigant team for this study referred to impact evaluation studies conducted by Navigant to draw on insights related to snapback.

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12. CONCLUSION

This study has resulted in updated, expanded, and improved information on the Nova Scotia customer base and the potential for energy and demand reductions possible through energy efficiency and demand response programs and initiatives. While much energy efficiency (and demand response) potential remains, there are unique challenges in Nova Scotia in realizing this potential over the next 25 years.

12.1 Energy Efficiency

- **Near-term Electricity Savings:** The majority of near-term savings are from the Res HVAC, Res Lighting, and BNI Lighting end uses. Residential screw-in LED Bulb ranks as the highest electricity-saving market potential measure for the residential sector while custom energy efficiency leads BNI.
- **Near-term Winter Peak Demand Savings:** The majority of near-term winter peak demand saving measures come from the Res HVAC, Res Lighting, and BNI Lighting end uses. Residential whole home ranks as the highest demand-saving market potential measure for the residential sector. Custom energy efficiency leads the BNI sector.
- **Prior Energy Efficiency Success:** EfficiencyOne has effectively implemented energy efficiency programs in Nova Scotia for a decade, often exceeding goals in terms of the amount of savings achieved. As greater levels of energy efficiency are implemented in Nova Scotia and market saturation increases, it may become more challenging to harvest additional savings represented in the energy efficiency potential.
- **Significant Energy Efficiency Measure Saturation and low Net-to-Gross Ratios:** These reduce the available savings potential, particularly for efficient lighting.
- **Codes and Standards:** The challenge of continuing to capture savings from energy efficiency programs within an increasingly saturated market is exacerbated by tightening codes and standards, particularly as a result of federal lighting standards and the latest building energy codes.
- **Residential HVAC Fuel Switching:** The residential savings potential, specifically demand, is dominated by HVAC technologies. High technical and economic potential are attributed to HVAC fuel switching measures that completely remove the end-use load from a home. Although still a significant portion of potential, achievable results indicate that efficient electrification technologies, such as air source and mini-split heat pumps, are the primary drivers of future HVAC savings potential. Therefore, although fuel switching measures present a great technical opportunity for electricity and demand reduction, there are significant market barriers to customer adoption.
- **Changing Energy Efficiency Measure Costs:** Changes to the portfolio measure mix that occur due to market saturation and codes and standards changes drive incremental costs upward for many measures. More complex measures, such as advanced lighting design, luminaire level lighting controls (LLLCs) and networked/connected lighting controls, may require a more sophisticated workforce, additional training, as well as increased installation and configuration time, compared to static non-controllable lighting measures. This could result in increased incremental costs for these types of measures.

12.2 Demand Response

- **Critical Peak Pricing and Direct Load Control Dominate**: Over the 25-year period, more than 90% of the base case achievable potential savings are projected to be provided by the CPP and DLC sub-options. The remaining savings are estimated from BNI curtailment.

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- **Collaboration to Achieve Savings:** The assessment of demand response identifies several DR options for the province that can provide significant demand savings over the 25-year time horizon. To realize the potential savings will require coordination between NS Power and EfficiencyOne.

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APPENDIX A. Final Modelling Plan

Modelling Plan for Nova Scotia Energy Efficiency and Demand Response Potential Study

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EXECUTIVE SUMMARY

This document presents an overview of the modelling methodology and approach for two Nova Scotia studies currently under development by Navigant for EfficiencyOne (E1):

1. Energy Efficiency (EE) Potential Study for the 25-year period 2021 to 2045
2. Demand Response (DR) Potential Study for the 25-year period 2021 to 2045

The main objective of the studies is to identify and quantify electricity and/or demand savings and the associated costs from energy efficiency and demand response actions, disaggregated by sector, segment, and end use. The two studies will provide data and analysis to inform the development of Nova Scotia Power's (NSP) next Integrated Resource Plan (IRP).

The purpose of this Modelling Plan is to provide an overview and details of the proposed methodology and approach to each study, to ensure alignment of expectations between Navigant and EfficiencyOne, and to inform stakeholders regarding the methodology, activities, deliverables, and timelines related to the EE and DR studies being conducted.

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1. Overview of Modelling Approaches

On behalf of E1, Navigant will employ two separate Analytica-based models[1] to assess the potentials for EE and DR in Nova Scotia. The model inputs and outputs will be provided in Excel, to facilitate inspection by EfficiencyOne, regulatory intervenors and the Nova Scotia Utility and Review Board (UARB).

1.1 Energy Efficiency Potential

Navigant's Demand-Side Management Simulator (DSMSim$^{TM)}$ model, a transparent conservation and demand-side management potential tool, will be used to carry out the EE potential analysis. We have used this tool to conduct dozens of potential studies across North America and will customize the model to meet the requirements of this study. The DSMSim^{TM} model will estimate incremental and yearly total annual impacts of energy and peak demand savings for multiple scenarios, to be agreed upon with E1. Scenarios will be developed in conjunction with E1 and stakeholder feedback will be considered. Draft final scenarios will be communicated to stakeholders on 05/24/2019, as part of the scenarios/sensitivities and detailed assumptions package. Due to budget and timeline constraints, a maximum of five scenarios will be considered, one of which will be maximum achievable.

The DSMSim^{TM} model accepts detailed inputs, such as the densities and saturations of measures and customer awareness and willingness factors (that drive market adoption) to adopt measures. The DSMSim^{TM} model adheres to all the current best practices in the evaluation industry including those listed in Figure 1.

Figure 1. DSMSim^{TM} Model – Key Features

• Option to use cost test protocols outlined in the 2001 California Standard Practice Manual (CASPM) or the subsequent 2007 revision[2] to the CASPM; or the 2017 National Standard Practice Manual[3] by the National Efficiency Screening Project
• Allows analyst to define custom cost test definitions
• Rigorous treatment of early-retirement measures, including dual baselines and deferred replacement credits[4]

[1] For more information, see http://www.lumina.com/why-analytica.

[2] California Public Utilities Commission. 2007. "2007 SPM Clarification Memo." Note the SPM has additional provisions for demand response/reduction measures, which are included in Navigant's DSMSim model.

[3] National Efficiency Screening Project, 2017. "National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources, Edition 1 Spring 2017.

[4] For discussion of proper evaluation of early retirement measures, see Rachel Brailove, John Plunkett, and Jonathan Wallach. "Retrofit Economics 201: Correcting Commons Errors in Demand-Side Management Cost-Benefit Analysis." Resource Insight, Inc. Circa 1990.

- Ability to handle avoided costs, retail rates, and load shape profiles at multiple levels of granularity (monthly, seasonal, annual, on/off peak)
- Handles any number of measures, programs, sectors, program periods and savings types (electricity/demand, gas, water, emissions, etc.)
- Cost-effectiveness can be evaluated at annual, bi-annual, quarterly, or monthly intervals
- Results based on planned input assumptions (incentives, administrative costs, non-energy benefits, participation, etc.) can be compared against those derived from actual values after program implementation is finalized
- If hourly load shapes are available, the model generates daily load shape profiles by day type (peak day, weekday, weekend/holiday) for baseline consumption, efficient consumption, and the resulting efficient savings
- Treats recurring incentives and administrative costs, which are common in demand response programs
- Includes an option to assign program-level administrative costs to measures within the program, while ensuring the selected cost test ratio remains above 1.0 (or a designated threshold) for each measure
- Can easily switch between net and gross savings and cost-effectiveness results
- Provides cost-effectiveness metrics at the measure, program, sector, portfolio, end use or building type level, including combinations of these levels of granularity
- Powerful sensitivity and scenario analysis capability to identify key assumptions and largest leverage points
- Provides histograms of top-saving measures, scatter plots to view savings versus costs, and supply curves
- Input data is imported from an Excel spreadsheet for portability, version control, and scenario analysis
- All summary results and intermediate calculations are immediately available in tabular or graphical form and can be exported to Excel

As a starting point, the analysis will incorporate data from the 2020-2022 DSM Plan recently submitted to the UARB for approval, as well as inputs to the 2018 Potential Study Update. Navigant will address approximately 350 energy efficiency measures [about 100 in the residential sector, and 250 for the business, non-profit, and institutional (BNI) sector] across Efficiency Nova Scotia's (ENS) portfolio as a starting point for the potential study analysis, and target a program Total Resource Cost test threshold of 1.0. Economic potential will be screened with a measure passing at 1.0 total resource cost (TRC) test. Achievable potential measures will be included with benefit/cost of 0.7 TRC or greater. We also will further consider whether a measure should or should not be included in the achievable potential. As needed, we will update the DSM Plan measures, but expect this will be done only in instances where either new information is provided, or a new measure is added compared to the recent measure set developed.

1.2 Demand Response Potential

To determine the various levels of DR achievable potential, Navigant's Demand-Response Simulator (DRSim™) model will simulate the enablement and utilization of DR options, costs, and interactions given user-defined deployment trajectories. The model will estimate DR potential, leveraging data and insights from previous E1 DSM research efforts. Programs that will be considered for the analysis include direct load control, peak time rebates, interruptible/curtailable, and behind the meter batteries.

1.3 Introduction to DSMSim and DRSim Models

Navigant's Analytica-based Demand-side Management Simulator (DSMSim$^{TM)}$ model will be used to develop the energy efficiency potential analysis. Navigant's Analytica-based DRSim^{TM} model will be used to conduct the demand response potential analysis. To facilitate inspection by EfficiencyOne, regulatory intervenors and the UARB, the model inputs and outputs will be provided in Excel.

2. Approach to Potentials

2.1 Approach to Energy Efficiency Potential

The EE analysis will assess three potentials (1) technical, (2) economic, and (3) achievable. The achievable potential will analyze multiple savings scenarios, including maximum achievable. Scenarios will be developed in conjunction with E1 and stakeholder feedback will be considered. Draft final scenarios will be communicated to stakeholders on 05/24/2019, as part of the scenarios/sensitivities and detailed assumptions package. Due to budget and timeline constraints, a maximum of five scenarios will be considered, one of which will be maximum achievable. Navigant will undertake the following steps to develop our estimates of potential savings:

EE Potential Step 1: Develop base year, define customer segments, define end uses, model base year consumption, develop reference case, compile global assumptions

EE Potential Step 2: Develop disaggregated energy sales forecasts for Nova Scotia for the period 2021-2045 (25 years), with forecasts broken out by customer segments and end uses

EE Potential Step 3: Define and characterize energy efficiency and demand response measures, and screen measures for cost-effectiveness

EE Potential Step 4: Calculate potential savings for all measures, with technical, economic and achievable potential for 2021-2045 (25 years)

The specific activities involved with each step are detailed in the following sub-sections.

2.1.1 Steps 1 and 2: Develop Baseline Energy Use, End Use Saturation, and Sales Forecast

The market characterization (including determining baseline energy use and end use saturation), will be one of the most critical aspects of the potential study. Market characterization will be the starting point for the development of the base year calibration and the reference case forecast. The measure inputs will be used to populate and develop the base year calibration, the reference case forecast, and the DSMSim™ model. Figure 2 outlines the key input parameters used to develop the reference case forecasts.

Figure 2. Data Collection Granularity for Base Year / Reference Forecast

Load Forecast 1. Energy forecast 2. Demand forecast	Nova Scotia Power forecasts
Customer Accounts Forecast	Nova Scotia Power forecasts
Customer Demographics	Nova Scotia customer surveys and other primary and secondary sources
Measure-level inputs 3. Fuel Shares 4. Equipment Shares 5. Saturations/Densities 6. Energy/Demand Savings 7. Codes & Standards	• Nova Scotia end use surveys • Nova Scotia program evaluation reports • Statistics Canada and NRCan data • Past potential studies
Global Inputs 8. Inflation rates 9. Discount rates 10. Avoided energy and capacity costs 11. Retail rates 12. Line loss factors 13. Non-energy impacts	• Inflation rate forward target of 2% - Bank of Canada • 2019 Approved WACC/AFUDC rate for Discount Rate • "Base-DSM" Avoided Costs from 2014 IRP, with 2018 estimate of T&D avoided costs from NS Power • 2019 Retail Electricity Rates with 2.7% escalation – As in 2014 IRP • Line loss factors from 2017 evaluation of DSM programs • No Non-Energy Impacts to be included
Incentive Level Assumptions (Achievable Potential Inputs)	ENS recent past program experience and future plans

In the first step of the market assessment, Navigant will develop a set of energy sales forecasts for electric consumption and electric peak demand, disaggregated by sector (e.g., residential and BNI), and end use. The reference forecasts will span the 25-year study period, from 2021 to 2045. The reference case will act as the point of comparison (i.e., the reference) for the calculation of the technical, economic, and achievable savings potential over the study period. The reference case forecast effectively represents the *expected* level of electricity consumption and electricity demand over the study period absent any incremental DSM activities conducted.

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To develop accurate and localized forecasts, potential studies typically differentiate energy use forecasts by structural sector (e.g., residential and BNI). Navigant will further disaggregate the energy use forecasts using customer segments and end uses.

Navigant will disaggregate the reference case energy forecasts using the customer segments and end uses listed in Figure 3. DSM potential will be disaggregated by sector, end use, and building-type, and if possible, by region. Sector, end use, building type, and region are described in the following table.

Figure 3. Potential Study Customer Segments

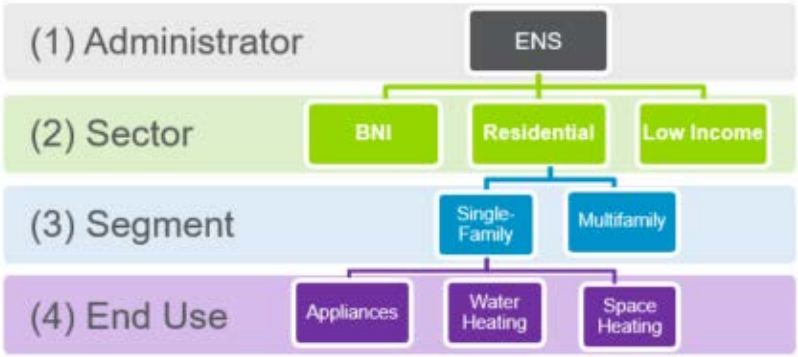
Category	Sub-Categories
Sector	a) Residential (with low-income treated as a subcomponent) b) Business, Non-Profit and Institutional (all non-Residential customers)
End Use	c) Cooking and Laundry d) Electronics and Information Technology (IT) e) Domestic Hot Water (DHW) f) Heating, Ventilation and Air-conditioning (HVAC) g) Lighting h) Refrigeration i) Process j) Energy Management k) Other
Building Type	l) SF Market Rate m) MF Market Rate n) SF Low Income o) MF Low Income p) First Nations q) Small Commercial r) Large Commercial s) Institutional **t)** Industrial
Region	u) Based on first three characters of postal codes

The first key output of the market characterization will be the development of the base year analysis. The base year will be calibrated against provincial (Nova Scotia Power) sales data for the most recent historical year for which sales data is available (2018 or 2017). The objective of the base year will be to establish a detailed profile of Nova Scotia electricity consumption for across all customer sectors and segments, and end uses.

We will develop the base year analysis based on a bottom-up assessment of electricity consumption. This bottom-up approach is illustrated by Figure 4. We will begin at the most granular level by analyzing end use equipment types (e.g., space heating, lighting, etc.) and the corresponding efficiencies (e.g., SEER, Efficacy, etc.), building those up to the end use level, and further up to the customer segment-level, the sector-level, and finally the administrator-level.

As illustrated by Figure 4, the energy sales forecast will be based on multiple levels (or dimensions); from the administrator level down to the equipment efficiency level. Navigant can report electricity consumption at any of the four levels of aggregations, and we will work with E1 to ensure the aggregated electricity consumption (at each level) is reasonable and well aligned with expectations.

Figure 4. Illustrative Breakdown of Energy Sales Forecast



Based on Navigant's experience conducting energy efficiency potential studies, we consider two of these levels of aggregation as the most critical:

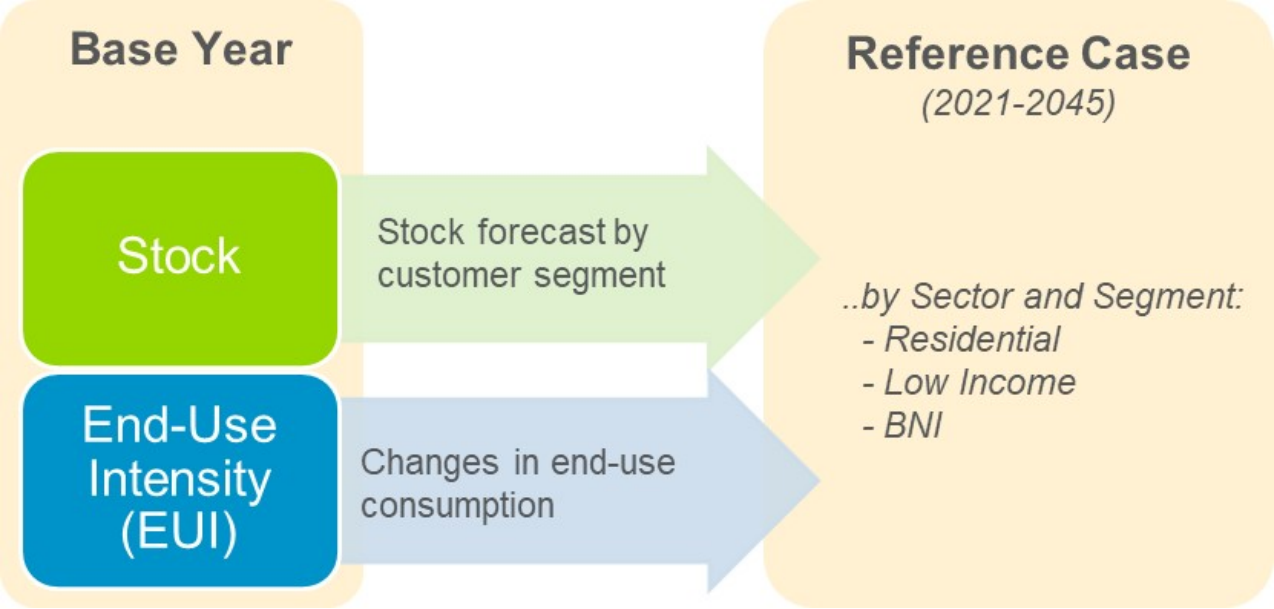
- Customer segments
- End Uses

The customer segment and end use levels are critical for all potential studies because these can introduce a high degree of complexity to the overall study and process. A potential study with many customer segments and end uses can add a significant amount of unwanted complexity if the granularity of the results does not align with project goals and programs to be implemented. However, if the customer segments and end uses are selected appropriately and are consistent with internal processes and target programs, detailed results can deliver significant value for program managers and DSM planners. Based on our experience, it is also critical that customer segments and end uses be well aligned with the availability and level of detail of the data resources available. For example, to characterize electricity consumption across a variety of BNI segments, fuel shares (e.g., electrically heated vs. gas heated buildings) and equipment shares (e.g., penetration of heat pumps, baseboard heating, etc.) should, in theory, be captured by an end use study. As part of this effort, Navigant will collaborate with E1 on the segmentation.

The next step in the base year calibration analysis involves the establishment of specific end uses for each customer sector. In general, Navigant's approach for determining appropriate end uses is based on the differences in specific activities or customer need that requires electricity, without specifying the equipment used to satisfy that need (e.g., space cooling and water heating versus central A/C and tankless water heaters).

The next step in the study is developing the reference case forecast. The significance of the reference case in the context of the potential study is that it will act as the point of comparison (i.e., the reference) for the calculation of the technical, economic, and achievable savings potential over the study period. The reference case forecast effectively represents the *expected* level of electricity demand over the period absent any incremental DSM activities offered by ENS moving forward. The reference case will use the base year analysis as the foundation for developing the forecast. This is illustrated by Figure 5.

Figure 5. Schematic of Reference Case Development



2.1.1.1 Stock Assumptions

Navigant will first develop stock growth rates based on the study's segmentation established for each customer sector. Navigant understands that as part of its load forecasting process, a utility develops a forecast of the number of residential and non-residential buildings (facilities). These forecasts will provide the foundation for estimating net building growth within the reference case forecast. Navigant will also develop forecasts of BNI floor area. Combined, these stock growth forecasts will be a direct input into the reference case forecast.

2.1.1.2 EUI Trends

The second step of building the reference case forecast will be to establish appropriate EUI

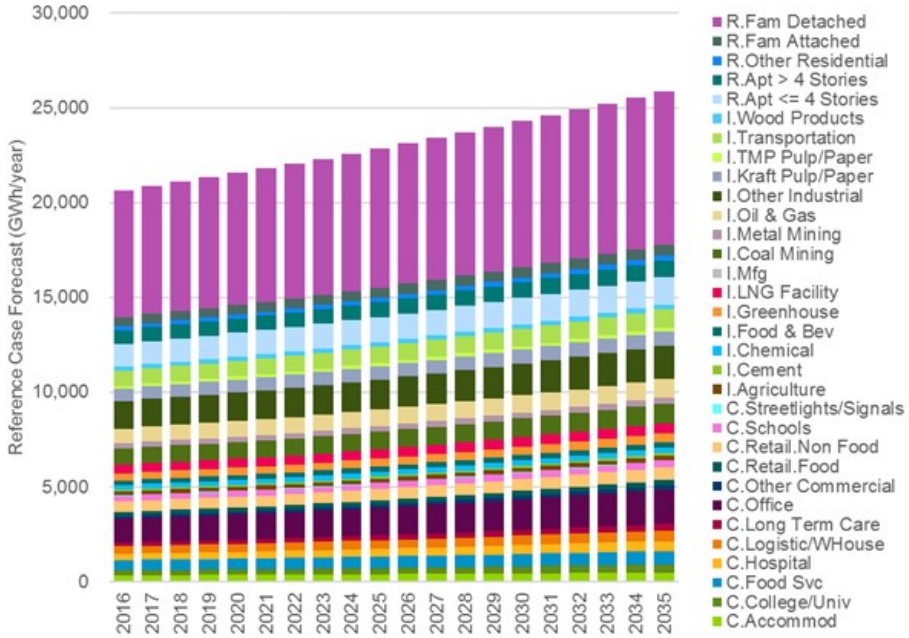
trends to be applied to each customer segment. EUI trends are intended to reflect natural changes in electricity consumption as a result of two factors: (1) natural conservation and (2) natural growth.

- Natural conservation is a well-established concept in DSM programs, and typically refers to actions taken by electricity customers—in absence of sponsored programs—to improve energy efficiency and reduce consumption.
- Natural growth refers to actions taken by electricity customers to increase consumption without the involvement of guided programs. An example of natural growth is home electronics, where customers may be increasing their electric consumption (e.g., through addition of more televisions, computers, etc.) and causing an increase in the electronics end use intensity.

For example, EUI trends in the residential sector will capture trends occurring in space heating, space cooling, water heating, appliances, lighting, etc. A critical component of the reference case forecast will be netting out "natural conservation" from building codes and appliance/equipment standards. Navigant will work with E1 and stakeholders to define the appropriate definition of natural conservation, including the impact of future codes and standards that are planned or announced. The impact of these future codes and standards can be (1) "netted out" from and not counted in the conservation potential, or (2) included in the conservation potential as a separate and unique source of savings. DSMSim™ can readily address either approach and we are flexible as to which approach should be incorporated into the reference forecast and conservation potential estimates.

The final step of the reference case forecast will be to apply the EUI trends and the stock growth rates to the base year results. The resulting forecast will be a detailed projection of electricity consumption by sector and segment. Figure 6 illustrates what the reference case forecast will look like. This figure shows a forecast of annual electricity consumption by each individual customer segment by year.

Figure 6. Illustrative Example of Reference Case Forecast of Electricity Consumption



Source: Navigant

In addition to developing the reference case forecast, Navigant will support E1 in the development of global assumptions for the potential study. These assumptions include:

- Inflation rate
- Discount rate
- Avoided energy and capacity costs
- Consumer price forecast
- Retail rates
- Line loss factors

2.1.2 Step 3: Define, Characterize and Screen Efficiency Measures

The next step in the potential estimation process is to define and characterize energy efficiency measures (EEMs). We use the terms “measures” and “technologies” to refer to any actions taken to increase efficiency or reduce demand, whether through changes in equipment, control strategies, or behaviour.

2.1.2.1 Define Efficiency Measures

Navigant's process for defining potential EEMs includes developing a comprehensive list of efficiency technologies and actions to be included under three main categories: (1) residential energy efficiency, (2) BNI energy efficiency, and (3) peak load reduction. To develop the list of measures, Navigant will draw upon existing measures used in the current ENS DSM programs and the ENS TRM, which was recently done for the 2018 ENS Potential Update and 2020-2022 DSM Plan analyses. We will also introduce "new" measures not previously offered by ENS and consider emerging measures that are expected to become commercially available in the near term. In addition, we will review recent program design and evaluation studies conducted by ENS to ensure all appropriate technologies are assessed, including any specific technologies requested by the ENS.

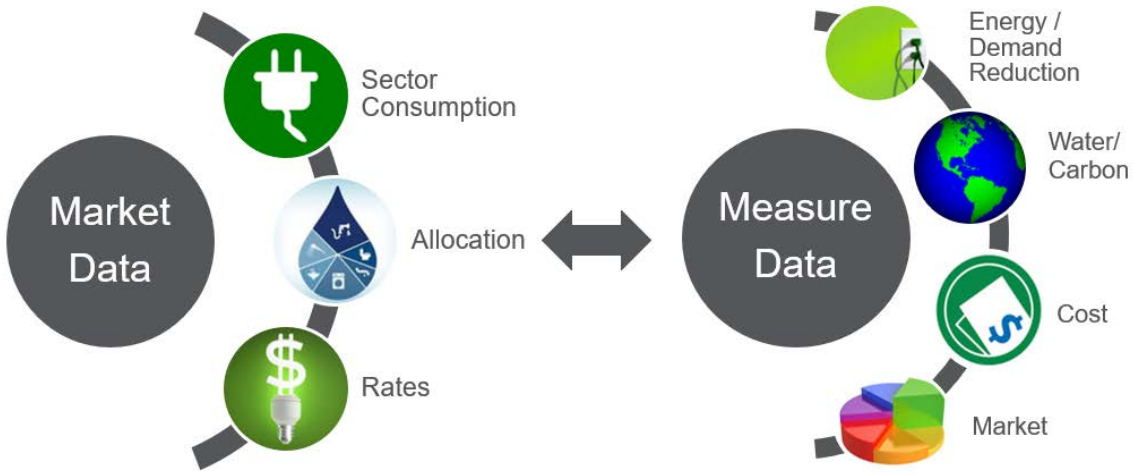
Navigant has fully characterized complete measure datasets during previous potential studies and the most recent ENS DSM Plan, and we can leverage this prior analysis to expedite the measure characterization step of this analysis, which is often the most time-consuming task in a potential study. Upon completion of the in-depth measures review and identification process, Navigant will develop a final list of "recommended" measures that will be presented to E1 and stakeholders for review and discussion, and highlight any which were not included in the 2018 ENS Potential Study Update or the 2020-2022 ENS DSM Plan.

2.1.2.2 Characterize Efficiency Measures

After Navigant and E1 have reached agreement on a final measures list, Navigant will proceed with measure characterization, as needed to supplement existing characterizations for measures in the territory. At a high level, measure characterization involves (1) identifying energy, demand, and other savings (e.g., operations and maintenance) of each measure, including changes over time; and (2) identifying costs associated with each measure, including changes over time (such as prices coming down because of greater volume sold and technology improvements). As appropriate, winter and on/off peak ratios will be determined to accurately calculate avoided cost benefits for each measure. Avoided costs from water and other fuel impacts (for any fuel-switching measures) will be included in the measure characterizations and cost-effectiveness testing.

Navigant's process for characterizing measures is illustrated in Figure 7. The figure illustrates the important links between general market characteristics and measure-level characteristics. Data regarding market characteristics (consumption, end use allocations, retail rates, etc.) are combined with measure-specific data characteristics (energy/demand reduction, water, costs, market maturity, etc.).

Figure 7. Link Between Market and Measure Characterization



Navigant largely will leverage measure characterization analyses that have been completed for prior studies to the maximum extent possible. When necessary, we will make limited updates to measure characterizations. As necessary, Navigant will vet and fully characterize each measure included in the potential study in terms of the measure's energy savings, costs, and applicability. Each characterized measure will have an estimate of typical savings and costs on a defined unit (e.g., per measure, per customer, per building, per square footage, or per 1000 square meters for the BNI sector), with explicit references to supporting documentation. Figure 8 depicts some ways Navigant will characterize each resource by estimating the following measure parameters.

Figure 8. Characterization Measure Parameters

Measure Replacement Methodology	Measure Description	Savings Estimations	Measure Costs	Measure Densities and Saturation
Each measure defined as retrofit/early retirement/dual baseline, replace on burnout (ROB), or new, to guide baseline definitions and incremental cost calculations	Technical definitions of the baseline (code or existing) and energy efficiency technology with characteristics such as efficiency. Definitions of baseline technologies will account for any anticipated changes to codes and standards.	Baseline, code, and efficient technology annual energy consumption used to calculate savings. The effect of future changes to codes and standards considered to develop a savings profile over the analysis period. We will use a single climate zone.	Incremental measure costs will be calculated based on the measure applicability and account for all material, labor, and operations and maintenance costs associated with the baseline, code, and/or efficient technology.	Densities will be defined as the number of each technology per unit (per home for residential and per sq. ft. for BNI sectors). Saturations are defined as the % penetration of the efficient technology.

2.1.3 Step 4: Develop Energy Efficiency Potential Estimates

Once the reference case forecasts and measure characterizations are complete, Navigant will develop estimates of the potential savings available for a 25-year period, from 2021-2045.

There are three general types of energy efficiency and renewable energy resource potential: (1) technical, (2) economic, and (3) achievable.

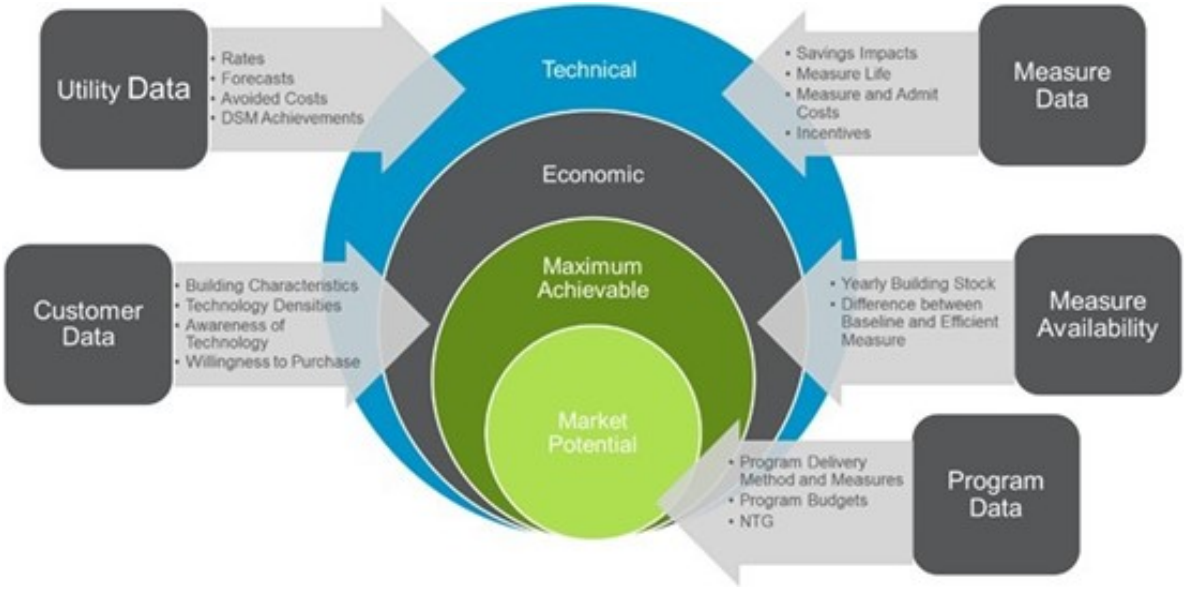
a) **Technical potential** represents what can be saved from available or emerging efficiency and renewable technologies and practices without regard to either the costs or the benefits of the measures.

b) **Economic potential** represents the fraction of the technical potential that is cost-effective under a set of technology costs and full avoided costs developed for the period of analysis.

c) **Achievable potential** represents the fraction of the economic potential that: (1) can be plausibly realized in the marketplace, given market constraints (e.g., equipment turnover rates) and the impacts of programs and policies that could be implemented; and (2) is cost-effective from the standpoint of direct utility bill savings only.

Navigant will develop potential estimates starting with technical potential, followed by economic, and then finally achievable potential. Figure 9 illustrates the key inputs and the layers of the potential modelling approach.

Figure 9. Approach to Market Potential Analysis



The analysis for technical and economic potential is modeled on the measure level only. This analysis allows for measures that can be installed, regardless of end user affinity to the measure or the cost of the measure (technical potential), to make it through the screening process. Then the next level provides a screening of the technology on the margin, only associated to the incentive/measure cost for the economic potential. Finally, the analysis can consider the program delivery which considers that overall measure/incentive cost (differs for

direct install and rebate programs, for example) and the program delivery or administrative cost (upstream versus downstream). The achievable potential analysis will be addressed and reported at the sector level (residential and BNI) by end use and building type.

The analysis will address the following aspects:

- Baseline market conditions (informed by the results of the Baseline Study currently being conducted by Navigant on behalf of EfficiencyOne)
- The full array of commercially-available technologies, including measures that aren't currently readily commercially-available but could be expected to be during the study period. At minimum, this will include EfficiencyOne's full current portfolio of measures. Measures will be developed in conjunction with E1 and stakeholder feedback will be further considered. Draft final measure assumptions will be communicated to stakeholders for review on 05/24/2019, as part of the scenarios/sensitivities and detailed assumptions package. Due to budget and timeline constraints, a maximum of five scenarios will be considered.
- Anticipated customer behaviour modelling, given specific incentive levels and the most relevant determinants of customer response, such as return or years to payback.
- The current and forecast detailed state of the Nova Scotia electricity system and its customers, such as:
    - Net system requirement
    - Firm peak demand
    - Expected timing of system peak demand
    - Number and type of customers
    - Sector-level energy and demand requirements
    - Net energy and system-peak demand savings, at the generator, of energy efficiency measures (after free-ridership, spillover, and interactive effects)
    - Demand reduction measures

2.1.3.1 Develop Technical Potential

Technical potential is defined as the energy savings that can be achieved assuming that all installed measures can immediately be replaced with the efficient measure/technology, wherever technically feasible, regardless of the cost, market acceptance, or whether a measure has failed and must be replaced.

As noted above, Navigant's modelling approach considers an energy-efficient measure to be any change made to a building, piece of equipment, process, or behaviour that could save energy. The savings can be defined in numerous ways, depending on which method is most appropriate for a given measure. Measures such as condensing water heaters are best characterised as some fixed amount of savings per water heater; savings for measures such as BNI automated building controls are typically characterised as a percentage of customer

segment consumption or per square foot; and, lastly, measures such as industrial ventilation heat recovery are well-suited for estimating energy savings as a percentage of end use consumption. The DSMSim™ model can appropriately handle savings characterizations for all three methods.

The calculation of technical potential in this study will differ depending on the assumed measure replacement type, since technical potential is calculated on a per-measure basis and includes estimates of savings per unit, measure density (e.g., quantity of measures per home), and total Nova Scotia building stock.

The potential study will estimate the incremental annual and cumulative technical potential of

energy and peak demand savings capable through EE, without consideration of any non-engineering constraints, and include all possible efficient measures, disregarding economic feasibility and market acceptance. Technical potential will also consider how any anticipated future codes and standards will affect the baseline. Savings resulting from codes and standards ("natural adoption") will be quantified separately from technical potential.

The model accounts for three replacement types, where technical potential from retrofit and replace-on-burnout measures are calculated differently from technical potential for new measures. The formulae used to calculate technical potential by replacement type are demonstrated below.

New Construction (NEW) Measures

Similar to replace-on-burnout measures, the cost of implementing new measures is incremental to the cost of a baseline (and less efficient) measure. However, new construction technical potential is driven by equipment installations in new building stock rather than by equipment in existing building stock.[5] New building stock is added to keep up with forecasted growth in total building stock and to replace existing stock that is demolished each year. Demolished (sometimes called replacement) stock is calculated as a percentage of existing stock in each year and can be specified to Nova Scotia market conditions. New building stock (the sum of growth in building stock and replacement of demolished stock) determines the incremental annual addition to technical potential, which is then added to totals from previous years to calculate the total potential in any given year. In cases where data is not available, Navigant will use similar data that we have already gathered from comparable studies.

The equations used to calculate technical potential for new construction measures are provided below.

Annual Incremental Technical Potential (AITP): $AITP_{YEAR}$ = New $Buildings_{YEAR}$ (e.g., buildings/year[6]) X Measure Density (e.g., widgets/building) X $Savings_{YEAR}$ (e.g., sq.mt./widget)

[5] In some cases, customer segment-level and end use-level consumption/sales are used as proxies for building stock. These consumption/sales figures are treated like building stock in that they are subject to demolition rates and stock-tracking dynamics.

[6] Units for new building stock and measure densities may vary by measure and customer segment (e.g., 1,000 square meters of building space, number of residential homes, customer-segment consumption/sales, etc.).

X Technical Suitability (dimensionless)

Total Technical Potential (TTP): $TTP_Y = TTP_Y = \sum_{YEAR=2029}^{YEAR=2020} AITP_{YEAR}$

Retrofit (RET) and Replace-On-Burnout (ROB) Measures

RET measures, commonly referred to as advancement or early-retirement measures, are replacements of existing equipment before the equipment fails. RET measures can also be efficient processes that are not currently in place and that are not required for operational purposes. RET measures incur the full cost of implementation rather than incremental costs to some other baseline technology or process because the customer could choose not to replace the measure and would, therefore, incur no costs. In contrast, replace-on-burnout measures, sometimes referred to as lost-opportunity measures, are replacements of existing equipment that have failed and must be replaced, or existing processes that must be renewed. Because the failure of the existing measure requires a capital investment by the customer, the cost of implementing ROB measures is always incremental to the cost of a baseline (and less efficient) measure.

RET and ROB measures have a different meaning for technical potential compared with NEW measures. In any given year, the entire building stock is used for the calculation of technical potential.[7] This method does not limit the calculated technical potential to any pre-assumed rate of adoption of retrofit measures. Existing building stock is reduced each year by the quantity of demolished building stock in that year and does not include new building stock that is added throughout the simulation. In cases where data is not available, Navigant will use similar data that we have already gathered from comparable studies.

For RET and ROB measures, annual potential is equal to total potential, thus offering an instantaneous view of technical potential. The equation used to calculate technical potential for retrofit measures is provided below.

***Annual/Total Savings Potential** = Existing Building Stock $_{YEAR}$ (e.g., buildings[8]) X Measure Density (e.g., widgets/building) X Savings $_{YEAR}$ (e.g., sq.ft.[3]/widget) X Technical Suitability (dimensionless)*

Competition Groups

Navigant's modelling approach recognizes that some efficient technologies will compete against each other in the calculation of potential. The study defines competition as efficient measures competing for the same installation as opposed to competing for the same savings (e.g., window A/C vs. split-system A/C) or for the same budget (e.g., lighting vs. water heating). For instance, a consumer may install a condensing water heater or a tankless water heater; both of which belong to the same competition group, as only one of these would be installed. General characteristics of competing technologies used to define the competition groups proposed for

[7] In some cases, customer segment-level and end use-level consumption/sales are used as proxies for building stock. These consumption/sales figures are treated like building stock in that they are subject to demolition rates and stock-tracking dynamics.

[8] Units for building stock and measure densities may vary by measure and customer segment (e.g., 1,000 square meters of building space, number of residential homes, customer-segment consumption/sales, etc.).

this study include:

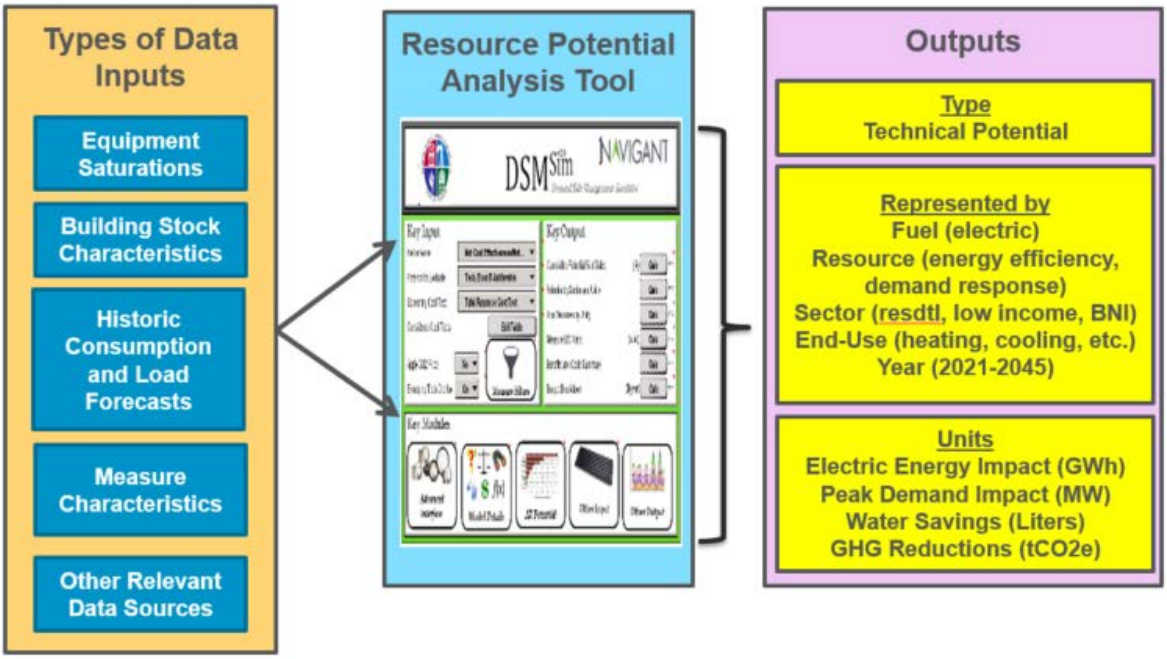
- Competing efficient technologies share the same baseline technology characteristics, including baseline technology densities, costs, and consumption
- The total (baseline plus efficient) maximum densities of competing efficient technologies are the same
- Installation of competing technologies is mutually exclusive (i.e., installing one precludes installation of the others for that application)
- Competing technologies share the same replacement type (RET, ROB, or NEW)

To address the overlapping nature of measures within a competition group, Navigant's analysis only selects one measure per competition group to include in the summation of technical potential across measures (i.e., at the end use, customer segment, sector, service territory, or total level). The measure with the largest savings potential in a given competition group is used for calculating total technical potential of the competition group. This approach ensures that double-counting is not present in the reported technical potential, though the technical potential for each individual measure is still calculated and reported.

Develop and Run the EE Technical Potential Model

The overall EE technical potential modelling framework is illustrated in Figure 10. The chart identifies the some of the key data inputs, the resource potential module, and the specific output types provided from the various modules. Figure 10 also summarizes the various dimensions of outputs produced from the potential model: type of potential (technical) reported at various levels (sector, end use, etc.) and in certain units (GWh, MW, etc.).

Figure 10. Navigant's Technical Potential Model Data Flow



2.1.3.2 Develop Economic Potential

Economic potential is a subset of technical potential and uses the same assumptions regarding immediate replacement as in technical potential, however, only includes those measures that have passed the cost-benefit (B/C) tests chosen for measure screening. For Nova Scotia, a measure with a total resource cost test (TRC) B/C ratio greater than or equal to 1.0 is a measure that provides monetary benefits greater than or equal to its costs. If a measure's B/C meets or exceeds the threshold, it is included in the economic potential. DSMSim™ can calculate the five standard cost tests for the cost-benefit analysis: Participant Cost Test, Program Administrator Cost Test, Ratepayer Impact Measure Test, Total Resource Cost Test, and Societal Cost Test. and use any of the tests for economic screening.

When the TRC test is used for measure screening, administrative costs are not included in the economic screening process at the *measure level* because, typically, the measure's cost-effectiveness *on the margin* is the objective of the test. Rather, administrative costs are typically included in economic potential calculations when aggregating multiple measures into an archetype program or portfolio. However, our team, and the DSMSim™ model, are flexible on this front. Specifically, DSMSim™ has the capability of including administrative costs in screening at the measure level, if desired.

Similar to technical potential, only one economic measure (meaning that its B/C ratio meets the threshold) from each competition group is included in the summation of economic potential across measures (e.g., at the end use, customer segment, sector, service territory or total level). If a competition group is composed of more than one measure that passes the TRC test, then

the economic measure that provides the greatest savings potential is included in the summation of economic potential. This approach ensures that double-counting is not present in the reported economic potential, though economic potential for each individual measure is still calculated and reported.

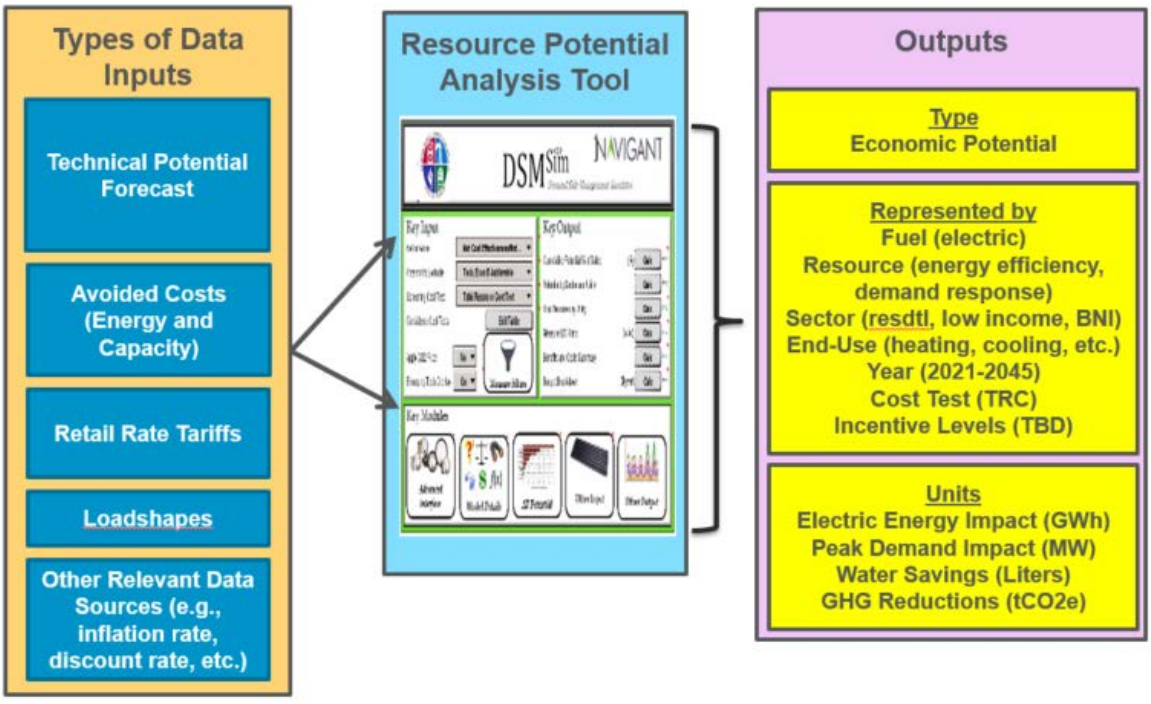
DSMSim™ has the flexibility to provide potential outputs by "binned" levelized cost groups as desired by E1. If required and based upon the cost of conserved energy for the various measures included in the economic potential, Navigant will work with E1 to identify the most appropriate bins for this grouping and the most appropriate application (e.g., for economic potential, achievable potential or both).

Develop and Run the Economic Potential Model

We will deploy our DSMSim™ model which provides estimates of economic potential for a defined service area. We will screen specific DSM measures using a TRC threshold level of 1.0. The overall economic potential modelling framework is illustrated in Figure 11.

We will primarily draw on the results of the technical potential to feed the economic potential analysis. Using our model, we will run cost-benefit screens for all measures considered in the technical potential analysis. To that end, we will draw upon the avoided costs for electricity. We will then develop the economic potential outputs in the manner outlined on the right-hand bar of Figure 11.

Figure 11. Navigant's Economic Potential Model Data Flow





2.1.3.3 Develop Achievable Potential

This section presents the approach to calculating achievable potential, which is fundamentally more complex than the calculation of technical or economic potential. The potential study will estimate the annual and cumulative achievable potential of energy and peak demand savings through EE by analyzing up to five scenarios with varying levels of incentives. Scenarios will be developed in conjunction with E1 and stakeholder feedback will be considered. Draft final scenarios will be communicated to stakeholders on 05/24/2019, as part of the scenarios/sensitivities and detailed assumptions package. Due to budget and timeline constraints, a maximum of five scenarios will be considered, one of which will be maximum achievable. To conduct the analysis at a sector level, Navigant will determine the achievable potential at the building type and end use level.

The critical first step in the process of accurately estimating achievable potential is to simulate market adoption of energy-efficient measures. Our approach to simulating the adoption of energy-efficient technologies for purposes of calculating achievable potential can be broken down into the following two strata:

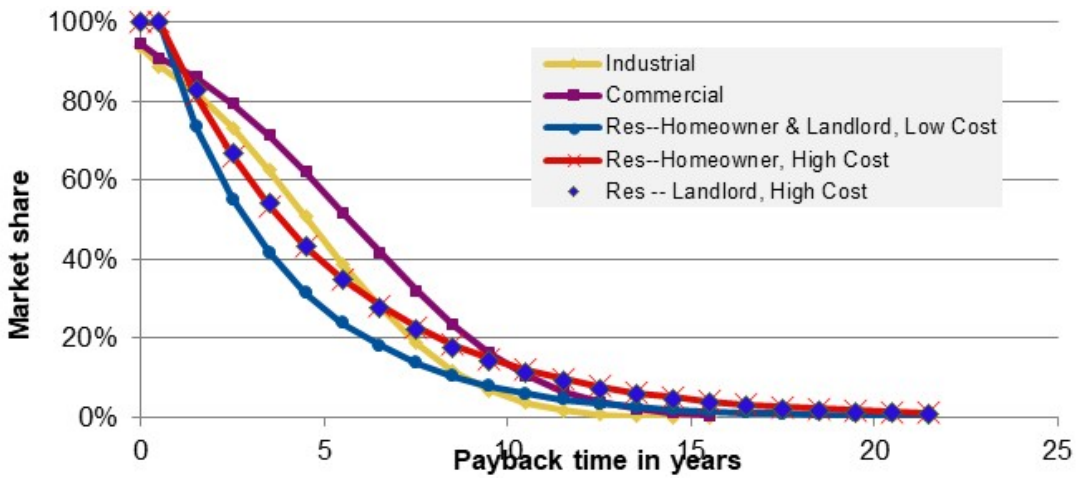
- Calculation of the *equilibrium market share*
- Calculation of the *dynamic approach to equilibrium* market share

Calculation of Dynamic Equilibrium Market Share

The equilibrium market share can be thought of as the percentage of individuals choosing to purchase a technology provided those individuals are fully aware of the technology and its relative merits (e.g., the energy- and cost-saving features of the technology). For energy-efficient technologies, a key differentiating factor between the base technology and the efficient technology is the energy and cost savings associated with the efficient technology. Of course, that additional efficiency often comes at a premium in initial cost. In efficiency potential studies, equilibrium market share is thus often calculated as a function of the payback time of the efficient technology relative to the inefficient technology. While such approaches certainly have limitations, they are nonetheless directionally reasonable and simple enough to permit estimation of market share for the dozens or even hundreds of technologies that are often considered in potential studies.

Navigant will develop equilibrium payback acceptance curves based on the results of the baseline study being conducted, which will query Nova Scotians about their awareness of and willingness to install efficiency measures. Based on the survey respondents, Navigant will develop payback acceptance curves, as illustrated in Figure 12. These surveys presented decision makers with numerous choices between technologies with low upfront costs but high annual energy costs, and measures with higher upfront costs but lower annual energy costs.

Figure 12. Example – Payback Acceptance Curves



Source: Navigant, 2015

Since the payback time of a technology can change over time; as technology costs and/or energy costs change over time, the equilibrium market share can also change over time. The equilibrium market share is, therefore, recalculated for every time-step within the market simulation to ensure the dynamics of technology adoption considers this effect. As such, the term "equilibrium market share" is a bit of an oversimplification and a misnomer, as it can itself change over time and is, therefore, never truly in equilibrium; it is used nonetheless to facilitate understanding of the approach.

Calculation of the Approach to Equilibrium Market Share

Two approaches are used for calculating the approach to equilibrium market share (i.e., how quickly a technology reaches final market saturation): one for new technologies or those being modeled as a retrofit (a.k.a. discretionary) measures, and one for technologies simulated as ROB (a.k.a. lost-opportunity) measures[9]. A high-level overview of each approach is provided in the following sections.

Retrofit and new technologies adoption approach uses an enhanced version of the classic Bass diffusion model[10,11] to simulate the S-shaped approach to equilibrium that is commonly observed for technology adoption. Figure 13 provides a stock/flow diagram illustrating the

[9] Each of these approaches can be better understood by visiting Navigant's technology diffusion simulator, available at: http://forio.com/simulate/navigantsimulations/technology-diffusion-simulation.

[10] Bass, Frank (1969). "A new product growth model for consumer durables". Management Science 15 (5): p215–227.

[11] See Sterman, John D. Business Dynamics: Systems Thinking and Modeling for a Complex World. Irwin McGraw-Hill. 2000. p. 332.

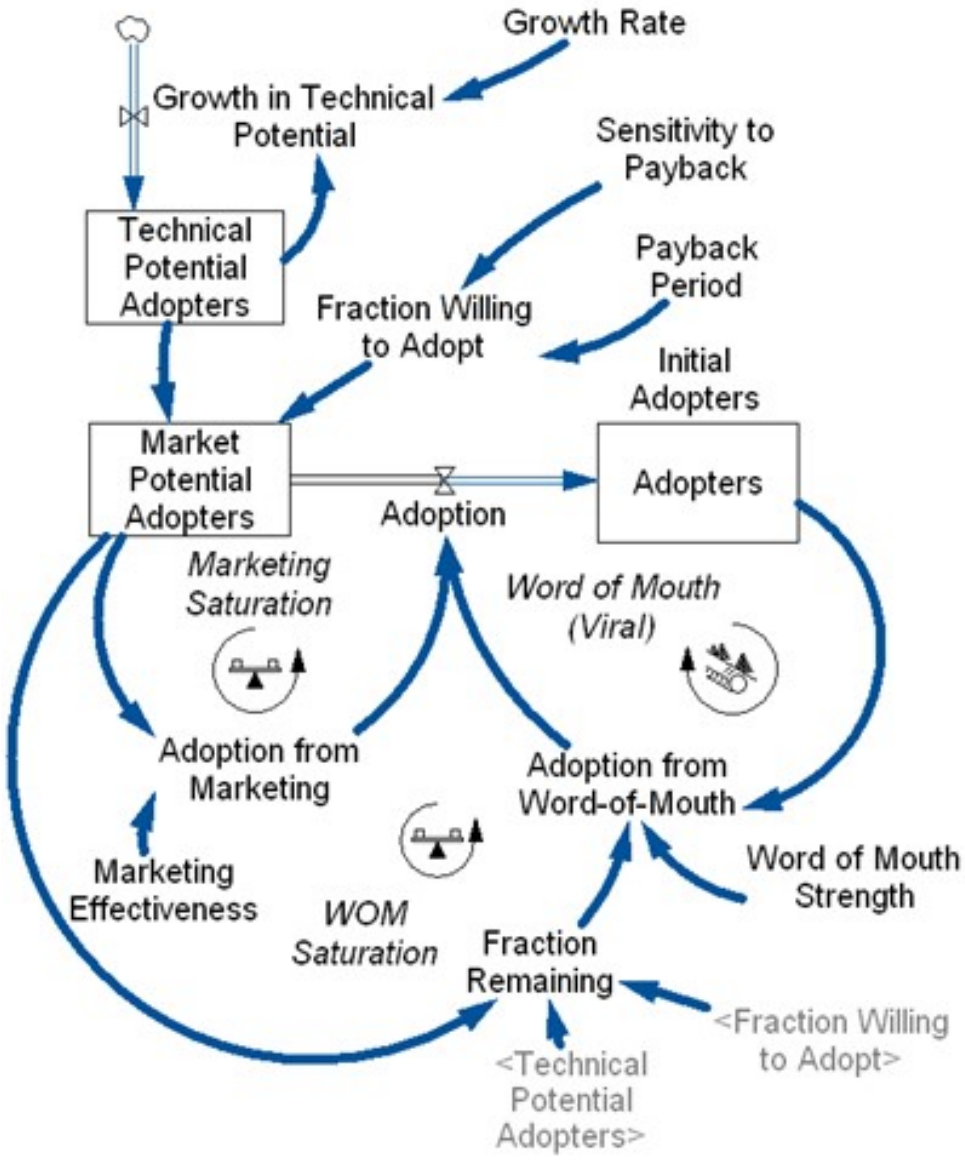


causal influences underlying the Bass model. In this model, market potential adopters flow to adopters by two primary mechanisms: adoption from external influences, such as program marketing/advertising, and adoption from internal influences, including word-of-mouth. The fraction of the population willing to adopt is estimated using the payback acceptance curves illustrated in Figure 13.

The marketing effectiveness and external influence parameters for this diffusion model are typically estimated upon the results of case studies where these parameters were estimated for dozens of technologies.[12] Recognition of the positive, or self-reinforcing, feedback generated by the word-of-mouth mechanism is evidenced by increasing discussion of the concepts such as social marketing as well as the term viral, which has been popularized and strengthened most recently by social networking sites such as Facebook and YouTube. However, the underlying positive feedback associated with this mechanism has been ever present and a part of the Bass diffusion model of product adoption since its inception in 1969.

[12] See Mahajan, V., Muller, E., and Wind, Y. (2000). New Product Diffusion Models. Springer. Chapter 12 for estimation of the Bass diffusion parameters for dozens of technologies. This model uses the median value of 0.365 for the word-of-mouth strength in the base case scenario. The Marketing Effectiveness parameter was assumed to be 0.04, representing a somewhat aggressive value that exceeds the most likely value of 0.021 (75th percentile value is 0.055) per Mahajan 2000.

Figure 13. Stock/Flow Diagram of Diffusion Model for New Products and Retrofits

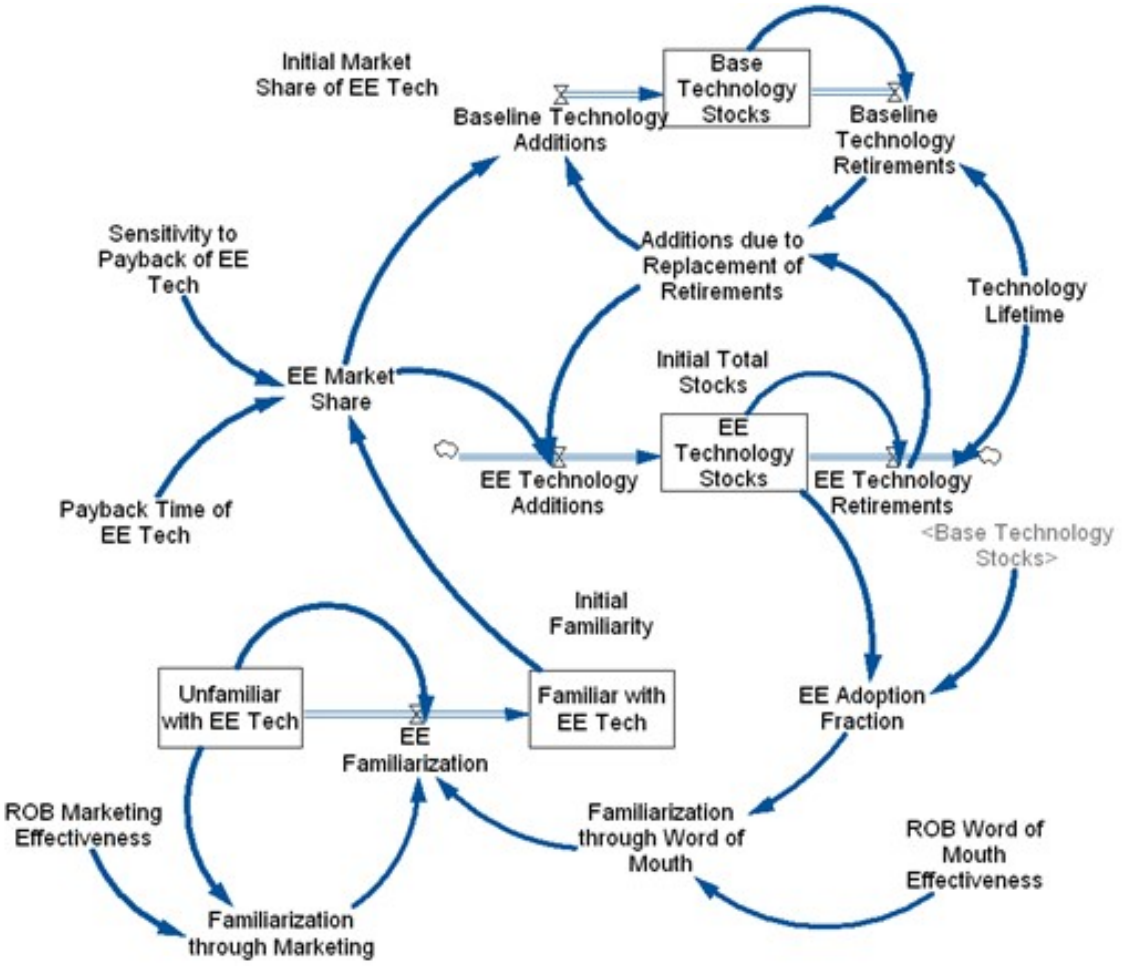


Source: Navigant, 2015

The dynamics of adoption for ROB technologies technology adoption approach is somewhat more complicated than for new/retrofit technologies since it requires simulating the turnover of long-lived technology stocks. In order to account for this, the DSMSim™ model tracks the stock of all technologies, both base and efficient, and explicitly calculates technology retirements and additions consistent with the lifetime of the technologies. Such an approach ensures that technology churn is considered in the estimation of market potential, since only a fraction of the total stock of technologies are replaced each year, which affects how quickly technologies can

be replaced. A model that endogenously generates growth in the familiarity of a technology, analogous to the Bass approach described above, is overlaid on the stock-tracking model to capture the dynamics associated with the diffusion of technology familiarity. A simplified version of the model employed in DSMSim™ is illustrated graphically in Figure 14.

Figure 14. Stock/Flow Diagram of Diffusion Model for Replace-on-Burnout Measures



Source: Navigant, 2015

Model Calibration

Calibration of a predictive model imposes unique challenges, as future data is not available to compare against model predictions. While engineering models, for example, can often be calibrated to a high degree of accuracy since simulated performance can be compared directly with performance of actual hardware, predictive models do not have this luxury. Demand-side management models, therefore, must rely on other techniques to provide both the developer and the recipient of model results with a level of comfort that simulated results are reasonable.

For this project, Navigant proposes to take a number of steps to ensure that the initial, base year used (2018 or 2017) forecast model results are reasonable and consider historic adoption, including:

1. Comparing forecast values, by sector and end use, against historic achieved savings (e.g., from program savings for 2018 or 2017). Although some studies indicate that demand-side management potential models are calibrated to ensure first-year simulated savings precisely equal prior-year reported savings, we have found that forcing such precise agreement has the potential to introduce errors into the modelling process by effectively masking the explanation for differences—particularly when the measures included may vary significantly. Additionally, there may be sound reasons for first-year simulated savings to differ from prior-year reported savings (e.g., savings estimates have changed). Thus, while Navigant endeavors to achieve agreement to a degree believed to be reasonable between past results and forecast first-year results, our approach does not force the model to do so—providing, the team believes, a degree of confidence that the model is internally consistent.
2. Identifying and ensuring an explanation existed for significant discrepancies between forecast savings and prior-year savings, recognizing that some ramp-up is expected, especially for new measures or archetype programs.
3. Calculating $/first-year kWh costs by sector and comparing these with past results.
4. Calculating the split (percentage) in spending between incentives and variable administrative costs predicted by the model to historic values.
5. Calculating total spending by sector and end use and comparing the resulting values to historical spending.
6. Calculating portfolio-level $/first-year kWh costs and comparing these with values Navigant researched through benchmarking of other jurisdictions.

Achievable Potential Scenarios and Incentive Levels

A key component of any potential study is determining the appropriate level at which to set measure incentives for a scenario. Navigant's DSMSim™ model offers several different strategies for setting incentive levels, each of which are accessible via DSMSim™ 's graphical user interface, as illustrated in Figure 15.

Figure 15. Model Incentive Options



Navigant will work with E1 to determine the incentive method desired for this study, as each has its advantages and disadvantages. Based on E1's guidance, as a starting point, we will employ one of the following incentive strategies for the achievable potential scenario. Scenarios will be developed in conjunction with E1 and stakeholder feedback will be considered. Draft final scenarios will be communicated to stakeholders on 05/24/2019, as part of the scenarios/sensitivities and detailed assumptions package. Due to budget and timeline constraints, a maximum of five scenarios will be considered, one of which will be maximum achievable. These strategies can be characterized as follows:

- ***Levelized Cost Threshold Approach:*** In this approach, incentive levels are set to achieve a specified threshold spending level (on a $/levelized kWh saving basis). This threshold incentive level would be adjusted iteratively to a point where overall spending results in the achieving the savings targets.
- ***Targeted Payback Approach:*** This approach instead sets incentive levels at a level that targets a specified payback period for each measure (e.g., 1.5 or 2 years). This approach will tend to result in a higher savings acquisition costs (resulting in lower savings for a given budget) than a levelized cost threshold approach. However, it does tend to result in what some may consider to be a more comprehensive portfolio (i.e., one that more proportionally allocates spending and savings across various end uses). The reason is that the lower cost measures (such as lighting), which already tend to have short payback times, receive lower incentives relative to incremental cost than in the levelized cost threshold approach, thereby permitting greater spending on non-lighting measures (e.g., HVAC and shell measures). For this reason, this approach is at times preferred by stakeholders.
- ***Percent of Incremental Cost Approach:*** This approach simply calculates the incremental cost of each measure and then provides an incentive that is a specified percentage of that incremental cost. This method, while common in the industry, tends to result in a somewhat less comprehensive portfolio than the targeted payback approach, while also providing lower total savings for a given budget than the levelized cost threshold approach. Thus, it does not tend to be Navigant's proposed option. However, since the results tend to be fairly similar to the targeted payback approach, and since the approach is simple and easy to communicate, it is sometime preferred by stakeholders.

The achievable potential analysis results will reflect the portfolio of passing measures under the desired cost-benefit test. For the passing measures, we will determine the reasonably achievable winter peak demand (kW) and annual energy savings (kWh), and corresponding for 25 years, 2021 through 2045. Each achievable potential set of results will consider the market availability of each measure, customer awareness, the anticipated adoption rate at the specified incentive level, and any relevant market barriers.

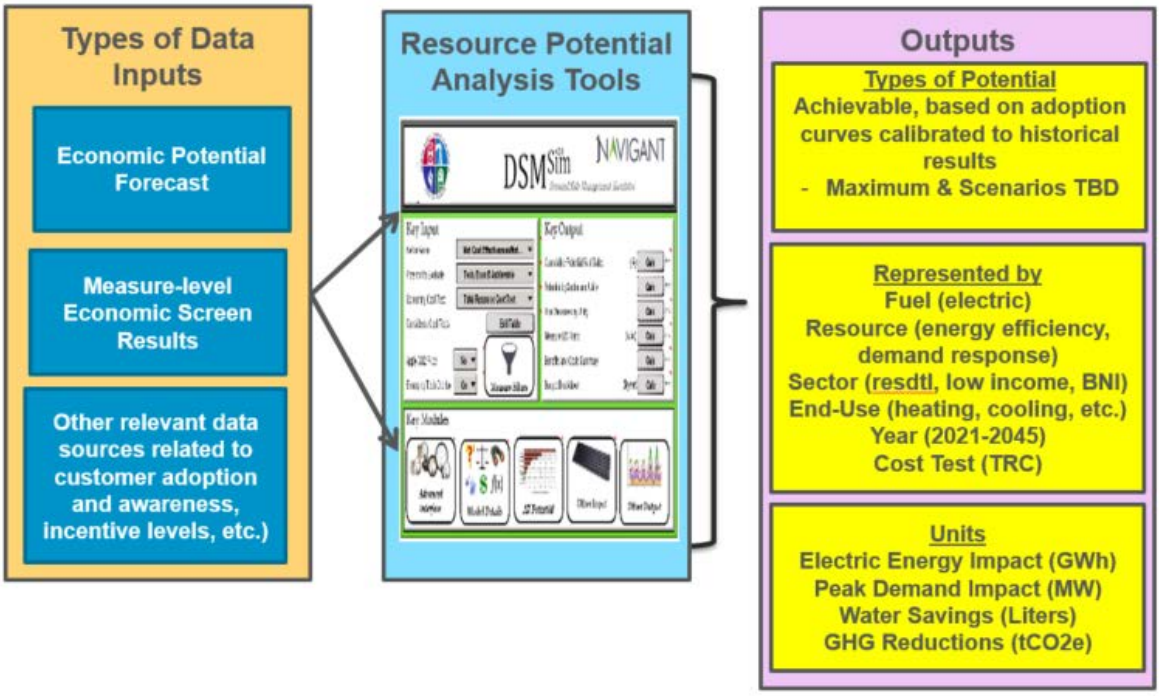
Develop and Run the Achievable Potential Model

The overall achievable potential modelling framework is illustrated in Figure 16. We will draw on the results of the economic potential analysis to feed the achievable potential analysis. Using

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our model, we develop estimates of achievable potential of all measures passing the economic screen. To that end, we draw upon the specified avoided costs. We will then develop the achievable potential outputs in the manner outlined on the right-hand bar of Figure 16.

Figure 16. Navigant's Achievable Potential Model Data Flow



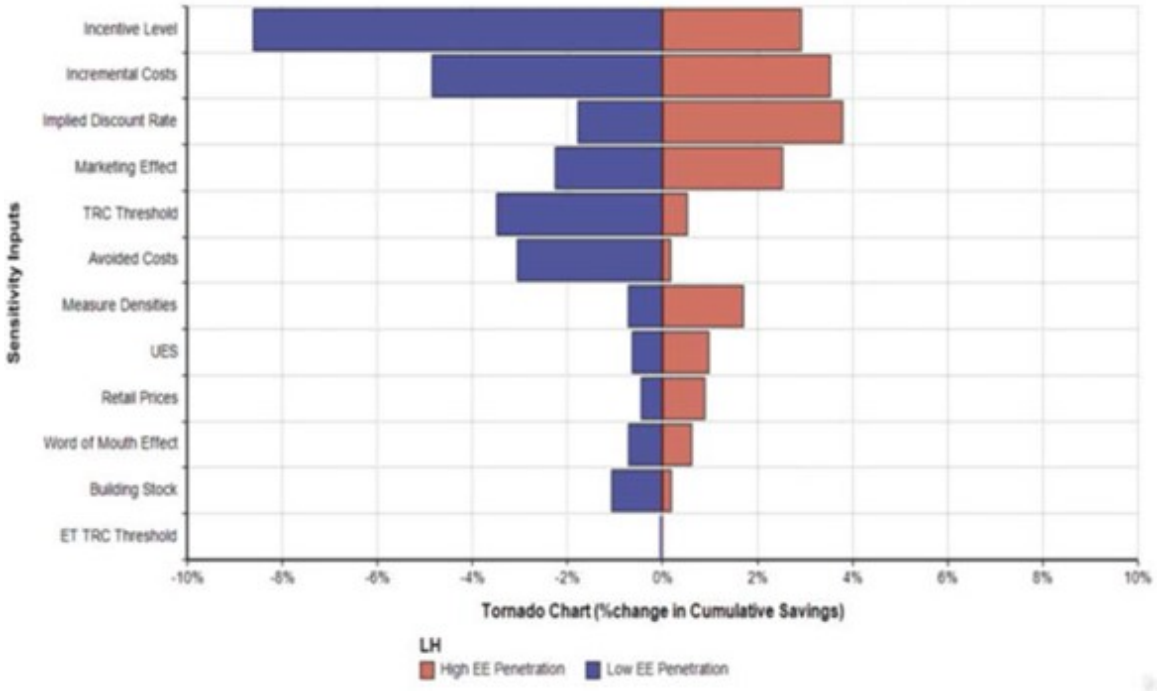
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Sensitivity Analysis

Sensitivity analysis will allow E1 and stakeholders to gauge the level of influence a variety of factors can have on energy savings potential. Such understandings are critical to informing related policy decisions (as well as informing effective program design). Navigant may run sensitivity analysis on a variety of model variables, including discount rates. Draft final sensitivities will be communicated to stakeholders for review on 05/24/2019, as part of the scenarios/sensitivities and detailed assumptions package. Due to budget and timeline constraints, a maximum of five scenarios will be considered.

DSMSim™ has the ability the perform sensitivity analyses against twelve of the most influential factors impacting potential concurrently. Figure 17 demonstrates an example of this capability. Such analyses will be completed to provide E1 with an increased understanding of the relationships between key variables and potential. DSMSim™ can easily and quickly run different levels of sensitivity analyses to compare results with each case of results developed.

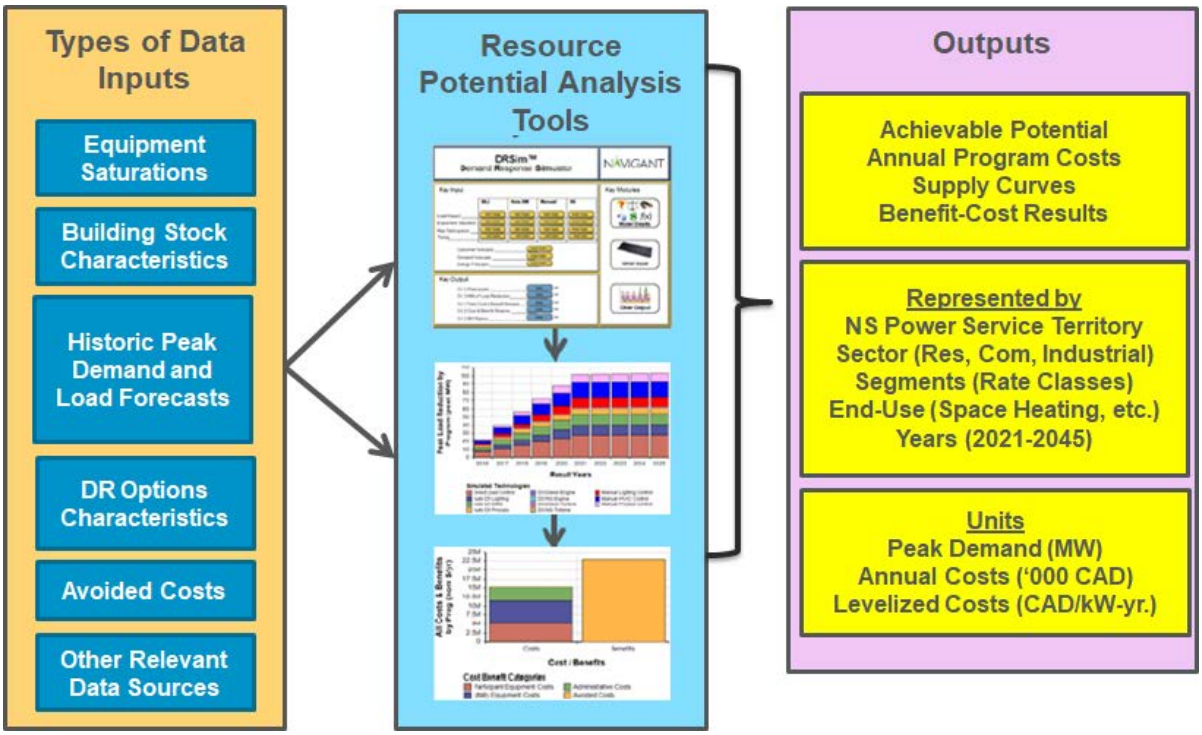
Figure 17. Tornado Chart Showing Model Sensitivities to Changes in Key Variables



2.2 Approach to Demand Response Potential

This section describes Navigant's approach to developing estimates of the DR potential. Over the course of conducting similar studies, Navigant has developed a series of steps that encompass our general approach for conducting the DR potential analysis. The overall data flow of the DR study is as shown in Figure 18.

Figure 18. Demand Response Potential Study Data Flow

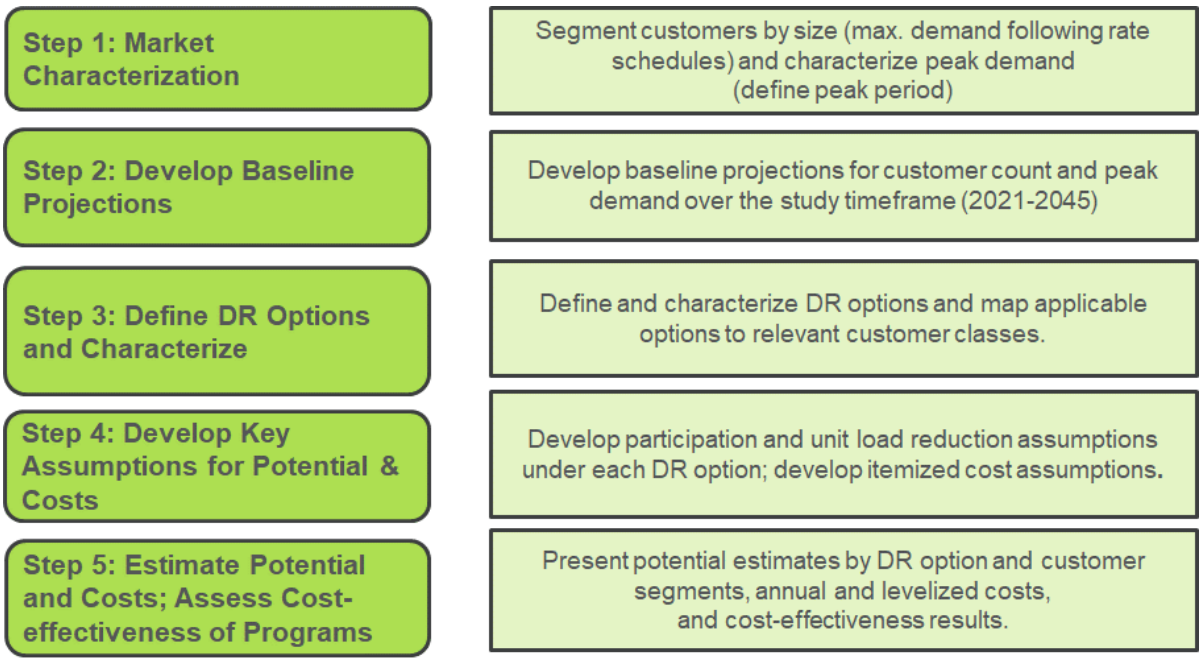


Navigant will develop DR potential and cost estimates using a bottom-up analysis. For the analysis, Navigant will utilize primary data from E1 and from the baseline study being conducted concurrent with this study, and supplement with secondary data where there are gaps. Navigant will customize its DRSim™ model, which uses this data as inputs, for this study. The following subsections detail Navigant's DR potential and cost estimation methodology, as summarized in Figure 19. Developing the potential and cost estimates included the following steps:

- Characterize market for DR potential by quantifying the number of eligible customers and estimating coincident winter peak load by customer class over the 25-year study period (2021 – 2045).
- Define and characterize DR options and map applicable options to relevant customer classes and/or building types.
- Develop participation levels, unit load reductions and cost assumptions for each DR option, by customer class and building type combination.
- Present potential estimates by DR option, customer class and building type; annual and levelized costs; and cost-effectiveness results.
- Conduct scenario analysis and present the range of DR potential, cost and cost-effectiveness results for each of the scenarios.

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Figure 19. DR Potential Assessment Steps



The following sub-sections discuss each step in more detail.

2.2.1 Step 1: Develop Market Characterization

Market characterization is the first step in the DR potential assessment process. Figure 20 presents the different levels of market segmentation for DR potential assessment. The Level 2 segmentation follows Nova Scotia Power's rate schedules. The segmentation approach presented in Figure 20 is based on recent discussions between E1 and Navigant and represent mutually agreed upon segmentation approach. This segmentation approach is different from that followed in the energy efficiency potential assessment, where customers are not differentiated by rate class.

Figure 20. Market Segmentation Approach for DR Potential Assessment

Level	Description
Level 1 **By Sector**	1. Residential 2. Business, Non-profit and Institutional (BNI)
Level 2 **By Segment** **(following rate schedules)**[13]	3. Residential o Single and Multi-Family o Low Income 4. Commercial o Small General Demand o General Demand o Large General 5. Industrial o Small Industrial o Medium Industrial o Large Industrial
Level 3 **By End Use** **(for each segment)**	6. Residential: space heating, electric water heating, electric vehicles, batteries 7. BNI: HVAC, electric water heating, lighting, industrial processes, electric vehicles, batteries

Level 1: Sector

Navigant will segment customers between the residential and business, non-profit and institutional (BNI) sectors.

Level 2: Customer Segment

Single-family and multi-family dwelling customers are grouped into one category for the DR analysis since the applicable DR option does not vary by dwelling type. Low income customers are separated out as a different segment. First Nation customers are included in the single-family category based on recent discussions between E1 and Navigant. BNI customers are segmented by Nova Scotia Power's rate schedules, as represented in Figure 21. Small General and General Demand customers map to the Small Commercial segment in the EE analysis. Large General segment under Commercial maps to the Large Commercial in EE, and the three industrial rate classes are all grouped under industrial segment in the EE analysis.

Level 3: End Use

Navigant will develop a breakdown of the winter peak demand by end use for each segment as indicated in Figure 21.

[13] Customers under the Municipal rate will be blended across the residential and BNI customers and will not be considered separately. This is consistent with how these customers are treated in the EE analysis.

2.2.2 Step 2: Develop Baseline Projections

Once the market segments are defined, the next step is to select the base year, which is the latest year for which full customer count and load data is available, 2018 or 2017. The selection of the base year will be consistent with that used in the EE potential.

The baseline projection for DR potential assessment entails the following:

Customer count projections by segment for Nova Scotia (Levels 1 and 2 in Figure 20).

- **Winter peak demand projections** by segment for Nova Scotia (Levels 1, 2, and 3 in Figure 20).

Navigant will use a bottom-up approach for developing the winter peak demand projections by customer segment and end use and calibrate this to the winter peak demand projections available from Nova Scotia Power. Navigant's approach for disaggregating peak demand till the end use level enables a granular assessment of peak demand reduction potential by end use.

The disaggregated winter peak demand projections by revenue class, building type and end use will utilize the following data sources:

- **Retail sales data by revenue class** (which is in turn mapped to customer segments).
- **Baseline sales projections by segment and end use** (described in Steps 1 and 2 for the EE potential).
- **End Use load shapes**. Navigant will use available load research data by rate class, available from Nova Scotia Power, and end use shapes developed by Navigant in a prior 2013 DSM Potential study for Nova Scotia, and fill in gaps, if any, with publicly available information sources.[14]

Navigant will compare the bottom-up disaggregated winter peak demand projections with system peak demand projections from Nova Scotia Power and calibrate the bottom-up derived estimates to match the utility's demand projections.

2.2.3 Step 3: Define Demand Response Options and Characterize

Figure 21 presents Navigant's proposed list of DR options by market segment. This list is based on a universal set of DR options that is typically considered in a DR potential study and standard industry practice. Navigant has had initial discussions with E1 on the proposed list and received their approval. The list will be finalized based on feedback from stakeholders and further discussions with E1.

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[14] For example, Open EI provides a publicly available database of end use load profiles for DOE reference building types. This dataset contains hourly load profile data for 16 BNI building types (based off the DOE BNI reference building models) and residential buildings (based off the Building America House Simulation Protocols). This dataset also uses the Residential Energy Consumption Survey (RECS) for statistical references of building types by location. Hourly load profiles are available for all TMY3 locations in the United States.

http://en.openei.org/doe-opendata/dataset/commercial-and-residential-hourly-load-profiles-for-all-tmy3-locations-in-the-united-states

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Figure 21. Proposed List of DR Options by Customer Segment[15]

Direct Load Control (DLC) • Thermostat • Load Control Switch	Control of electric loads by a thermostat and/or load control switch.	Residential, Small General Demand	space heating, electric water heating.
C&I Curtailment • Manual • Auto-DR enabled	Firm capacity reduction commitment. $/kW payment based on contracted capacity, plus $/kWh payment based on energy reduction during an event.	General Demand, Large General, Industrial	Various load types including- heating, ventilation, lighting, water heating, refrigeration, industrial process loads.
Electric Vehicle Charging Control • Auto-DR enabled	Managed charging of electric vehicles for peak demand reduction.	All	Electric vehicles.
Behind the Meter (BTM) Battery Storage	Use of BTM batteries for load shifting and/or curtailment during peak demand periods.	All	BTM batteries.

[15] This is provided as an example of how Navigant proposes to position DR options by the different segments. It will be finalized based on feedback and discussions with E1.

Dynamic Pricing*	Offer time varying rates (e.g., critical peak pricing), or discounts on electricity use reduction during critical peak periods (Peak Time Rebate). Consider an opt-in type of offer.	All	All

2.2.4 Step 4: Develop Programmatic Assumptions

The purpose of this task is to develop a set of assumptions that will ultimately drive the activity of modelling DR potential. We refer to this process as developing the DR program design parameters.

The two key parameters that are needed for potential estimation are participation rates and unit impact assumptions[16] by DR option for applicable customer segments. Additional parameters for potential estimation include DR event participation rates, percentage of customers with enabling technology, and attrition rates of enrolled customers. In addition, we develop detailed bottom-up program cost assumptions that include items such as program development costs, equipment costs, marketing and program administration costs, product lifetimes, discount rate, etc.

Several important information sources are evaluated during the process of formulating the representative DR portfolio, including:

- First, the effort relies extensively assessing the market characteristics for each of the market segments that we are interested in pursuing. For each market segment, end use market and technology, we typically conduct a detailed review of the amount of baseline load with by customer segment and end use with an eye toward how much of that load might be affected by DR programs.
- Second, we expect to draw upon the experience and insights gleaned from previous DR potential studies conducted by Navigant.
- Third, the knowledge and experience from industry DR best practices plays a significant role in the program development process. We review information presented in well-established secondary sources, such as the FERC National DR Program Survey database[17], and publicly filed program evaluation reports and market assessment studies from other jurisdictions to assess participation, and impact assumptions in similar DR programs offered by utilities and ISOs/RTOs.

[16] Note that we use best available industry information on unit impacts which are provided at the end use level. This utilizes our peak demand projections by segment and end use and applies the unit impacts by end use across all customer segments to develop highly-granular potential estimates associated with each end use by customer segment.

[17] http://www.ferc.gov/industries/electric/indus-act/demand-response/dem-res-adv-metering.asp

- Fourth, we draw on the internal stakeholders to provide valuable insights and perspectives on the results. In the program development process, we will solicit input to help guide and shape the set of programs to be considered in the DR potential assessment.

Program Costs: we develop program costs for each DR program from two main perspectives:

- First are the costs associated with administering the DR programs. This includes staff/labor, marketing, program development, regulatory-related, and measurement/evaluation. Also considered are the costs for developing the DR program infrastructure, including any costs for Demand Response Management Systems (DRMS) and other associated DR program operational functions. Oftentimes, these administrative costs represent shared costs across different DR programs.
- Second are the costs associated with the incentives that will be offered to the customers. This includes any one-time incentives for DR enablement equipment as well as ongoing incentives (such as monthly payments) in exchange for customers offering their loads.

In some cases, customers may be able to use the same enabling equipment to participate in multiple DR programs. These economies of scale will be factored into the cost analysis. We will work closely with E1 as we develop the program costs to ensure agreement with our assumptions at every stage of the process. Navigant has extensive experience in developing costs, and therefore we will rely on expert judgment among our team members for vetting these assumptions. Along with program costs and annual budgets, we also calculate levelized costs for DR programs. We routinely use levelized costs and potential savings results to develop supply curves, in which savings are stacked up in ascending order of costs.

2.2.5 Step 5: Develop Demand Response Potential Estimates

The “Develop Model” task will be more of a “customize model” effort, as Navigant has already developed a suitable model that can serve as a starting point. DRSim™ simulates the roll-out of DR technologies, costs, and their interactions given user-defined deployment trajectories. The established model structure and user-friendly input/output capabilities will provide the starting point for modeling Nova Scotia’s DR potential.

Figure 22 lists key model inputs and outputs for the DR potential study.

Figure 22. Key Inputs and Outputs for DR Potential

- System load
- Customer count by market segment
- Load profiles by market segment
- Retail sales by rate schedule and by business type (if available)
- Participation forecasts by customer segment in different DR programs
- Per customer load impacts (either specified in terms of kW reduction per participant or in terms of percentage of enrolled load)
- Customer attrition, event participation assumptions
- Cost and benefit items
  - Technology costs, per-unit energy & load reductions, initial & maximum saturation levels
  - Various other cost components including program development costs, annual program administration costs, marketing and recruitment costs, O&M costs, and incentive levels.
  - Avoided energy and demand costs.
- Number of participants in DR programs by market segment
- Winter demand reductions and energy savings by DR program and by market segment for Nova Scotia.
- Annual program costs and levelized costs by program (by winter for Nova Scotia).
- Supply curve for DR options (by winter for Nova Scotia).

From our experience, technical and economic potentials for DR are somewhat perfunctory exercises that don't generally shed much light on what we are ultimately after, which is how much DR potential can be achieved. Accordingly, the DR analysis will develop two types of achievable potential estimates – maximum and realistic.

Maximum achievable potential represents an upper-boundary of achievable potential where maximum incentives are offered to customers and marketing and outreach efforts are taken to the highest level to ensure high levels of participation.

Realistic achievable potential represents likely customer adoption when taking into account real-world constraints (e.g., limited budgets, regulatory policies, and customer preferences). Estimates are typically tied to recent program experience and reported savings from past

programs and customers are offered incentives that are in line with existing industry practices.

We will use the potential savings and levelized cost data to construct supply curves which stack up savings in ascending order of costs.

3. Modelling Assumptions

Figure 23 lists many of the key input assumptions necessary for modelling the technical and economic potentials for the EE potential study.

Figure 23. Key Inputs for Energy Efficiency Technical and Economic Potential

Input	Options	Notes	Decision
General Setting and Global Input Options			
Technical Potential Type	Unconstrained/Constrained	Constrained potential, which is only applicable to ROB measures, would be limited by the rate at which measures turn over due to burnout.	Constrained
Competition Group Max for Technical	Max for each fuel/Max for Primary Fuel		Max for Primary Fuel
C&I Stock Basis	EUI, Sales, 1 ksqft	Node Calculate Sales From EUI	thousands of square meters
Apply Demolition Rates to Consumption	Yes/No	Affects sales-based stocks	Yes
Freeze New Stock	Yes/No	Holds new stock constant at first forecast year values	No
Measure and CE Options			
Screening Cost Test	TRC/PAC/SCT/RIM/PCT		TRC
Cost Benefit threshold	0-INF		1.0 at Program Level
CE Override by Measure	All Measures		YES
Reparticipation	0-100%	0.85 in 2018 ELRAM Model	Defer to best practices / previous study
Apply ET Risk Factors to CE?	Yes/No	Risk is modeled as a year over year vector derating savings/cost %	No
Allow Emerging Technologies	Yes/No		Yes
Apply ET Risk Factors to Consumption?	Yes/No		No
Net to Gross Methods	Gross screening--Gross aggregate C/E--Gross potential Gross screening--Gross aggregate C/E--Net potential Gross screening--Net aggregate C/E--Gross potential Gross screening--Net aggregate C/E--Net potential Net screening--Net aggregate C/E--Net potential		Net/Net/Net
Apply Dual Baseline	Yes/No	Impacts RET Measures Unit Energy Savings	Yes
Cost Test Method	2001/2007 CA SPM		2001 CA SPM
Allow Deferred Replacement	Yes/No		Yes
Cost Levelization Method	Levelize over measure life/Levelize over planning horizon		Measure Life
Apply Program Fixed Admin	Yes/No	If yes, need to provide fixed costs that do not scale with savings *for each program*	No - Variable Admin
Apply Admin Inflation	Yes/No		Yes
Apply Portfolio Admin	Yes/No	If yes, need to provide fixed costs that do not scale with savings for the portfolio as a whole, not applicable to individual programs.	No
Include Lost Revenue	By Cost Test/Impact Type	Does not override inclusion in cost-effectiveness testing: only for reporting	No
Apply O&M Inflation	Yes/No		Yes

Figure 24 lists many of the key input assumptions necessary for modelling the achievable potential scenarios for the EE potential study.

Figure 24. Key Inputs for Energy Efficiency Achievable Potential

Calibration and Achievable Potential Options			
Minimum Incentive Fraction	0-100%	% incremental costs. Overrides other incentive choices	10%
Selected Incentive Approach	Percent of Incremental Cost Max Utility Incentive Targeted Payback Targeted Participant Cost Percent of RIM NPV		Targeted Payback
Behavior Measure Incentive Fraction	0-100%	% incremental costs. Overrides other incentive choices. Only applicable for some measure characterization approaches, does not apply for planned rollout of behavior measures.	100%
Maximum Incentive Fraction	0-100%		100%
Apply Incentives to C&S measures	Yes/No		No
Initial Saturation Multiplier	0-INF	Calculates EE awareness from saturation	0.05
Logit Alpha	~2	Affects customer price response within a competition group	2
Incentive-Based Market Share sensitivity	0-100%	Applies to non-competition group recycling measures, where payback does not make sense	0.01
Cost Benefit threshold	0-INF		0.7 at Measure Level

NAVIGANT

in collaboration with:

NARRATIVE RESEARCH

Nova Scotia Residential Sector and BNI Sector Baseline Study

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1. PURPOSE AND METHODOLOGY

1.1 Background

EfficiencyOne has indicated that Nova Scotia Power Inc. (NSPI) will be updating its Integrated Resource Plan (IRP) in 2019. Navigant understands that EfficiencyOne requires estimates of demand-side management (DSM) potential energy and winter peak demand savings for a 25-year period (2021 through 2045) to inform the development of this IRP.

Navigant is developing a 25-year DSM potential analysis to inform the IRP process. To inform and support the potential analysis, and to ensure that the assumptions for the current baseline of energy efficiency in Nova Scotia are current, Navigant, in collaboration with Narrative Research, conducted a market assessment of the current baseline of energy-consuming equipment and building stock within Nova Scotia.

1.2 Purpose

The purpose of conducting this study for EfficiencyOne is:

- to develop **Nova Scotia baseline information**, with saturations of various electricity-consuming equipment in Nova Scotia for residential and business, nonprofit and institutional buildings. This information will ensure that the starting point for the DSM potential estimation process is accurate and current.

- To develop Nova Scotia specific payback acceptance curves, based on responses to questions about willingness to purchase and install energy efficiency equipment, with varying incentive levels.

The primary objectives of this study were to:

Develop customer data by sector and end use that is specific to Nova Scotia.

Develop useful data to inform the Nova Scotia energy efficiency potential study.

1.3 Methodology Overview

This study consisted of a multi-phased data collection methodology. Specifically, there were two parallel studies conducted: (1) a general population (residential) online panel survey, and (2) a commercial panel online survey. These studies were intended to gather information from a sampling of residents and businesses/institutions within Nova Scotia. Given that both of these panel surveys do not represent a probability sampling approach, a margin of error cannot be ascribed to the research findings. Online panels are referred to as ‘samples of convenience’ and therefore results cannot be extrapolated to the entire provincial population of residents and businesses with any degree of statistical certainty. That being said, Narrative Research employed data weighting to the residential survey findings to ensure that the data is as statistically reliable as possible. The detailed methodologies for the two parallel surveys follow.

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1.4 Residential Sector Online Survey Methodology

The primary source of data used in determining the residential baseline was a 2019 online general population panel survey conducted by Narrative Research (formerly Corporate Research Associates) on behalf of Navigant, referred to as the Nova Scotia Energy Usage Baseline Study. On-site data also was collected by Sustainable Housing and was used to supplement and calibrate the self-reported data from the online study. To develop estimates for density (the number of equipment units, both efficient and baseline present in the home), and saturation (the percent of efficient equipment units in the home, relative to the total units), survey responses were calibrated to onsite field observations. The calibration process estimates adjustment coefficients based on the relative difference between the survey responses and the field observations for each sector and measure. These coefficients are applied to customer segment and measure level counts of baseline and efficient equipment. Relative precision is used as the statistical determinant of the appropriateness of this adjustment between the three different estimates of density and saturation for each measure: surveyed, onsite, and calibrated. A lower relative precision indicates a better estimate of the parameter of interest, given a sample size.

The online survey instrument was designed in close consultation with Narrative Research, Navigant Consulting, and EfficiencyOne. Data was collected using an online general population panel hosted by Dynata. The target for this study was 1,000 completed surveys (with 1,002 completes being obtained). The online panel consisted of Nova Scotian residents across a variety of housing types including single family attached and detached homes, condominiums, apartments and other multifamily dwellings of two, three or more units, mobile homes and trailers. The online panel consisted of Nova Scotian residents aged 18 and older and quotas were established regionally, as well as by age and gender. As mentioned, as this was completed using a general population panel that does not comprise all Nova Scotian adults, a margin of error cannot be attributed. The results of this survey were statistically weighted to represent the true distribution of key demographic characteristics of the population. Data collection took place from April 16 to April 24, 2019, with an average survey length of thirteen minutes.

1.5 Business, Nonprofit and Institutional Sector Online Survey Methodology

The online survey instrument was designed in close consultation with Narrative Research, Navigant Consulting, and EfficiencyOne. Data was collected using an online panel of businesses and institutions within Nova Scotia, hosted by Dynata. The target for this study was 200 completed surveys (with 200 completes being obtained). The online panel consisted of Nova Scotian businesses and institutions with one or more employees. To ensure that respondents were capable of answering the survey questions, Narrative Research worked with Dynata to identify decision makers/people familiar with their building systems and their power bill to complete the BNI survey. As mentioned, this was completed using an online panel that does not comprise all Nova Scotia businesses/institutions, and therefore a margin of error cannot be attributed. Data collection took place from April 30 to May 9, 2019, with an average survey length of nine minutes.

1.6 Organization of the Report

The remainder of the report includes the following sections:

Section 2 – Summary of Findings – Residential Sector

Section 3 – Summary of Findings – BNI Sector

Section 4 – Online Survey Findings

Appendix B-1 – Residential Sector Online Survey Instrument

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NAVIGANT Nova Scotia Residential Sector and BNI Sector Baseline Study

Appendix B-2 – BNI Sector Online Survey Instrument

Appendix B-3 – Residential Sector Online Survey Results

Appendix B-4 – BNI Sector Online Survey Results

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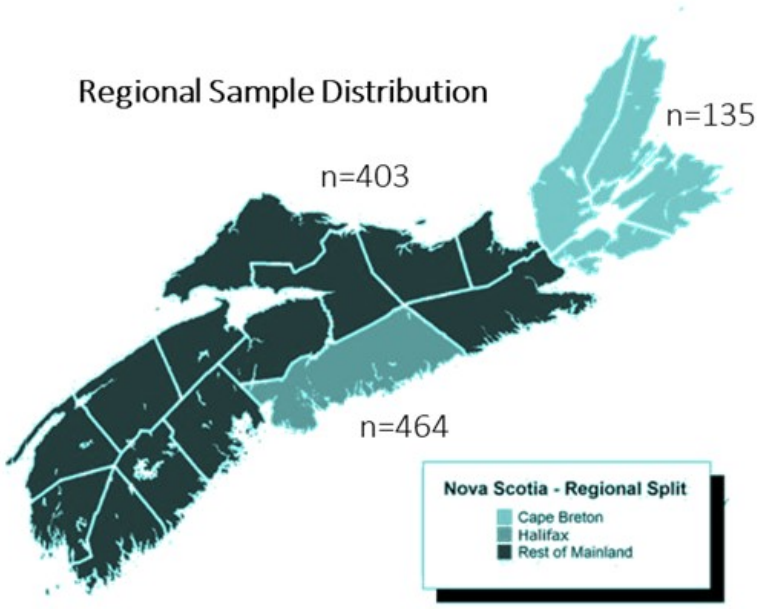
2. SUMMARY OF FINDINGS – RESIDENTIAL SECTOR

This section presents detailed findings from the residential sector online survey and onsite visits to assess baseline conditions in Nova Scotia dwelling units. **It is important to note that when applicable, this section presents the calibrated data as described in section 1.4 above.**

2.1 Residential Survey Responses by Region

Figure 1 shows the distribution of survey responses across the province, with 46.3% from the Halifax region, 40.2% from the rest of the mainland, and 13.5% from Cape Breton Island.

Figure 1. Residential Sector – Survey Responses by Region

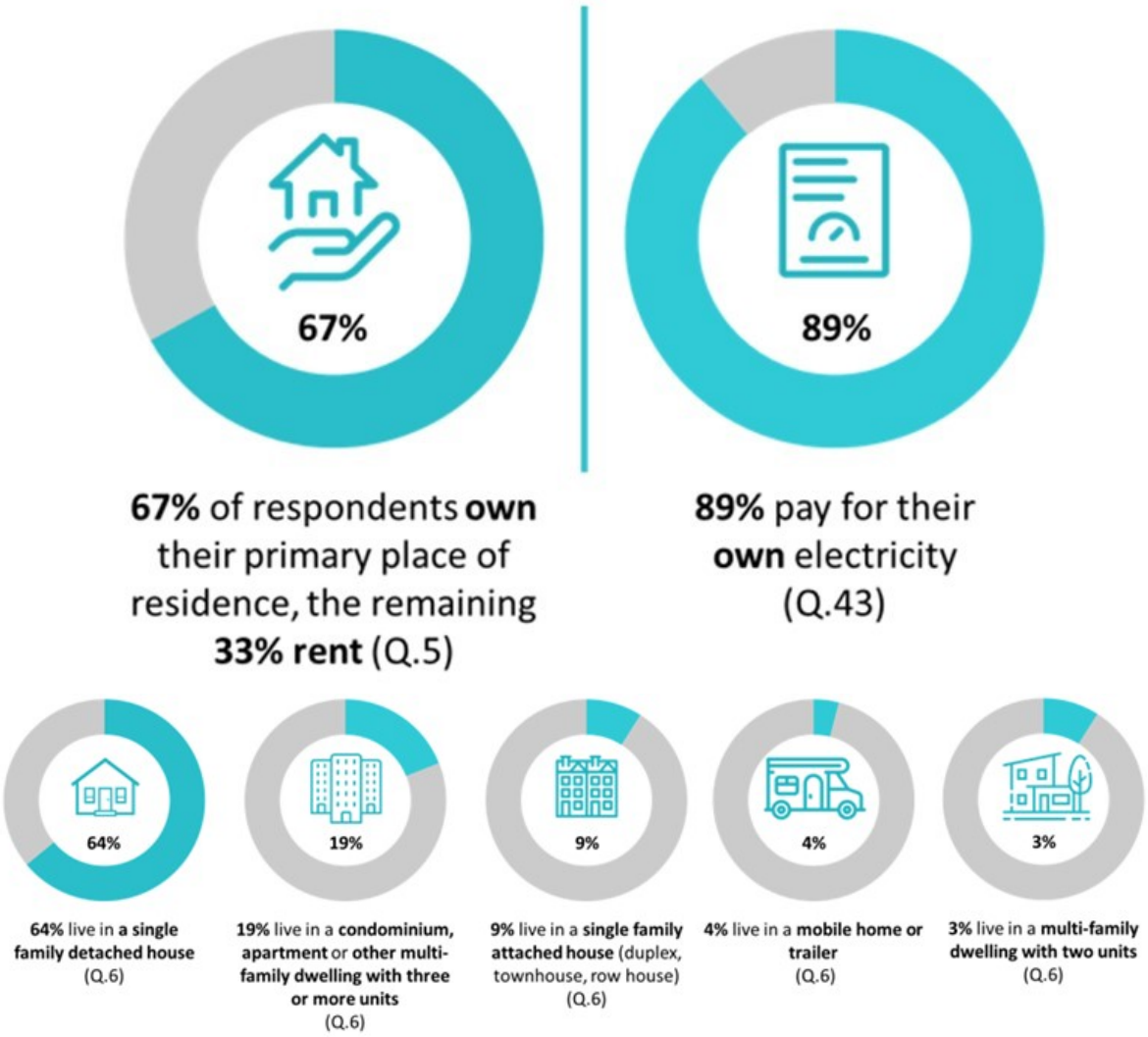


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2.2 Residential – Primary Place of Residence

As shown in Figure 2, the majority of respondents own their home, and most commonly live in a single family detached dwelling. The vast majority of residents pay for their own electricity, as opposed to having a landlord pay, or having some other arrangement. Of note, 2% of respondents live in a First Nations community.

Figure 2. Residential Sector – Primary Place of Residence



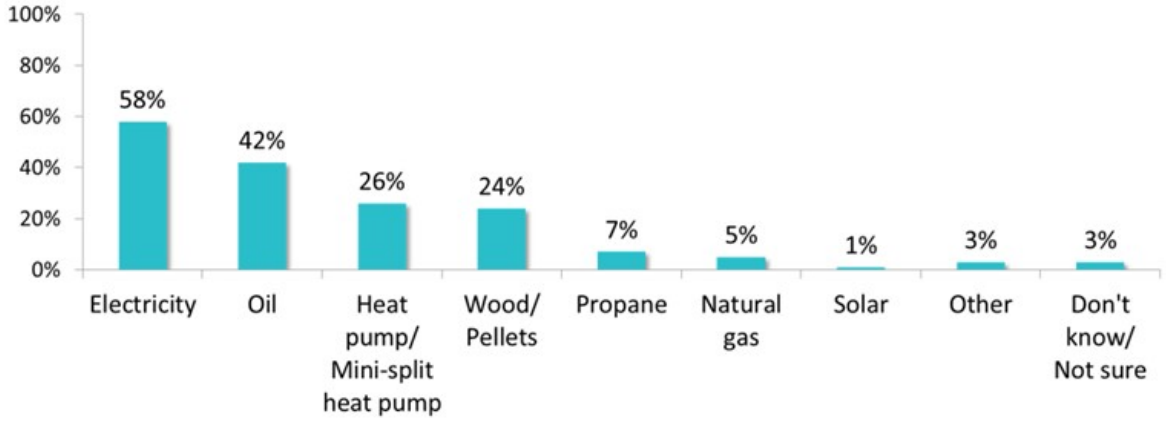
Results do not sum to 100% as some respondents did not provide a response or provided 'other' response.

2.3 Residential – Heating Source Types

Electricity and oil are the most common forms of home heating in the province. Meanwhile, 26% use a heat pump as a main heat source. Survey respondents reported that 33% of all primary heating systems are electric and 62% of households have a secondary heating system installed. Of these, 26% use some form of electric heating as a backup source. Respondents reported 31% of primary heating systems are fuel oil. Figure 3 illustrates all sources (both primary, secondary and tertiary) of energy sources used to heat homes in Nova Scotia.

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Figure 3. Residential Sector – Heating Source Fuel Types – All Sources

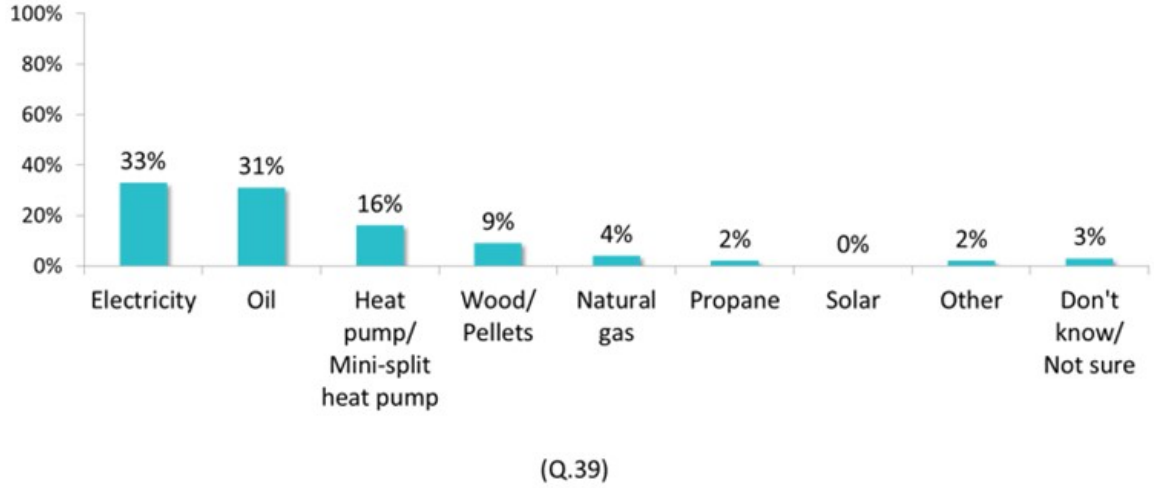


(Q.39+Q.40)

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Figure 4 presents primary heating source types. Nova Scotia residences use electricity for heat (33%), followed by oil (31%), and then heat pump (16%), wood/pellets/chips (9%), natural gas (4%), propane (2%).

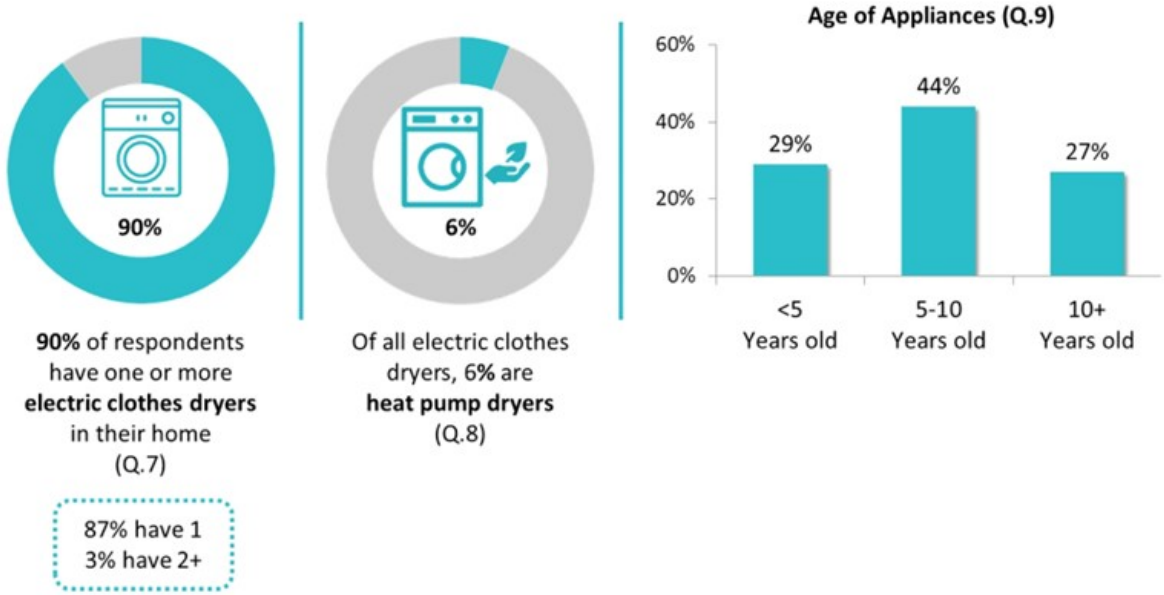
Figure 4. Residential Sector – Primary Heating Source Fuel Type



2.4 Residential – Clothes Dryers

The vast majority of respondents have a clothes dryer in their home. The survey found the 71% of clothes dryers were five years old or older and thus very few homes reported having a heat pump clothes dryer. Figure 5 illustrates the number and age of electric clothes dryers of survey respondents.

Figure 5. Residential Sector – Clothes Dryers

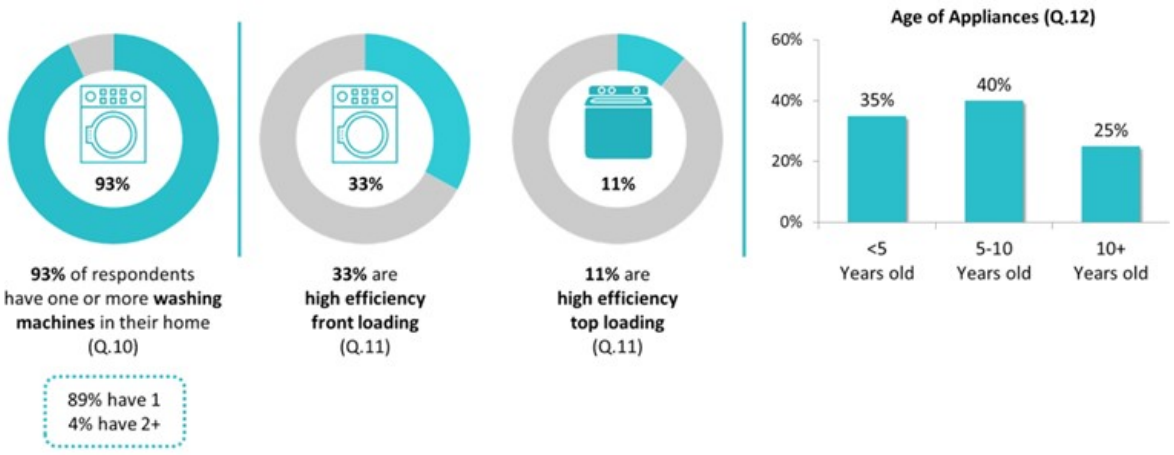


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2.5 Residential – Washing Machines

Figure 6 shows that like dryers, most respondents have a washing machine in their home, and one-third of washing machines are high-efficiency front loading. High efficiency top loading washing machines were found to be present 11% of the time. The survey found the 65% of clothes washers were five years old or older.

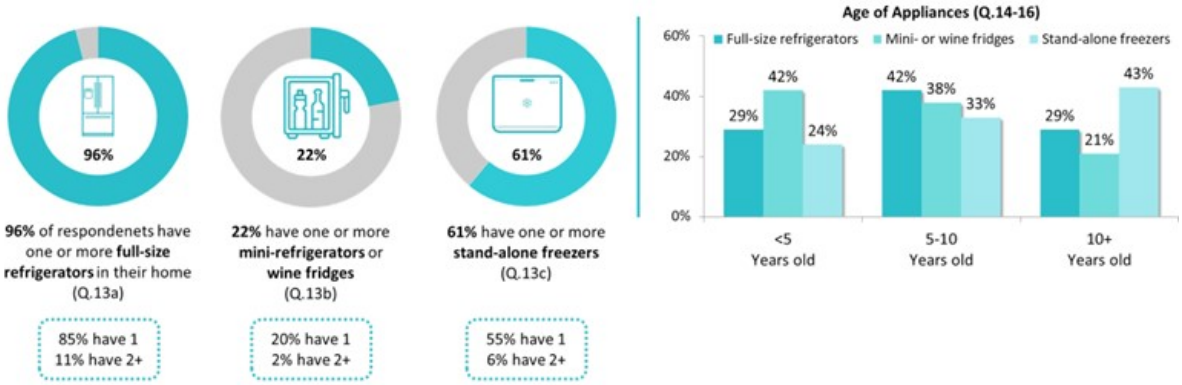
Figure 6. Residential Sector – Washing Machines



2.6 Residential – Refrigerators and Freezers

Virtually all respondents have a fridge in their home with 11% of respondents reporting owning a second full size refrigerator. A majority of respondents also have a stand-alone freezer and reported that stand-alone freezers tend to skew older in age. See Figure 7.

Figure 7. Residential Sector – Refrigerators and Freezers

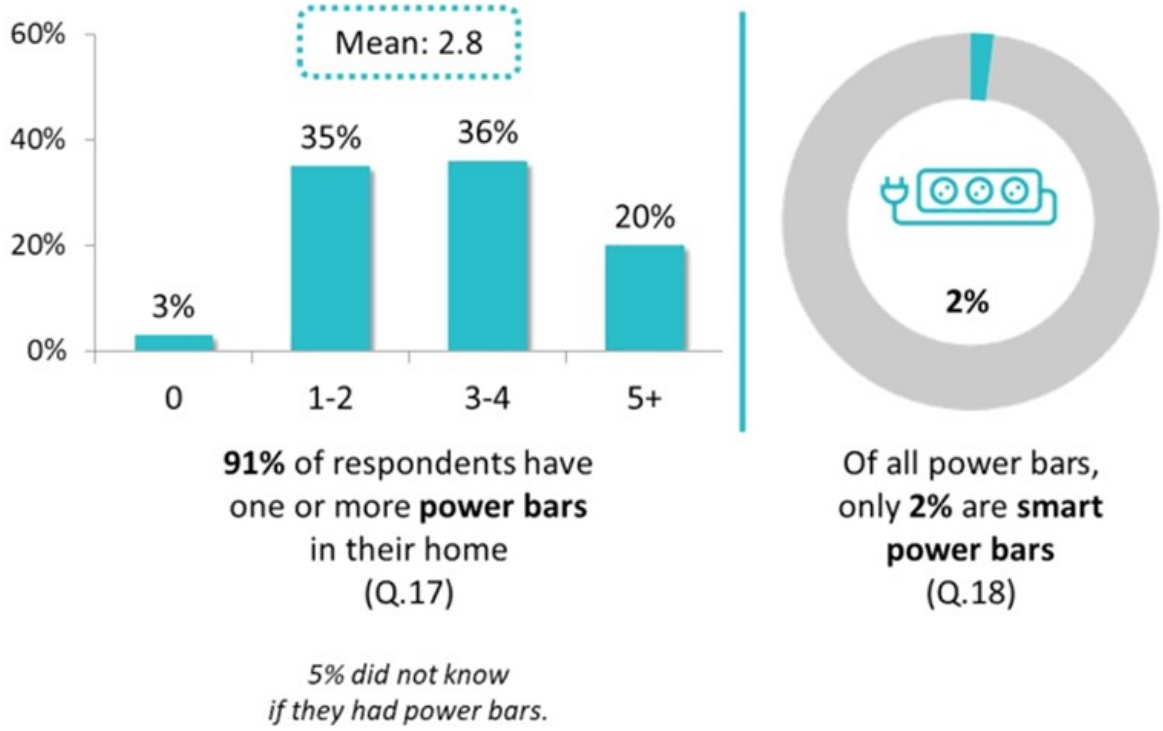


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2.7 Residential – Power Bars

As indicated in Figure 8, on average, respondents have three power bars in their homes, and almost none of them are smart power bars; and 20% of residents have five or more power bars in their home. A smart power strip (also called a smart power bar) looks similar to a traditional power bar, however circuitry is designed to monitor and control power to each electrical outlet in the strip to improve energy efficiency and prevent household electronics from wasting power.

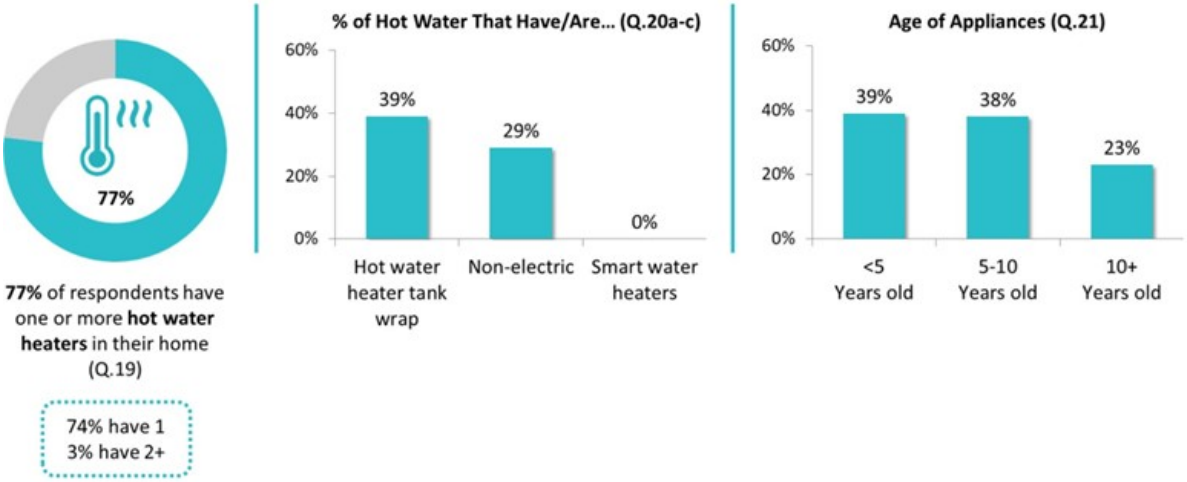
Figure 8. Residential Sector – Power Bars



2.8 Residential – Water Heaters

Figure 9 details the majority of respondents (77%) have a water heater in their home, with 29% being non-electric water heaters, and four in ten have a tank wrap. It is likely that the 23% of respondents who indicated not having a hot water heater have this supplied by a central hot water system in a multi-tenant building (for example, a multifamily building with a central boiler that provides hot water to individual tenant units). While the majority of water heaters in the province are less than 10 years old the survey found that no homes had a heat pump water heater or smart water heater connected to the internet.

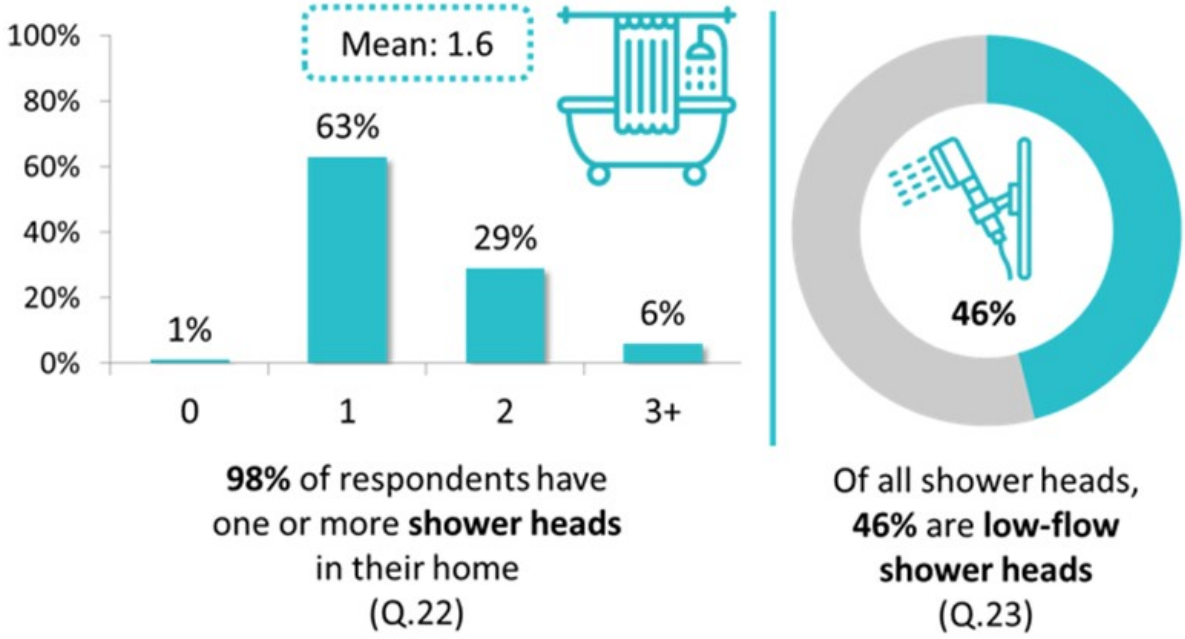
Figure 9. Residential Sector – Water Heaters



2.9 Residential – Shower Heads and Faucets

On average, respondents have two shower heads in their home (Figure 10) and report three faucets in their home, while a majority of faucets have a low flow aerator (Figure 11), just under one-half of shower heads are low-flow.

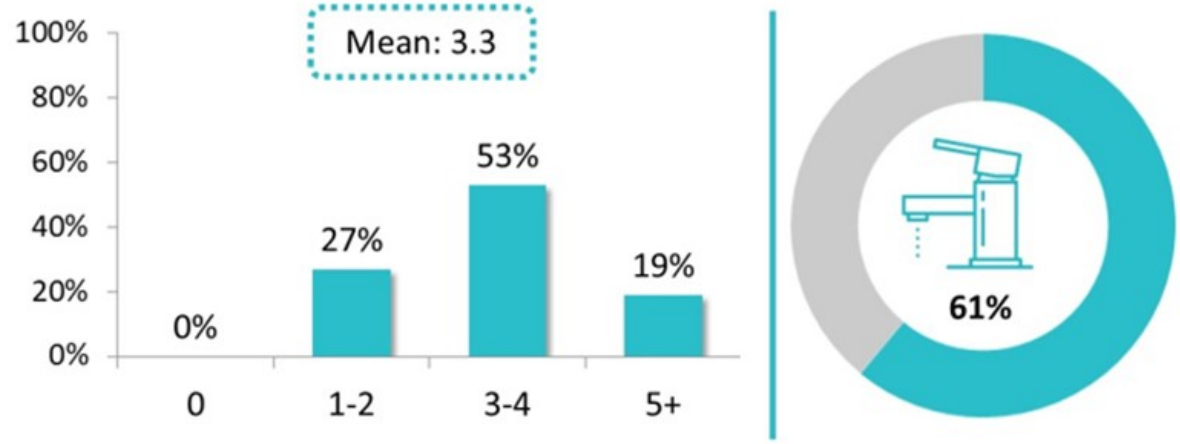
Figure 10. Residential Sector – Shower Heads



98% of respondents have one or more **shower heads** in their home (Q.22)

Of all shower heads, **46%** are **low-flow shower heads** (Q.23)

Figure 11. Residential Sector – Faucets



100% of respondents have one or more **water faucets** in their home (Q.24)

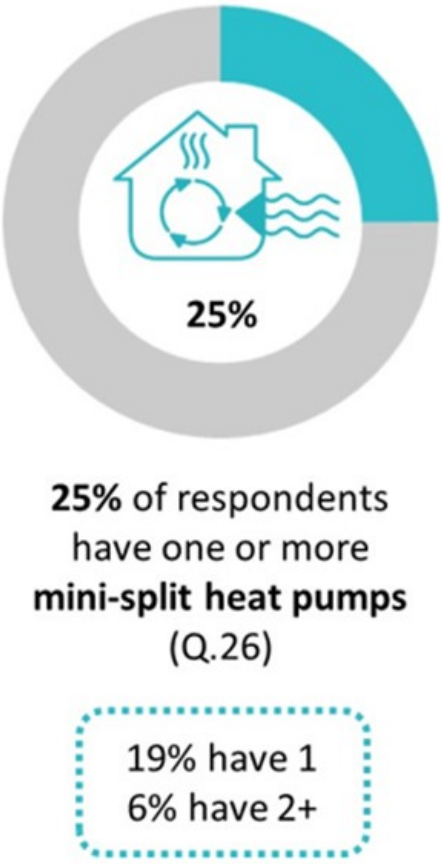
Of all faucet aerators, **61%** are **low-flow faucet aerators** (Q.25)

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2.10 Residential – Mini-Split Heat Pumps

As reported in Figure 12, one-quarter of respondents have at least one mini-split heat pump.

Figure 12. Residential Sector – Mini-Split Heat Pumps

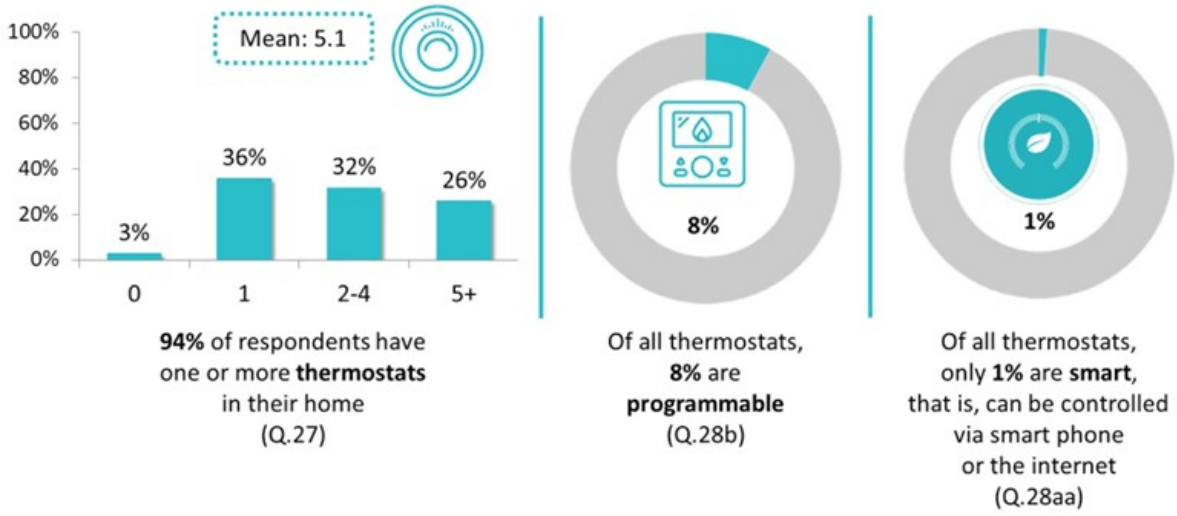


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2.11 Residential – Thermostats

Figure 13 shows that on average, respondents have five thermostats in their home (calibrated results), and virtually none of these thermostats are smart or programmable. It is likely that respondents considered each thermostat for each unit controlled (for example, each strip of electric resistance heat has its own on/off control).

Figure 13. Residential Sector – Thermostats

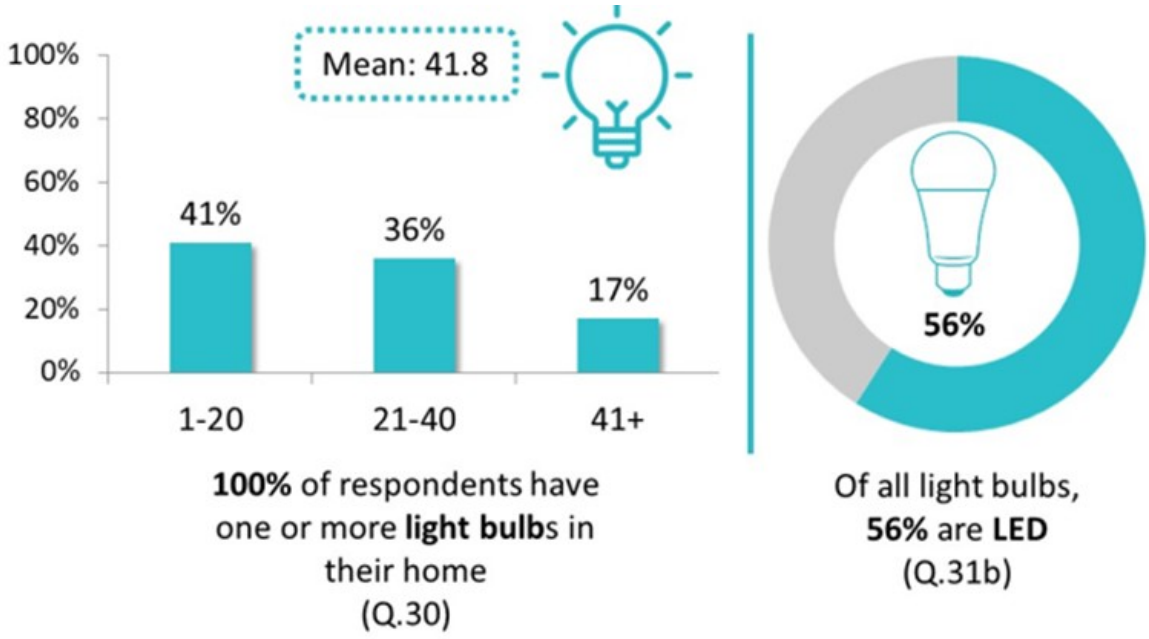


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2.12 Residential – Lighting

Figure 14 illustrates that survey respondents have 42 lightbulbs in their home on average (calibrated results), while more than one-half of lightbulbs in the province are LED. However, no bulbs were smart bulbs connected to the internet..

Figure 14. Residential Sector – Lighting

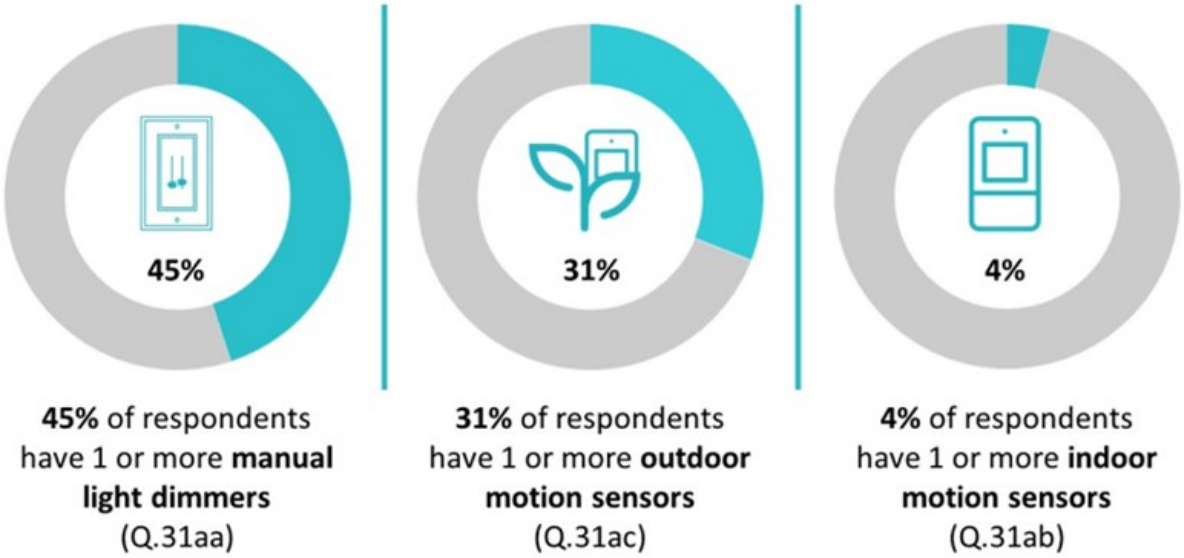


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2.13 Residential – Dimmers and Sensors

As seen in Figure 15, nearly one-half of respondents have at least one manual light dimmer in their home, while a slightly smaller number have at least one outdoor motion sensor. Very few respondents have indoor motion sensors in their home.

Figure 15. Residential Sector – Dimmers and Sensors

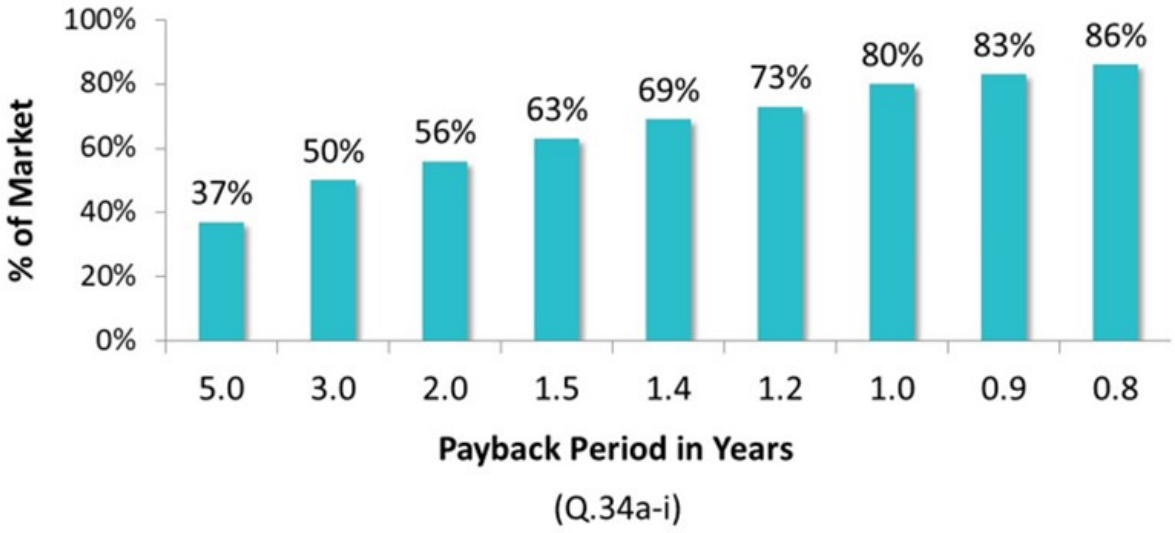


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2.14 Residential – Cost Savings (Lower Cost Project)

Figure 16 shows responses when residential respondents were asked – if a project were to cost $75 after rebates, a majority of respondents would likely pursue it if it saved them $35 or more annually, or if it had a 2 year payback period.

Figure 16. Residential Sector – Cost Savings (Lower Cost Project)



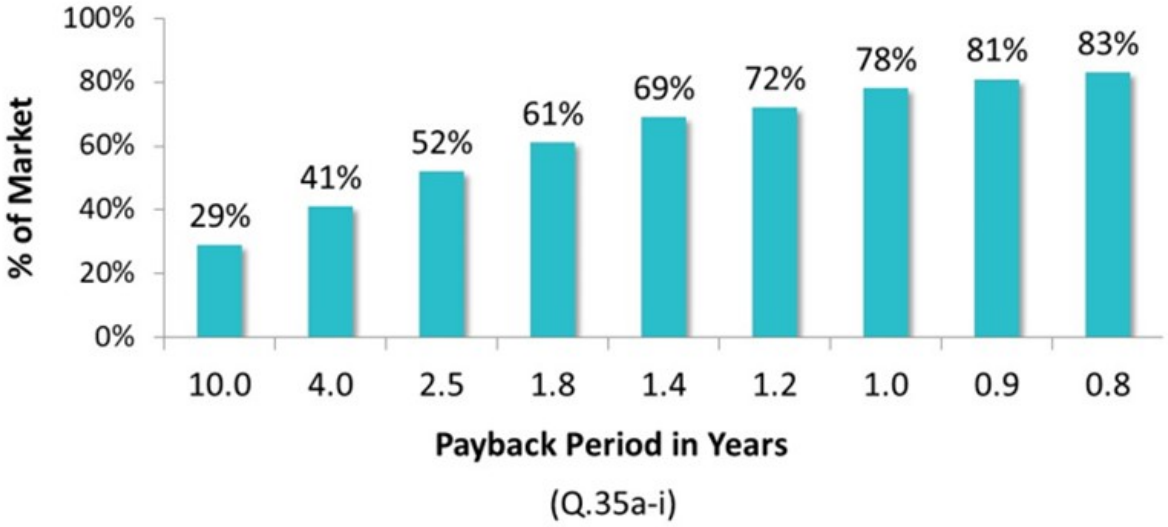
The payback period in years has been converted from annual savings in dollars.

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2.15 Residential – Cost Savings (Higher Cost Project)

Figure 17 shows responses when residential respondents were asked – if a project were to cost $1,000 after rebates, a majority of respondents would likely pursue it if it saved them $550 or more annually, or if it had an approximate 2 year payback period.

Figure 17. Residential Sector – Cost Savings (Higher Cost Project)

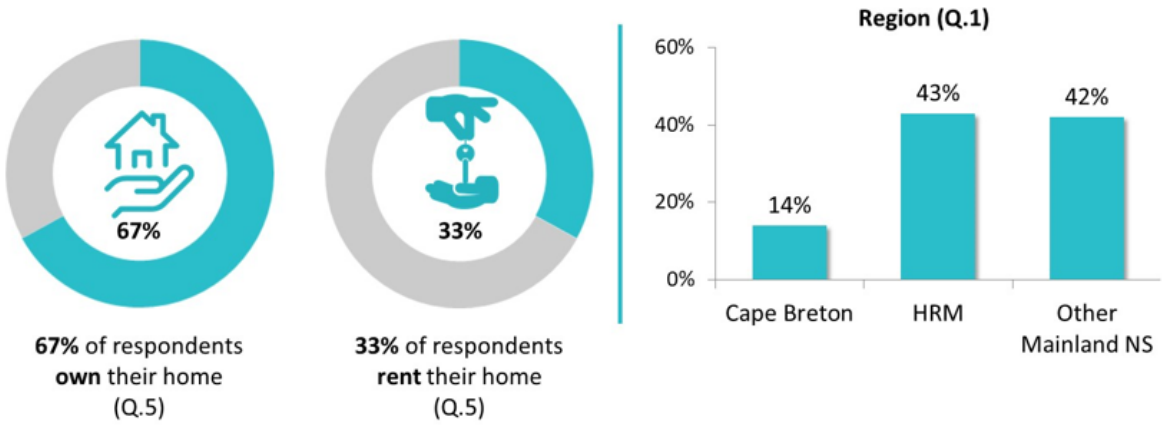


The payback period in years has been converted from annual savings in dollars.

2.16 Residential Sector Demographics

Residential survey participants participated from all three regional municipalities as shown in Figure 18.

Figure 18. Residential Sector – Home Ownership and Municipality of Residence



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Figure 19 shows an even distribution of male and female participants across all age groups with more respondents 55 years or older, followed by those 35 to 54 years of age, and then 18 to 34 years old.

Figure 19. Residential Sector – Gender and Age of Participants

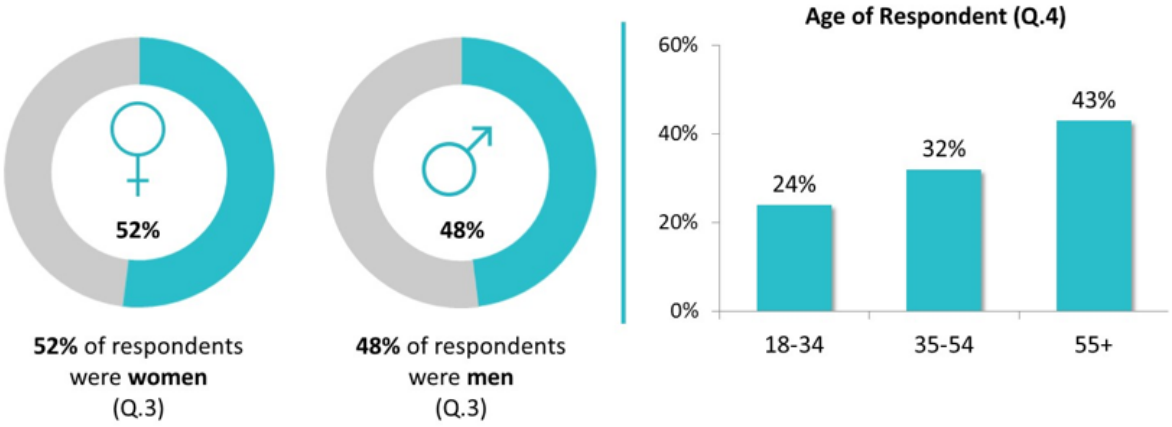
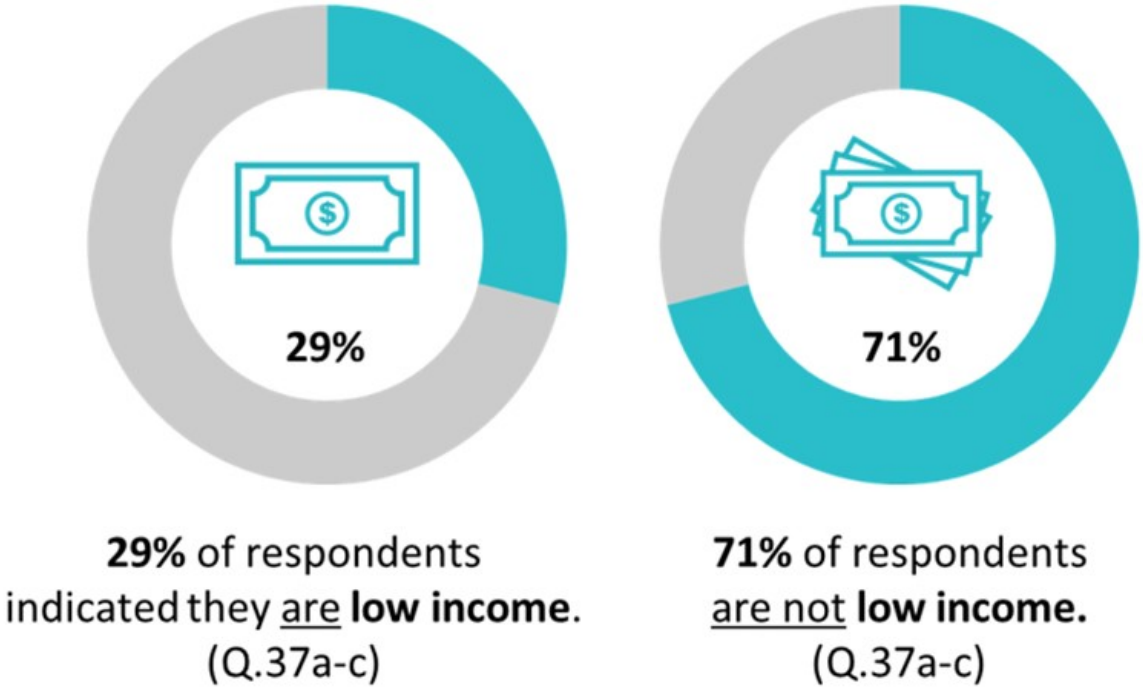


Figure 20 shows the distribution of households by income level, with 29 percent identified as low income based on Statistics Canada's low income cut-offs (LICO)measures.

Figure 20. Residential Sector – Household Income Type



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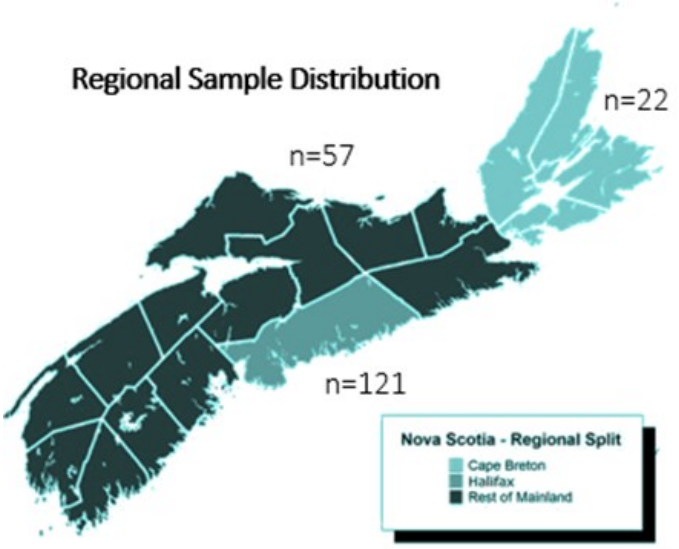
3. SUMMARY OF FINDINGS – BNI SECTOR

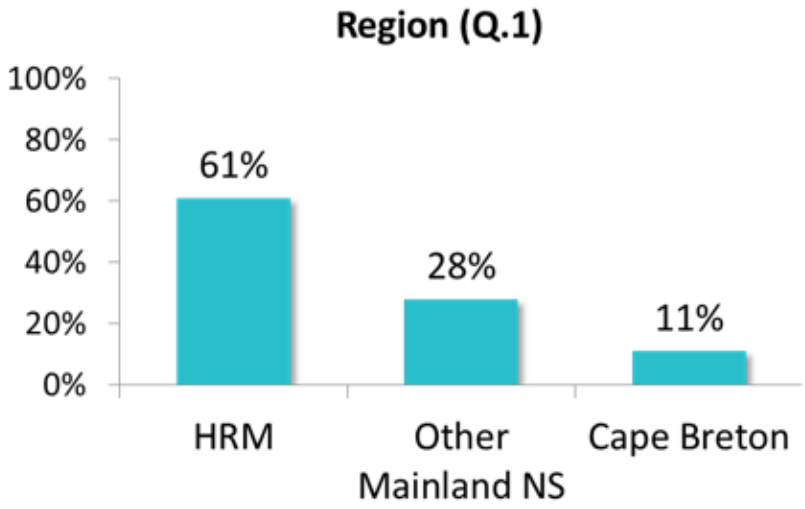
This section presents detailed findings from the business, nonprofit and institutional (BNI) sector online survey to assess baseline conditions in Nova Scotia facilities.

3.1 BNI Survey Responses by Region

Figure 21 shows the distribution of survey responses across the province, with 60.5% from the Halifax region, 28.5% from the rest of the mainland, and 11% from Cape Breton Island.

Figure 21. BNI Sector – Survey Responses by Region



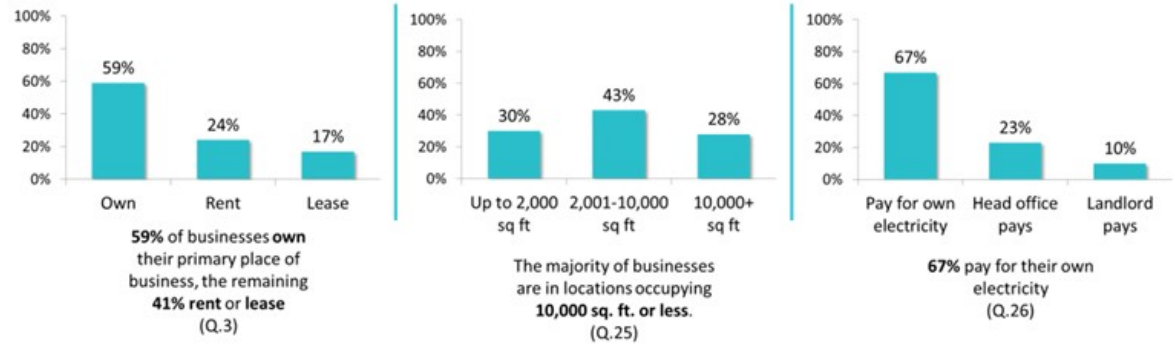


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3.2 BNI – Primary Business Location and Type

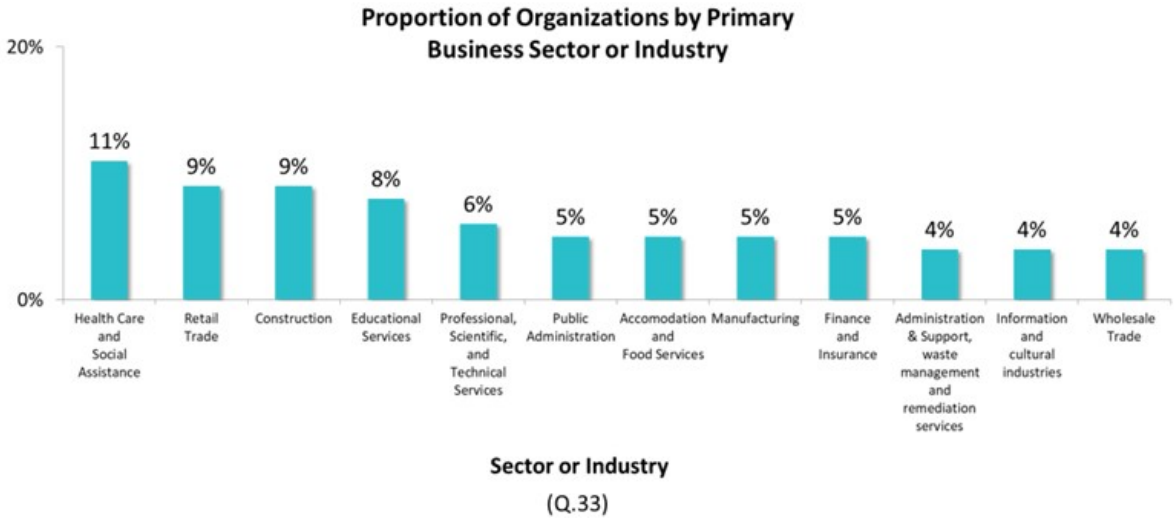
As shown in Figure 22, the majority of BNI respondents (59%) own their own primary place of business, occupy locations that are 10,000 square feet or less (73%), and pay for their own electricity (67%).

Figure 22. BNI Sector – Primary Place of Business

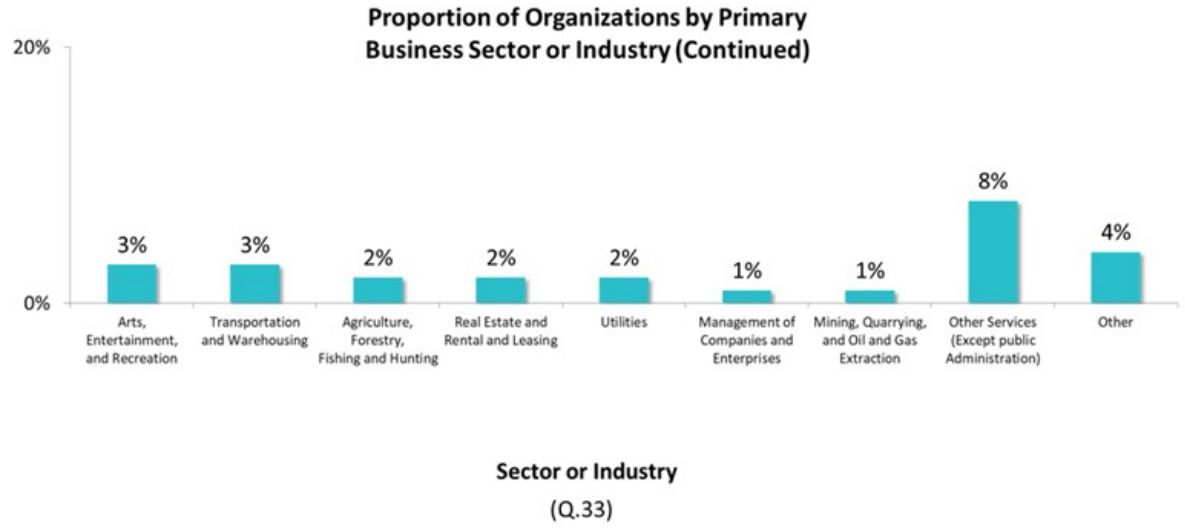


As shown in Figure 23, a variety of different primary sectors and industries are mentioned by respondents, with the most common being health care and social assistance, retail trade, construction, and educational services.

Figure 23. BNI Sector – Primary Business Sector or Industry



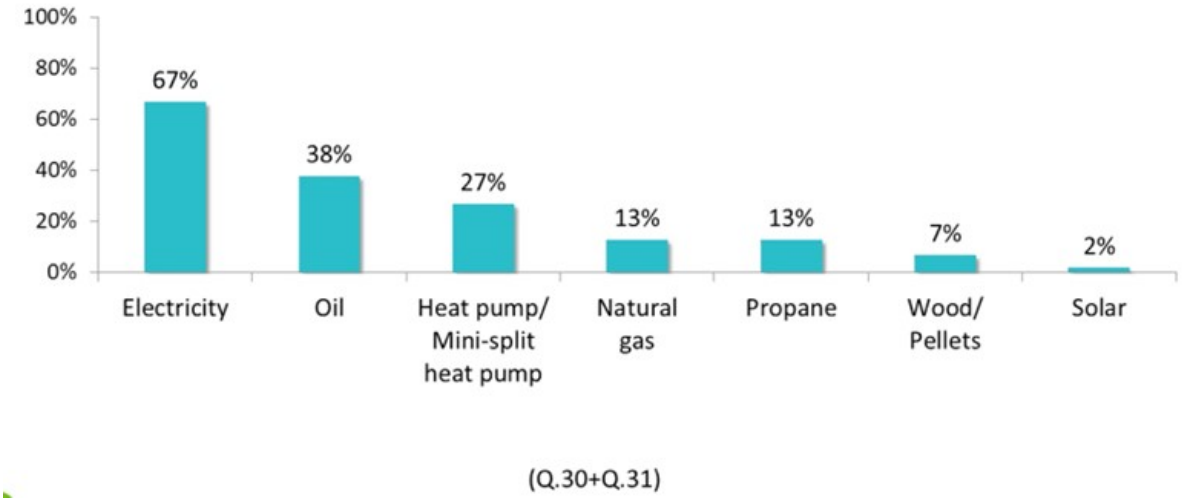
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3.3 BNI – Heating Source Types

Figure 24 presents a combination of both primary and secondary heating source types. The majority of Nova Scotian business respondents have electric heating systems (67%), followed by oil (38%), and then heat pump at 27%. Natural gas and propane both are at 13%, followed by wood/pellets (7%) and solar (2%).

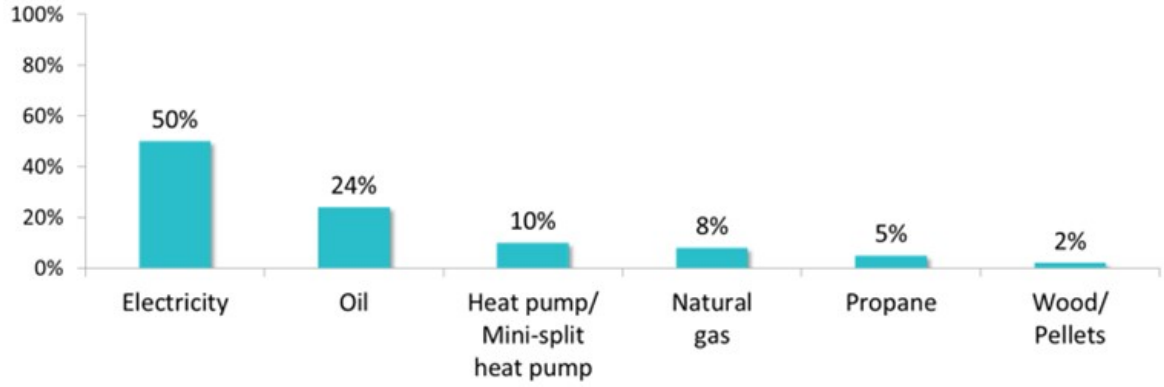
Figure 24. BNI Sector – Heating Source Fuel Types – All Sources



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Figure 25 presents primary heating source types. The majority of Nova Scotian business respondents use electricity for heat (50%), followed by oil (24%), and then heat pump (10%), natural gas (8%), propane (5%), followed by wood/pellets/chips (2%).

Figure 25. BNI Sector – Primary Heating Source Fuel Type

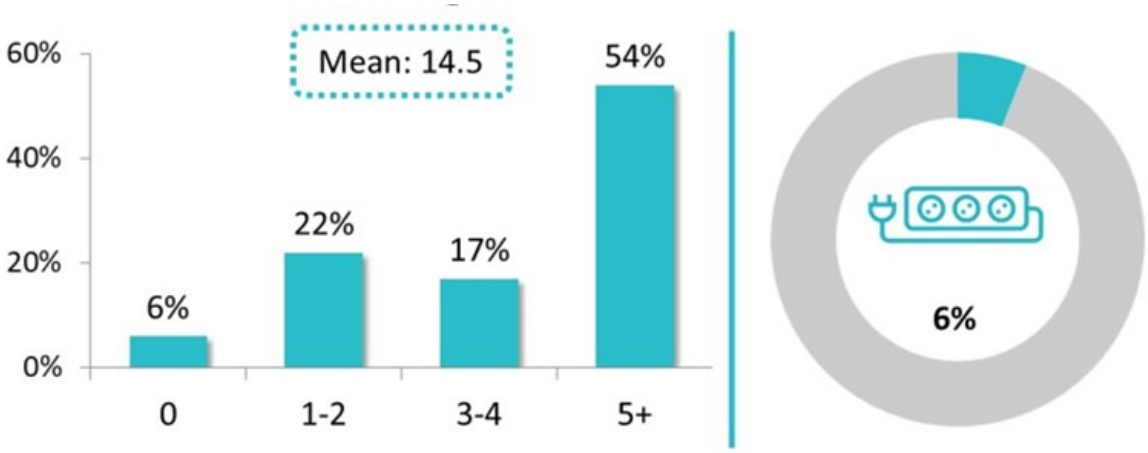


(Q.30)

3.4 BNI – Power Bars

As shown in Figure 26, on average, business respondents have almost 15 power bars, and the vast majority are not smart power bars (6%).

Figure 26. BNI Sector – Power Bars



94% of businesses have one or more **power bars** at their business (Q.4)

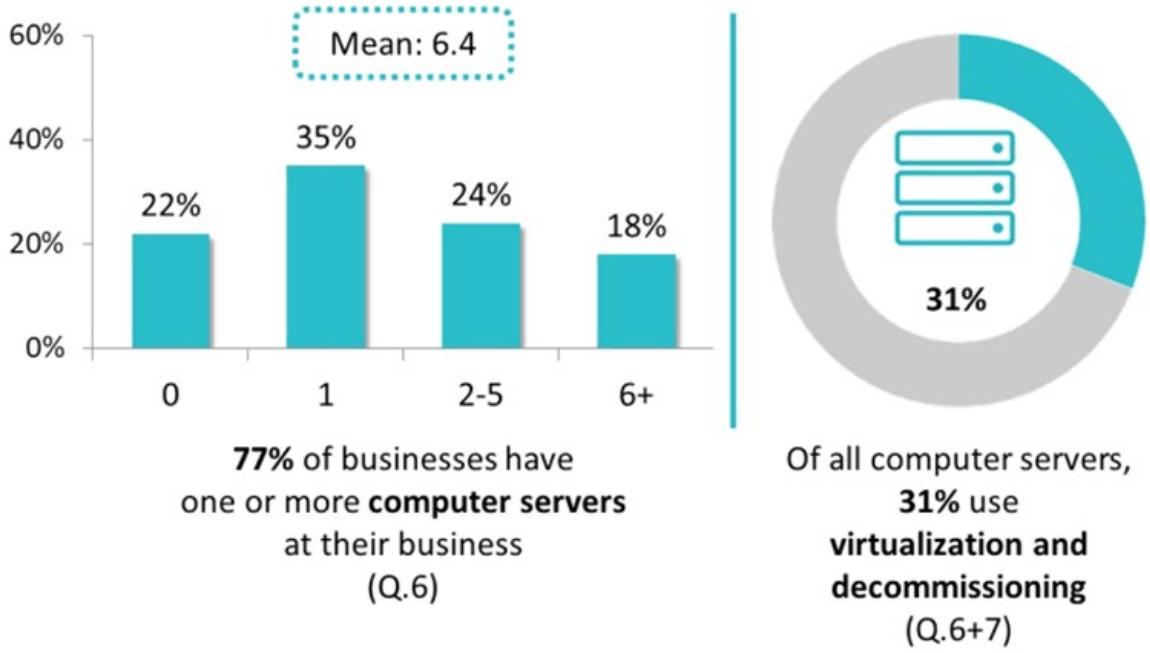
Of all power bars, only **6%** are **smart power bars** (Q.4+5)

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3.5 BNI – Computer Servers

As shown in Figure 27, on average, business respondents have more than six servers onsite, and approximately one-third of servers use virtualization and decommissioning.

Figure 27. BNI Sector – Computer Servers



77% of businesses have one or more **computer servers** at their business (Q.6)

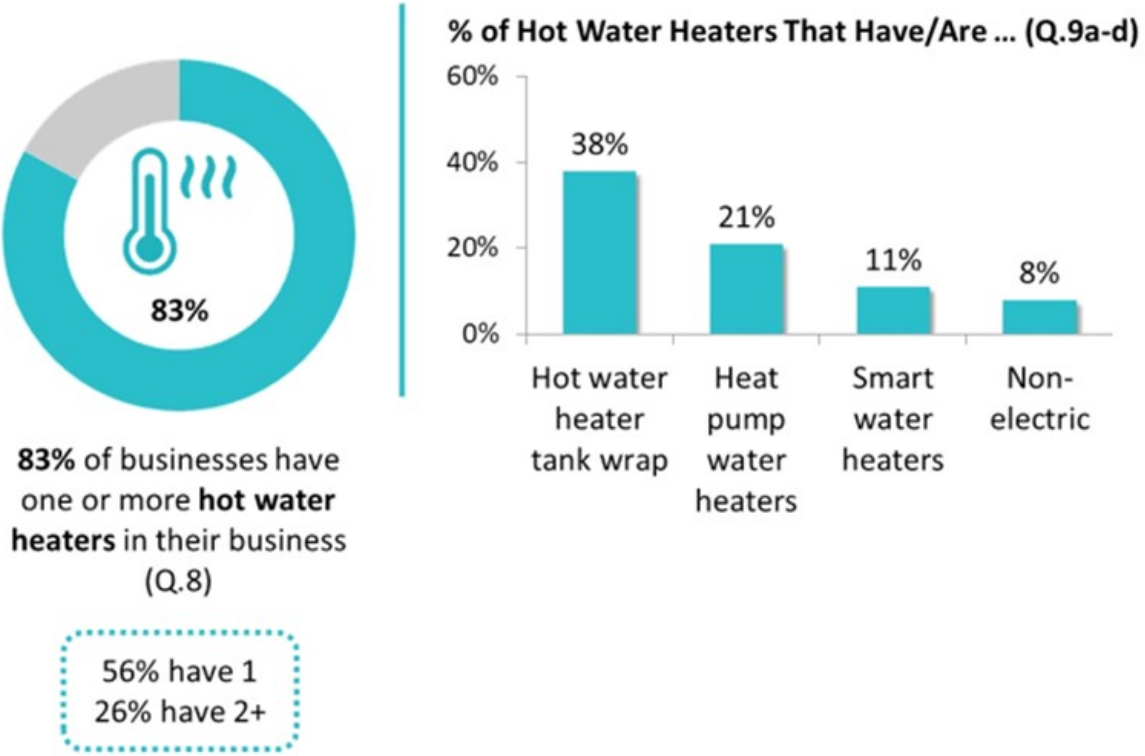
Of all computer servers, **31%** use **virtualization and decommissioning** (Q.6+7)

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3.6 BNI – Hot Water Heaters

As shown in Figure 28, most businesses (83%) have one or more hot water heaters, with approximately 40% of water heaters having a tank wrap. 21% are heat pump water heaters, and 11% are smart water heaters. 8% use a fuel other than electricity to heat water.

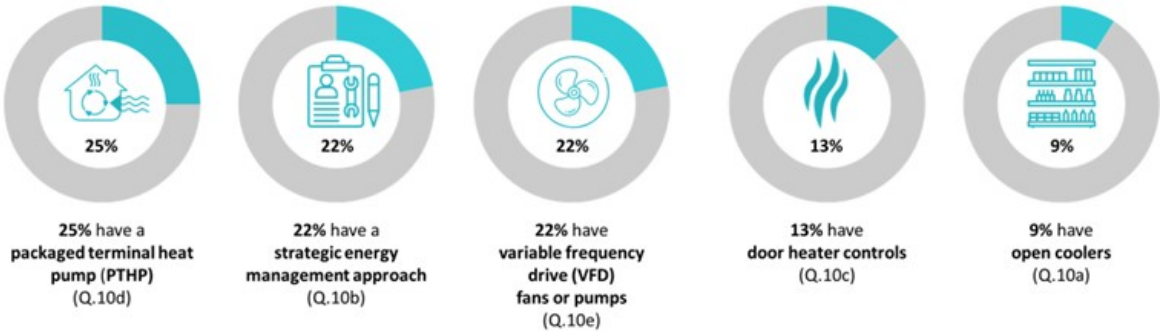
Figure 28. BNI Sector – Hot Water Heaters



3.7 BNI – Building Systems

Figure 29 presents the incidence of the application of different building systems. 25% of BNI respondents have one or more packaged terminal heat pumps, with a similar portion claiming having a strategic energy management approach. Variable frequency drive fans or pumps are present for 22% of respondents. Respondents indicated 13% of refrigeration units (e.g. coolers, freezers) have door heater controls and 9% are open coolers.

Figure 29. BNI Sector – Building Systems

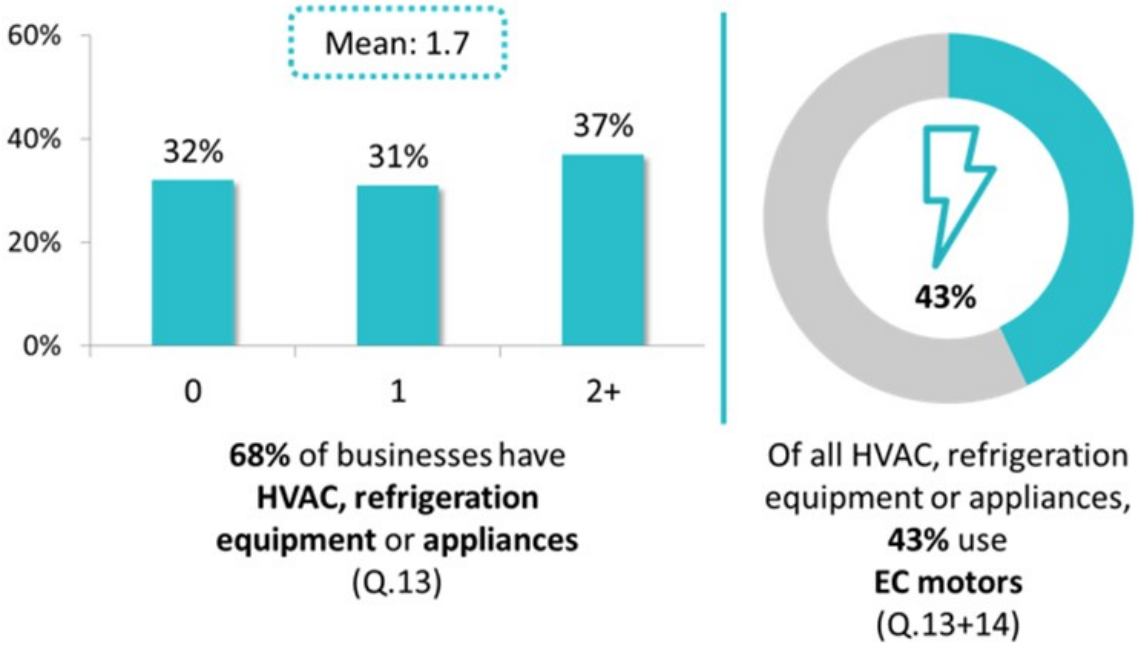


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3.8 BNI – HVAC

Figure 30 shows on average, BNI respondents have multiple types of HVAC units, refrigeration equipment or appliances, and 43% of these units use electrically commutated motors. It is likely that respondents who did not indicate having any units have these supplied by the facility at large for their floor area (for example, a central unit for a multi-tenant building which provides HVAC to terminal units in individual tenant spaces).

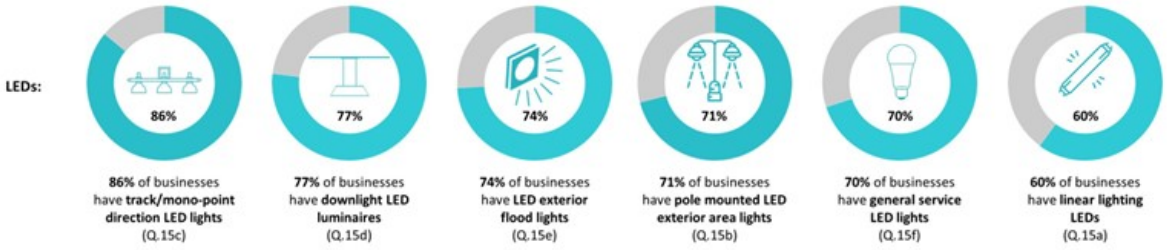
Figure 30. BNI Sector – HVAC



3.9 BNI – Lighting

Figure 31 presents data on the use of different types of LED lighting. Track/mono-point directional LED lighting (i.e. track lighting) is the most popular type of lighting among business respondents (88%), followed by downlight LED luminaires (77%), LED exterior floodlights (74%), pole mounted LED exterior area lights (71%), general service LED lights (70%), and linear lighting LEDs 60%).

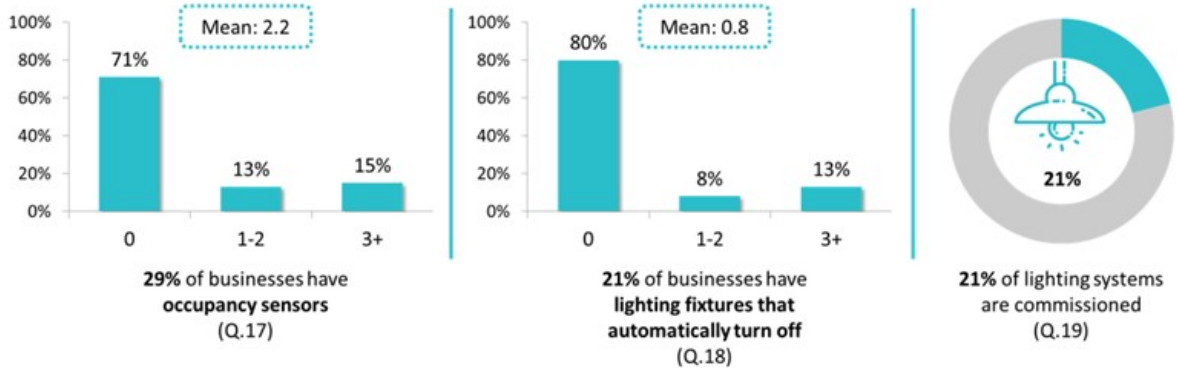
Figure 31. BNI Sector – LED Lighting



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Figure 32 shows the average number of occupancy sensors that BNI respondents report having is about two, and the majority of business respondents do not have automatic light fixtures. 21% of BNI respondents have had lighting systems commissioned.

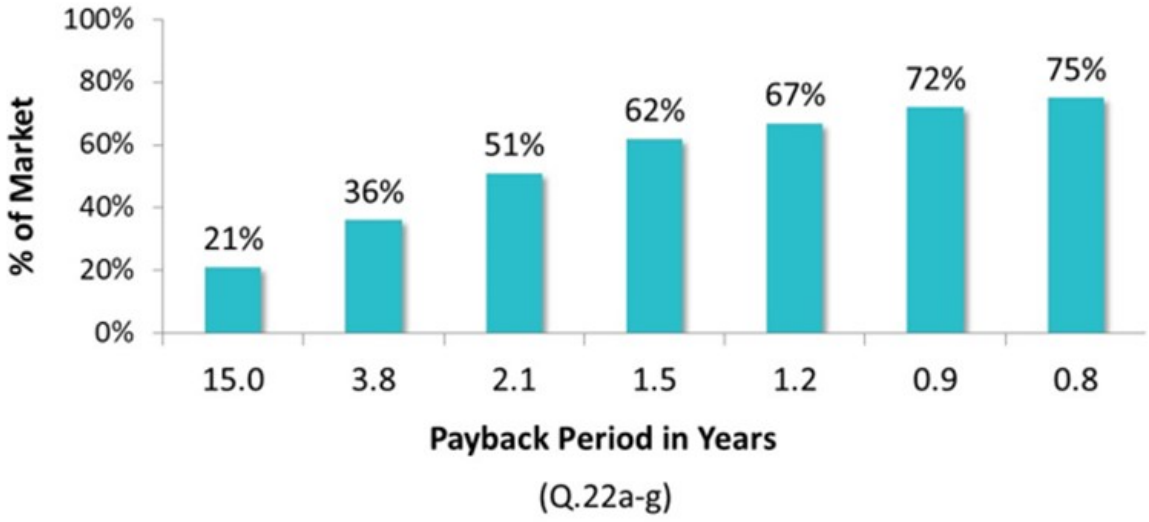
Figure 32. BNI Sector – Lighting Controls



3.10 BNI – Cost Savings (Lower Cost Project)

Figure 33 shows responses when businesses were asked – if a project were to cost $7,500 after rebates, that a majority of BNI respondents would likely pursue it if it saved them $5,000 or more annually, or had a 1.5 year payback period.

Figure 33. BNI Sector – Cost Savings (Lower Cost Project)



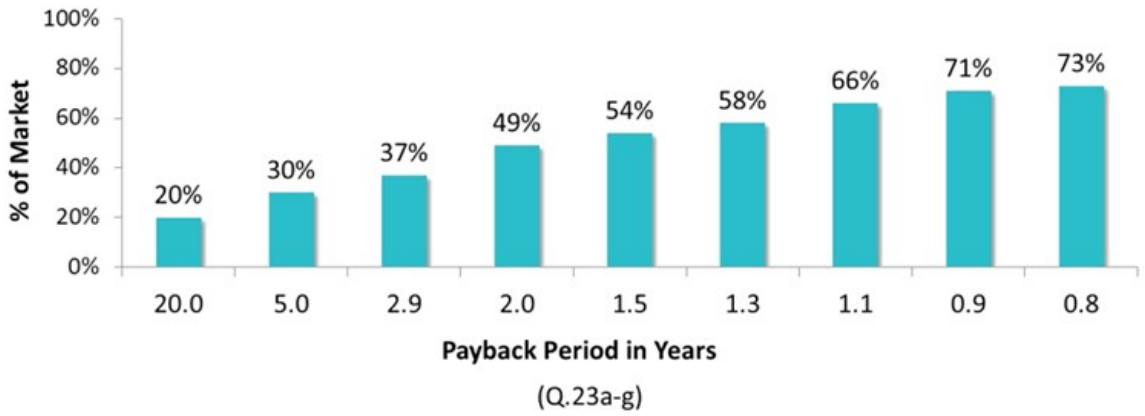
The payback period in years has been converted from annual savings in dollars.

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3.11 BNI – Cost Savings (Higher Cost Project)

Figure 34 shows responses when businesses were asked – if a project were to cost $100,000 after rebates, a majority of BNI respondents would likely pursue it if it saved them $65,000 or more annually, or had a 1.5 year payback period.

Figure 34. BNI Sector – Cost Savings (Higher Cost Project)



The payback period in years has been converted from annual savings in dollars.

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4. ONLINE SURVEY FINDINGS

This section presents online survey findings for the residential and BNI sector surveys.

4.1 Online Survey Residential Sector Findings

4.1.1 Basic Home Characteristics

This section summarizes the basic home characteristics of residential dwellings in Nova Scotia. **It is important to note that all data presented in this section is self-reported data gathered utilizing the residential sector online survey. No calibrated data is shown in the following tables.** Figure 35 summarizes the findings for basic home characteristics.

Figure 35. Residential Dwelling Type Profile

Characteristic	Market Characterization
Dwelling Type	Approximately 73% of all dwellings are single-family (detached, 64% and attached, 9%) homes. Approximately 19% of Nova Scotia residents live in a condominium, apartment or other multi-family dwelling with three units or more. Approximately 4% of Nova Scotia residents live in a mobile home or trailer. Approximately 3% of Nova Scotia residents live in a multi-family dwelling with two units.
Dwelling Ownership	The majority (67%) of all residents in Nova Scotia own their homes while the remaining 33% rent.
Dwelling Age	50% of homes in Nova Scotia were reported to be 35 years old or less, while 44% were reported to be 36 years old or older. 6% of respondents did not know the age of their home.
Household Income	29% of respondents indicated they are low income (low income cut-offs based on Statistics Canada measures). 71% of respondents are not low income.
Utility Bill Payment	89% of residents surveyed pay their own electricity bill.
Location	Halifax Regional Municipality – 43.4% Elsewhere in Mainland Nova Scotia – 42.1% Cape Breton Island – 14.5%

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4.1.2 Residential Lighting

A summary of the distribution of all lighting types for both interior and exterior lamps is shown in Figure 36. There was an average of 42 lamps installed per household, after on-site corrections were applied. The survey sought to identify a variety of different lamp types ranging from general service bulbs, linear fluorescent bulbs, specialty lighting, LED lighting and Smart or connected lighting. Additional information on manual dimming and both indoor and outdoor motion detectors was also collected.

Figure 36. Residential Lighting Characterization Profile

Measure / Characteristic	Market Share
General Service Bulbs	80% of light bulbs were general service bulbs.
Specialty Bulbs	Specialty bulbs accounted for an additional 13% of lighting..
Linear Fluorescent Bulbs	Respondents reported more than 7% of bulbs were linear fluorescent lights.
LEDs	Of all types of bulbs surveyed 59% were LED bulbs, and 2% of these bulbs were smart or connected to the internet.
Manual Dinning Controls	41% of residents surveyed had at least one manual dimmer in the home.
Indoor & Outdoor Motion Detection	5% of respondents had one or more indoor motion detectors; 31% had at least one outdoor motion detecting light.

4.1.3 Residential HVAC

Figure 37 summarizes the online survey findings for residential HVAC equipment.

Figure 37. Residential Heating Equipment Profile

Measure / Characteristic	Online Survey Findings
Electric Heating - Primary	33% of all primary heating systems are electric.
Electric Heating - Backup	62% of households have a secondary heating system installed. Of these, 26% use some form of electric heating as a backup source.
Fuel Oil Heating	31% of primary heating systems are fuel oil.
Programmable Thermostats	27% of residents surveyed reported having at least one programmable thermostat. Of those programmable thermostats 3% were connected to the internet.
Mini-Split Heat Pumps	Approximately 25% of all customers surveyed had at least one mini-split heat pump, 19% having a single unit and 6% having two or more units.

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4.1.4 Residential Water Heating and Water Conservation

Figure 38 presents details on the water heating equipment present in the surveyed homes.

Figure 38. Residential Water Heating Profile

Measure / Characteristics	Online Survey Findings
Electric Water Heating	71% of surveyed primary water heaters were electric resistance. 39% of water heaters were reported to be 5 years old or newer, while 38% were between 5 years and 10 years old, and 23% ten years old or older. 46% of all water heaters were reported to have a tank wrap.
Non-Electric Water Heating	Approximately 29% of water heaters surveyed had fuel types other than electric resistance.
Heat Pump and Smart Water Heating	Of the 1002 households surveyed online, 0 reported owning a heat pump water heater and 3% claimed to have a smart water heater.

A summary of shower heads and faucets is shown in Figure 39.

Figure 39. Residential Water Conservation Profile

Measure / Characteristic	Online Survey Findings
Shower Heads	92% of residential homes have one or two shower heads with 6% having more than two shower heads. 2% of respondents did not recall how many shower heads were present in the home. Of those shower heads, 64% of respondents reported that they had a low flow shower head(s) installed.
Faucets	Roughly a quarter of homes surveyed had either two or four faucets (25% each). 30% reported having three faucets and 19% reported five or more faucets. Of those faucets, 35% had at least one faucet aerator installed.

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4.1.5 Residential Appliances

Figure 40 summarizes the findings for all refrigerators, freezers and mini or wine refrigerators.

Figure 40. Residential Appliances Profile

Measure / Characteristic	Online Survey Findings
Residential Refrigerators	85% of all homes surveyed report having one full size refrigerator while 11% of respondents reported owning a second full sized refrigerator.
	29% of refrigerators are less than 5 years old. 42% at least 5 years but less than 10 years old, and 29% are 10 years or older.
Residential Freezers	55% of homes surveyed reported having one or more stand-alone freezer (not attached to their refrigerator). 36% of homes surveyed had no stand-alone freezers, 6% had two or more and 3% of respondents did not know how many freezers were in the home.
	24% of stand-alone freezers are less than 5 years old. 33% are at least 5 years but less than 10 years old, and 43% are 10 years or older.
Residential Mini Refrigerators or Wine Fridges	75% of homes reported having no mini refrigerator or wine fridge. 20% of homes reported having one such refrigerator and 2% reported having two or more.
	42% of mini refrigerator or wine fridges are less than 5 years old. 38% are at least 5 years but less than 10 years old, and 21% are 10 years or older.
Residential Clothes Washers	The majority (89%) of households surveyed have a single clothes washer, while 7% had no clothes washer, and 4% had two or more.
	Nearly 60% of residential respondents reported that their clothes washer was not a high efficiency machine. 27% of respondents had front loading high efficiency clothes washers, and 14% had high efficiency top loading clothes washers. 35% of clothes washers were reported to be 5 years old or newer, while 40% were between 5 years and 10 years old, and 25% 10 years old or older.
Residential Clothes Dryers	The majority (87%) of households surveyed have a single clothes dryer, while 8% had no clothes dryer and 3% had two or more.
	67% of residential respondents reported that their clothes dryer was not a heat pump dryer, while 17% indicated that they did own a heat pump clothes dryer. 29% of clothes dryers were reported to be 5 years old or newer, while 44% were between 5 years and 10 years old, and 27% ten years old or older.
Power Bars	96% of homes have at least one power bar – 1 (13%), 2 (22%), 3 (24%), 4 (12%) and 5 or more (20%). 6% of residential respondents reported that they had a smart power bar or one that turns off automatically when the room is empty.

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4.2 Business, Nonprofit and Institutional Sector Findings

The following sections present the results for BNI building characteristics.

4.2.1 BNI – General Building Information

A summary of general building information is listed in Figure 41.

Figure 41. BNI General Buildings Profile

Characteristic	Online Survey Findings
Facility Ownership	The majority (59%) of businesses own their facility, while 24% rent and 17% lease.
Utility Bill Payment	67% of facilities surveyed pay their own electricity bill, 23% pay through a head office or other department, and the landlord pays for 10% of those surveyed.
Building Size	18% of all BNI facilities are 1,000 sq. ft. or less. 12% of facilities are between 1,001 and 2,000 sq. ft. 21% of facilities are between 2,001 and 5,000 sq. ft. 22% of facilities are between 5,001 and 10,000 sq. ft. 14% of facilities are between 10,001 and 25000 sq. ft. 14% of facilities are 25,001 sq. ft. or greater.
Business Type	11% of BNI facilities are health care and social assistance. 9% of BNI facilities are retail trade. 9% of BNI facilities are construction. 8% of BNI facilities are educational services. 8% of BNI facilities are other services (except public administration). 6% of BNI facilities are professional, scientific, and technical services. 5% of BNI facilities are public administration. 5% of BNI facilities are accommodation and food services. 5% of BNI facilities are manufacturing. 5% of BNI facilities are finance and insurance. 4% of BNI facilities are administration and support, waste management and remediation services. 4% of BNI facilities are information and cultural industries. 4% of BNI facilities are wholesale trade. 3% of BNI facilities are arts, entertainment, and recreation. 3% of BNI facilities are transportation and warehousing. 2% of BNI facilities are agriculture, forestry, fishing and hunting. 2% of BNI facilities are real estate and rental and leasing. 2% of BNI facilities are utilities. 1% of BNI facilities are management of companies and enterprises. 1% of BNI facilities are mining, and oil and gas extraction. 4% of BNI facilities are other.

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Location	Halifax Regional Municipality – 60.5% Elsewhere in Mainland Nova Scotia – 28.5% Cape Breton Island – 11%

4.2.2 Lighting

Figure 42 lists findings for the BNI lighting profile in Nova Scotia.

Figure 42. BNI Indoor Lighting Profile

Measure / Characteristic	Online Survey Findings
Interior Fixture Types	LEDs comprise a significant portion of lighting systems, with Track/mono-point direction LED lights the most popular type of lighting among business respondents, followed by downlight LED luminaires, LED exterior floodlights, pole mounted LED exterior area lights, general service LED lights, and linear lighting LEDs..
Control Types	29% of facilities have occupancy sensors to control lighting. 21% have fixtures that can turn off automatically. 21% of lighting systems have been commissioned.

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4.2.3 Controlling Energy Usage

Figure 43 lists findings for controlling energy usage in BNI facilities..

Figure 43. BNI Controls Profile

Measure / Characteristic	Online Survey Findings
Power Bars	94% of respondents have at least one power bar, with an average of 15 power bars installed; the vast majority are not smart power bars, which comprise 6%.
Computer Servers	77% of respondents have a computer server onsite, with an average of 6 servers onsite; 31% of servers use virtualization and decommissioning.
Strategic Energy Management (SEM)	22% of respondents indicated they employ a Strategic Energy Management approach to addressing facility energy usage.
Variable Frequency Drive (VFD)	22% of respondents indicated fans and pumps have a Variable Frequency Drive .
Door Heater Control	13% of respondents indicated refrigeration units had door heater controls installed.
Electrically Commutated Motor (ECM)	43% of respondents indicated HVAC equipment, refrigeration equipment, or appliances had an ECM installed.

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APPENDIX B-1 – RESIDENTIAL SECTOR ONLINE SURVEY INSTRUMENT

Appendix B-1 includes the online survey instrument used to query Nova Scotians about the energy-related characteristics of their residential dwelling units.

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APPENDIX B-2 – BUSINESS, NONPROFIT AND INSTITUTIONAL SECTOR ONLINE SURVEY INSTRUMENT

Appendix B-2 includes the online survey instrument used to query Nova Scotia businesses, nonprofits and institutions about the energy-related characteristics of their facilities.

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APPENDIX B-3 – RESIDENTIAL SECTOR ONLINE SURVEY RESULTS

Appendix B-3 includes the tabulated results of the online survey for the residential sector.

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APPENDIX B-4 – BNI SECTOR ONLINE SURVEY RESULTS

Appendix B-4 includes the tabulated results of the online survey for the BNI sector.

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Quota of n=1,000 Nova Scotia residents 18 or older

ALL QUESTIONS ARE MANDATORY

ALL PROGRAMMING NOTES ARE PRESENTED IN BOLD CAPS

FOR ALL NUMERIC RESPONSES, RANGES ARE NOT ACCEPTED

NOTE: QUESTION NUMBERING VARIES BASED ON CHANGES TO THE SURVEY INSTRUMENT, QUESTION NUMBERING DISPLAYED CORRESPONDS WITH TABULAR RESULTS

efficiency NOVA SCOTIA is conducting a study to help understand Nova Scotia specific energy usage. Your responses will help Efficiency Nova Scotia improve energy-related programs that assist customers in saving energy and money, and ultimately benefit the environment.

All responses will be kept strictly anonymous and will be analyzed as a whole, not individually. No attempt will be made to identify you. We appreciate your feedback!

As you go through the survey, if you do not have a particular equipment type, please enter '0' in the quantity box.

Section A: Background/Ownership

To begin…

1. Do you reside in… **CODE ONE ONLY**

   1 Cape Breton Island
   2 Halifax Regional Municipality (HRM)
   3 Elsewhere on Mainland Nova Scotia outside HRM
   4 None of the above **THANK & TERMINATE**

2. What are the first three digits of your postal code? **[RECORD FIRST THREE DIGITS, MUST BE WITHIN NS]**

   98 Don't know/not sure

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3. Are you…? **ALLOW ONE RESPONSE**

1 Male
2 Female
3 Gender diverse
8 Prefer not to answer

4. Are you: **CODE ONE ONLY**

0 Under 18 **THANK AND TERMINATE**
1 18-24
2 25-34
3 35-44
4 45-54
5 55-64
6 65 or older
7 I prefer not to answer **THANK AND TERMINATE**

5. Do you currently own or rent your primary place of residence in Nova Scotia?
PRESENT IN ORDER – ALLOW ONE RESPONSE

1 Own (even if it is still being paid for)
2 Rent (even if no cash rent is paid)
7 Other **THANK & TERMINATE**
8 Don't know/Not sure **THANK & TERMINATE**

6. Which one of the following best describes your primary place of residence in Nova Scotia? **CODE ONE ONLY**

01 Single family detached house
02 Single family attached house such as a duplex, townhouse, or row house
03 Mobile home or trailer
04 Multi-family dwelling with two units
05 Condominium, apartment or other multi-family dwelling with three or more units
97 Other (please specify: _____)
98 Don't know /Not sure

Please note that in the remaining questions, home refers to your primary place of residence in Nova Scotia.

Section B: Appliances

Thinking of the appliances in your home…

7. How many **electric clothes dryers** do you have in your home?

   RECORD NUMBER_____

   98 Don't know

8. **[ONLY POSE IF '1' OR MORE IN Q.7**] Of this/these [**INSERT NUMBER FROM Q.7]** clothes dryer(s), how many are *heat pump dryers*? **[ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.7]**

   RECORD NUMBER_____

   98 Don't know

9. **[ONLY POSE IF '1' OR MORE IN Q.7**] Of this/these [**INSERT NUMBER FROM Q.7]** clothes dryer(s), how many are **[TOTAL FOR A TO C MUST EQUAL OR BE LESS THAN WHAT WAS ENTERED IN Q.7]**

   a. Less than 5 years old
   b. At least 5 years but less than 10 years old
   c. Ten years or older

   RECORD NUMBER_____

   98 Don't know

10. How many **clothes washers** do you have in your home?

    RECORD NUMBER_____

    98 Don't know

11. **[ONLY POSE IF '1' OR MORE IN Q.10]** Of this/these [**INSERT NUMBER FROM Q.10]** clothes washer(s), how many are: **[FOR EACH A TO C ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.10; SUM OF 'A' AND 'B' CANNOT EXCEED NUMBER ENTERED IN Q.10]**

	RECORD NUMBER	***Don't know***
a) *Front-loading?*	_____	O8
b) *Top-loading <u>with</u> an agitator in the tub?*	_____	O8
c) *Top loading <u>without</u> an agitator in the tub?*	_____	O8

12. **[ONLY POSE IF '1' OR MORE IN Q.10]** Of this/these [**INSERT NUMBER FROM Q.10]** clothes washer(s), how many are **[TOTAL FOR A TO C MUST EQUAL OR BE LESS THAN WHAT WAS ENTERED IN Q.10]**

a. Less than 5 years old
b. At least 5 years but less than 10 years old
c. Ten years or older

RECORD NUMBER_____

98 Don't know

13. How many of the following do you have in your home…

	RECORD NUMBER	***Don't know***
a) *Full-size refrigerators (Note: these do not include mini fridges or wine fridges)?*	_____	O8
b) *Mini refrigerators or wine fridges?*	_____	O8
c) *Stand-alone freezers, that is, freezers that are <u>not</u> attached to refrigerators?*	_____	O8

14. **[ONLY POSE IF '1' OR MORE IN Q.13A**] Of this/these [**INSERT NUMBER FROM Q.7]** full-size refrigerator(s), how many are **[TOTAL FOR A TO C MUST EQUAL OR BE LESS THAN WHAT WAS ENTERED IN Q.13A]**

    a. Less than 5 years old
    b. At least 5 years but less than 10 years old
    c. Ten years or older

    RECORD NUMBER_____

    98 Don't know

15. **[ONLY POSE IF '1' OR MORE IN Q.13B**] Of this/these [**INSERT NUMBER FROM Q.13B]** mini or wine refrigerator(s), how many are **[TOTAL FOR A TO C MUST EQUAL OR BE LESS THAN WHAT WAS ENTERED IN Q.13B]**

    a. Less than 5 years old
    b. At least 5 years but less than 10 years old
    c. Ten years or older

    RECORD NUMBER_____

    98 Don't know

16. **[ONLY POSE IF '1' OR MORE IN Q.13C**] Of this/these [**INSERT NUMBER FROM Q.13C]** stand-alone freezers(s), how many are **[TOTAL FOR A TO C MUST EQUAL OR BE LESS THAN WHAT WAS ENTERED IN Q.13C]**

    a. Less than 5 years old
    b. At least 5 years but less than 10 years old
    c. Ten years or older

    RECORD NUMBER_____

    98 Don't know

Section C: Consumer Electronics

17. How many **power bars** do you have in your home? A power bar is a block of electrical sockets that attaches to the end of a flexible cable allowing multiple electrical devices to be powered from a single electrical socket. **DISPLAY POWER STRIP IMAGE**

RECORD NUMBER_____

98 Don't know

18. **[POSE ONLY IF 1 OR MORE IN Q.17]** Of this/these [**INSERT NUMBER FROM Q.17]** power bar(s), how many are smart power bars, that is, can be controlled via smart phone or computer or turn off automatically when you leave the room? **DO NOT ALLOW NUMBER ENTERED TO EXCEED NUMBER ENTERED IN 17**

RECORD NUMBER:_____
98 Don't Know

Section D: Domestic Hot Water

19. How many **hot water heaters** do you have in your home?
RECORD NUMBER_____

98 Don't know

20. [**ONLY POSE IF 1 OR MORE IN Q.19**] Of this/these [**INSERT NUMBER FROM Q.19]** hot water heater(s), how many: **[FOR EACH A TO C ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.19]**

	RECORD NUMBER	***Don't know***
a) Have a large metal duct for exhaust gas?	_____	○8
b) Are smart water heaters, that is, they can be controlled over the internet via a smart phone or computer?	_____	○8
c) Have a hot water heater tank wrap, that is, have insulation overtop of the metal exterior of the tank?	_____	○8

20d. **[DO NOT POSE IF Q20A=TOTAL ENTERED IN Q19]** Of this/these remaining **[INSERT NUMBER Q19 TOTAL MINUS Q20A TOTAL]** hot water heaters, how many are heat pump water heaters?

RECORD NUMBER:_____
98 Don't know/Not sure

21. **[ONLY POSE IF '1' OR MORE IN Q.19**] Of this/these [**INSERT NUMBER FROM Q.19]** hot water heater(s), how many are **[TOTAL FOR A TO C MUST EQUAL OR BE LESS THAN WHAT WAS ENTERED IN Q.19]**

a. Less than 5 years old
b. At least 5 years but less than 10 years old
c. Ten years or older

RECORD NUMBER_____

98 Don't know

22. How many **shower heads** do you have in your home?

RECORD NUMBER_____

98 Don't know

23. **[POSE ONLY IF 1 OR MORE IN Q.22]** Of this/these **[INSERT NUMBER FROM Q.22]** shower head(s), how many are low-flow, that is, they use less water to reduce your water usage? **[ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.22]**

RECORD NUMBER_____
98 Don't know

24. How many **water faucets** do you have in your home?

RECORD NUMBER_____

98 Don't know

25. **[POSE ONLY IF 1 OR MORE IN Q.24]** Of this/these [**INSERT NUMBER FROM Q.24**] faucet(s), how many have low-flow faucet aerators? Faucet aerators attach to the tip of the faucets to prevent splashing, conserve water, and reduce energy costs. **[ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.24]**

RECORD NUMBER_____

98 Don't know

Section E: Heat pumps

26. How many **mini-split heat pumps** do you have at your home? Please count only the **exterior condensing units** at your home. For example, if you have multiple indoor blowers connected to a single exterior unit, then this would be counted as one.

GRAPHIC WILL HAVE ARROW POINTING TO INTERIOR AND EXTERIOR UNITS

RECORD NUMBER_____

98 Don't know

Section F: Whole Home

27. How many **thermostats** does your home have to change the indoor temperature?

RECORD NUMBER_____

98 Don't know

28. **[POSE ONLY IF 1 OR MORE IN Q.27]** Of this/these **[INSERT NUMBER FROM Q.27]** thermostat(s), how many are: **[ONLY ALLOW NUMBER FOR EACH EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.21]**

	RECORD NUMBER	***Don't know***
b) programmable, that is, you can set schedules to control the temperature?	_____	○8

28aa. **[POSE ONLY IF 1 OR MORE IN Q 28B]** Of this/these **[INSERT NUMBER FROM Q.28B]** *programmable* thermostat(s), how many are

	RECORD NUMBER	***Don't know***
a) smart thermostats you can control via a cell phone or the internet?	_____	○8

29. How many, if any, of the following does your home have?

	RECORD NUMBER	Don't know
a) Dehumidifier	_____	○8
b) Clothes line	_____	○8
c) Wood stove	_____	○8

Section G: Lighting

30. Please walk around your home and count all light bulbs, including those in closets, attics, garages, outdoor lights, etc. Please take note of how many bulbs are LED, how many screw into traditional light sockets, how many have a special screw-in base, how many are linear fluorescents (i.e., tube lights), and how many are smart lights.

Next, please indicate the total number of lightbulbs you have:

RECORD NUMBER_____
98 Don't know/Not sure

31. Next, please indicate…. **DO NOT ALLOW NUMBERS ENTERED IN 'B' OR 'D' EXCEED VALUE ENTERED IN 30. DO NOT ALLOW THE SUM OF C+D TO EXCEED Q30**

	RECORD NUMBER	Don't know
b) How many are LED bulbs?	_____	○8
c) How many have a base sized like a normal light bulb, that is, they screw into your regular light sockets? **INSERT IMAGE**	_____	○8
d) How many have a specialty base? For example, a candelabra or are pin based?	_____	○8
e) How many are smart lights, that is, they can be controlled over the internet via a smart phone or computer?	_____	○8
f) How many are linear fluorescents (i.e., tube lights) **INSERT IMAGE**	_____	○8

31a. How many of the following are in your home?

	RECORD NUMBER	*Don't know*
a) Manual light dimmers **DISPLAY IMAGE**	_____	○8
b) Indoor motion sensors that activate/turnoff lights	_____	○8
c) Outdoor motion sensors that activate/turn off lights **DISPLAY IMAGE**	_____	○8

Section H: Willingness/Awareness

RANDOMIZE ORDER OF 32-35 & 33-34

32. Before today, how familiar were you with: **ROTATE LIST; RANDOMLY POSE ONLY ONE OF THESE ITEMS**

	0 - Completely Unfamiliar	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 – Completely familiar**
a. Heat Pump Water Heaters											
b. ENERGY STAR Mini Split Heat Pumps											
c. Heat Pump Clothes Dryers											
d. Energy Efficient Clothes Washers											

35. Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new **[INSERT RANDOM SELECTION OF ITEM FROM Q.32].** Would you generally pursue an energy efficiency project where the cost to you after utility rebates is **$1,000** if the project saved $[**INSERT RANDOM AMOUNT FROM TABLE BELOW**] per year?

IF 'YES,' DECREASE AND ASK UNTIL 'NO' OR NONE REMAINING. IF 'NO,' INCREASE AND ASK UNTIL 'YES,' OR NONE REMAINING

	Yes	*No*	*Don't know*
a) $100	O1	O2	O8
b) $250	O1	O2	O8
c) $400	O1	O2	O8
d) $550	O1	O2	O8
e) $700	O1	O2	O8
f) $850	O1	O2	O8
g) $1000	O1	O2	O8
h) $1,150	O1	O2	O8
i) $1,300	O1	O2	O8

33. Before today, how familiar were you with: **ROTATE LIST; RANDOMLY POSE ONLY ONE OF THESE ITEMS**

	0- Completely Unfamiliar	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 – Completely Familiar**
a. Networked/Connected – Indoor LED lights (i.e., smart lightbulbs)											
b. LED Screw-in General Service Lights (i.e., LED lights that screw into your existing sockets)											
c. Smart Power Bars											
d. Dimmer Switches											
e. Programmable or Smart thermostats											
f. Occupancy Sensors											
g. Low flow Showerheads											
h. Low-Flow Faucet Aerators											
i. Outdoor Motion Sensors											

34. Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be **[INSERT RANDOM SELECTION OF ITEM FROM Q.33]**. Would you generally pursue an energy efficiency project where the cost to you after utility rebates is **$75** if the project saved $[**INSERT RANDOM AMOUNT FROM TABLE BELOW**] per year?

IF 'YES,' DECREASE AND ASK UNTIL 'NO' OR NONE REMAINING. IF 'NO,' INCREASE AND ASK UNTIL 'YES,' OR NONE REMAINING

	Yes	*No*	*Don't know*
a) $15	O1	O2	O8
b) $25	O1	O2	O8
c) $35	O1	O2	O8
d) $45	O1	O2	O8
e) $55	O1	O2	O8
f) $65	O1	O2	O8
g) $75	O1	O2	O8
h) $85	O1	O2	O8
i) $95	O1	O2	O8

Section I: Demographics

And now, some questions to help us classify our results. Please remember that all information is confidential and anonymous – this information will not be identified in any way with your responses.

36. Including yourself, how many household members live in your home?

a. Number of adults 18 or older **[RECORD NUMBER]**

b. Number of children under age of 18 **[RECORD NUMBER]**

37a. [**POSE IF TOTAL IN Q36 A AND B=1]** Was your household income before taxes last year below $21,822?

1 Yes
2 No
3 Prefer not to say
98 Don't know/Not sure

37b. [**POSE IF TOTAL IN Q36 A AND B=2 TO 4]** Was your household income before taxes last year below $40,548?

1 Yes
2 No
3 Prefer not to say
98 Don't know/Not sure

37c. [**POSE IF TOTAL IN Q36 A AND B=5 or more]** Was your household income before taxes last year below $57,747?

1 Yes
2 No
3 Prefer not to say
98 Don't know/Not sure

38. Do you live within a First Nations Community?

1 Yes
2 No
3 Prefer not to say
98 Don't know/Not sure

39. What is the ***main*** source of energy used to heat your principal place of residence? **RANDOMIZE PRESENTATION, KEEPING "OTHER" AND "DON'T KNOW" LAST – CODE ONE ONLY**

01 Oil
02 Electricity
03 Heat pump/Mini-split heat pump
04 Wood/pellets
05 Propane
06 Natural gas
07 Solar
98 Don't know/No answer
99 Other [**SPECIFY**: _____]

40. **[DO NOT POSE IF "DON'T KNOW/NOT SURE" IN Q.39]** What other types of heating, if any, do you currently have for your principal place of residence? Please select all that apply. **PRESENT IN SAME ORDER AS Q.34 –ALLOW MULTIPLE RESPONSES – DO NOT DISPLAY ANY ITEMS ALREADY SELECTED IN Q 41**

01 Oil
02 Electricity
03 Heat pump/Mini-split heat pump
04 Wood/pellets
05 Propane
06 Natural gas
07 Solar
99 Other [**SPECIFY**: _____]
97 None – no other type of heating is used in my home
98 Don't know/Not sure

41. **[POSE IF 'ELECTRICITY' IN Q 39 OR 40]** What type of electric heating does your residence use? **CODE ONE ONLY**

1 Electric Baseboards *(e.g., small electric heaters, places throughout your building, typically under windows)*
2 Electric resistance Furnace *(i.e., a central furnace which uses an electric heating element and distributes heat through forced-air)*
3 Electric resistance Boiler *(i.e., a central furnace which uses an electric heating element and distributes heat through hot water, to your floor or radiators)*
4 Central Air-Source Heat Pump *(i.e., a central heat pump system that heats all or most of the building, through distributed hot water or hot air)*
5 Ductless/Mini-Split Heat Pump *(i.e., a heat pump system that has an indoor unit placed on a wall, that typically only heats a small area of the building)*
6 Ground-Source Heat Pump *(i.e., a central heat pump that collects heat from tubes in the ground outside of your building)*
7 Other *(Please Specify:_____)*
98 Don't Know/Not Sure

42. **[POSE ONLY IF 'OWNED' IN Q.5]** And approximately how many years old is your home?

Number of years: _____ years
98 Don't know/Not sure

43. Does your household pay for its own electricity or does someone else pay for it?

1 Household pays for it
2 Someone else pays for it
4 Don't know/Not sure

That concludes the survey. Thank you for your assistance and input. It is greatly appreciated!



Quota of n=200 Nova Scotia Businesses

SOFT QUOTAS ON REGION

ALL PROGRAMMING NOTES ARE PRESENTED IN BOLD CAPS

FOR ALL NUMERIC RESPONSES, RANGES ARE NOT ACCEPTED

ALL QUESTIONS ARE MANDATORY

NOTE: QUESTION NUMBERING VARIES BASED ON CHANGES TO THE SURVEY INSTRUMENT, QUESTION NUMBERING DISPLAYED CORRESPONDS WITH TABULAR RESULTS



is conducting a study to help understand Nova Scotia specific energy usage. Your responses will help Efficiency Nova Scotia improve energy-related programs that assist Nova Scotians in saving energy and money, and ultimately benefit the environment.

All responses will be kept strictly anonymous and will be analyzed as a whole, not individually. No attempt will be made to identify you. We appreciate your feedback!

As you go through the survey, if you do not have a particular equipment type, please enter '0' in the quantity box.

Section A: Background/Characteristics

To begin…

1. Please indicate in which of the following areas your business is located. If your business has multiple locations, please indicate the location at which you work specifically. **CODE ONE ONLY**

   1 Cape Breton Island
   2 Halifax Regional Municipality (HRM)
   3 Elsewhere on Mainland Nova Scotia outside HRM
   4 None of the above **THANK & TERMINATE**

2. What are the first three digits of your business' postal code? **RECORD FIRST THREE DIGITS**

   98 Don't Know/Not sure

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For the remainder of the survey, please think about the business location where you personally work.

3. Do you currently own, lease, or rent the premises at your business' Nova Scotia location where you work?
PRESENT IN ORDER – ALLOW ONE RESPONSE

1 Own
2 Lease
3 Rent
8 Don't know/Not sure

Section B: Electronics

Thinking about your business' electronics…

4. How many **electrical power bars** do you have at your business' Nova Scotia location where you work? A power bar is a block of electrical sockets that attaches to the end of a flexible cable allowing multiple electrical devices to be powered from a single electrical socket.

RECORD NUMBER_____

98 Don't know/Not sure

5. **[POSE ONLY IF 1 OR MORE IN Q.4]** Of this/these **[INSERT NUMBER FROM Q.4]** power bar(s), how many… **[ONLY ALLOW NUMBER FOR EACH EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.4]**

	RECORD NUMBER	***Don't know***
b) Are smart power bars, that is, can be controlled via smart phone or computer or turn off automatically when you leave the room?	_____	○8

6. How many **computer servers** does your business have onsite at your business' Nova Scotia location where you work? There may be many servers on a single rack, but we want to know the number of individual servers.
RECORD NUMBER_____

98 Don't know/Not sure

7. **[POSE ONLY IF 1 OR MORE IN Q6]** Of this/these **[INSERT NUMBER FROM Q.6]** server(s), how many use server virtualization and decommissioning? Server virtualization is a way of reducing the number of physical computer servers by running multiple, independent operating systems on a single server.

[ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.6]
RECORD NUMBER_____

98 Don't know/Not sure

Section C: Hot Water Heaters

8. How many **hot water heaters** do you have for your business' Nova Scotia location where you work? **RECORD NUMBER**

98 Don't know/Not sure

9. **[POSE IF 1 OR MORE IN Q.8]** Of this/these hot water heater(s), [**INSERT NUMBER FROM Q.8**] hot water heater(s), how many: [**FOR EACH A TO E ONLY ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.8]**

	RECORD NUMBER	***Don't know***
a) Have a large duct for exhaust gas?	_____	○8
b) Are smart water heaters, that is, they can be controlled over the internet via a smart phone or computer?	_____	○8
c) Have a hot water heater tank wrap, that is, have insulation overtop of the metal exterior of the tank?	_____	○8

9d. **[DO NOT POSE IF Q9A=TOTAL ENTERED IN Q8]** Of this/these remaining **[INSERT NUMBER Q8 TOTAL MINUS Q9A TOTAL]** hot water heaters, how many are heat pump water heaters?

RECORD NUMBER:_____

98 Don't know/Not sure



Section D: HVAC & Refrigeration

Thinking about your building for your business' Nova Scotia location where you work …

10. Does your building … **ALLOW ONE RESPONSE FOR EACH – ROTATE ORDER**

	Yes	*No*	*Don't know*	*Not Applicable*
a) Have open coolers, that is, coolers that do not have covers or doors?	○1	○2	○8	○9
b) Have strategic energy management or organized management approach? This is the process of monitoring, controlling, and conserving energy within and organization in a systematic way..	○1	○2	○8	○9
c) Have Door heater controls such as anti-sweat heaters (ASH)? These are electric resistance heaters that are installed in the frames and doors of refrigerated cases to reduce condensation and prevent fogging. These are particularly common in grocery and convenience stores.	○1	○2	○8	○9
d) Have a packaged terminal heat pump (PTHP)? A PTHP provides heating and cooling room by room often for applications common in hotels and motels.	○1	○2	○8	○9
e) In your heating, cooling and ventilation systems, is the speed of any fans or pumps automatically controlled by a variable frequency drive (VFD)?	○1	○2	○8	○9

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11. **[ONLY DISPLAY ITEMS RESPONDENT ANSWERED 'YES' TO IN Q10]** How many of each does your business have? **ROTATE ORDER**

	RECORD NUMBER	*Don't know*
a) Open coolers, that is, coolers that do not have covers or doors?	_____	○8
b) Door heater controls such as anti-sweat heaters (ASH)? These are electric resistance heaters that are installed in the frames and doors of refrigerated cases to reduce condensation and prevent fogging. These are particularly common in grocery and convenience stores.	_____	○8
c) Packaged terminal heat pumps (PTHP)? A PTHP provides heating and cooling room by room often for applications common in hotels and motels.	_____	○8
d) Systems with variable frequency drive (VFD)? In your heating, cooling and ventilation systems, VFD automatically controls the speed of any fans or pumps.	_____	○8

13. Approximately, how many motors does your business' HVAC, refrigeration equipment or appliances have?

RECORD NUMBER:_____
98 Don't know/Not sure

14. **[POSE IF 1 OR MORE IN Q.13]** Of this/these motors, how many of your HVAC, refrigeration equipment, or appliances use EC Motors? *EC Motors refer to an electronically commutated motor that uses electronic controls to vary its speed. They may be known as brushless DC motors.* **[ALLOW NUMBER EQUAL TO OR LESS THAN WHAT WAS ENTERED IN Q.13]**

RECORD NUMBER:_____
98 Don't know/Not sure

Section F: Lighting

Now thinking about lighting…

15. Please walk around your business' location and count all light bulbs, including those in closets, and parking garages. Next please indicate how many…

	Number of LED Bulbs	***Number of Non-LED Bulbs***	***Don't know***
f) Parking garage lights (Please count these lights separately from the other categories listed below)	___	___	○8
a) Linear lighting (e.g. fluorescent or LED tubes)	___	___	○8
b) *Pole mounted area lights which is exterior lighting generally used to provide illumination to areas for vehicle and pedestrian use, with light fixtures mounted to poles*	___	___	○8
c) Track/Mono-point direction lights, which is a lighting system in which the lights are fitted on tracks, allowing variable positioning	___	___	○8
d) Downlight luminaire which is a small spotlight set in a ceiling and directed downwards	___	___	○8
f) Flood lights, which are outdoor fixture mounted on a building, structure, or ground. They are typically used to illuminate or highlight outdoor objects and features).	____	___	○8
e) General service lights (i.e. have a base sized like a normal light bulb and screw into regular light sockets)	___	___	○8

16. **[SHOW ITEMS FROM Q.15 WHERE 1 OR MORE LEDS ARE ENTERED]** Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)? Smart LED light lightbulbs allow users to control the lights colour and brightness, among other functions, via the internet or a central control system such as an Energy Management System. **RECORD NUMBER FOR EACH – EACH NUMBER ENTERED CANNOT EXCEED CORRESPONDING NUMBER ENTERED IN Q.15 PROMPT RESPONDENT WITH NUMBER OF LIGHTS ENTERED PREVIOUSLY**

	Number of Smart LED Bulbs	***Don't know***
a) Linear lighting (i.e., Tube lamps)	___	○8
b) *Pole mounted area lights which is exterior lighting generally used to provide illumination to areas for vehicle and pedestrian use, with light fixtures mounted to poles*	___	○8
c) Track/Mono-point direction lights, which is a lighting system in which the lights are fitted on tracks, allowing variable positioning	___	○8
d) Downlight luminaire which is a small spotlight set in a ceiling and directed downwards	___	○8
e) Flood lights, which are outdoor fixture mounted on a building, structure, or ground. They are typically used to illuminate or highlight outdoor objects and features).	___	○8
f) General service lights (i.e. have a base sized like a normal light bulb and screw into regular light sockets)	___	○8
g) Parking garage lights	___	○8

17. Approximately, how many occupancy sensors does your business' building/facility have? Occupancy sensors are motion detectors that will turn off lights when people are not present. **RECORD NUMBER_____**

98 Don't know/Not sure

18. How many rooms in your business' Nova Scotia location where you work have lighting fixtures that automatically turn off if there is sufficient sunlight coming into the building (i.e., daylighting controls)?
RECORD NUMBER_____

98 Don't know/Not sure

19. Were any of your lighting systems commissioned? Lighting Commissioning involves a professional installing, calibrating and testing the lighting system controls to ensure they operate correctly.

1 Yes
2 No
8 Don't know/Not sure

Section G: Willingness and Awareness

RANDOMIZE ORDER FOR 20-23 & 21-22
Moving on…
20. Before today, how familiar were you with: **ROTATE LIST – ALLOW ONE RESPONSE PER ITEM**
RANDOMLY POSE ONLY ONE OF THESE ITEMS

	0- Completely Unfamiliar	1	2	3	4	5	6	7	8	9	10 – Completely familiar
a. IT load optimization strategy (Server refresh and virtualization) (A *way of reducing the number of physical computer servers by running multiple, independent operating systems on a single server*)											
b. Heat pump water heater											
c. Open to closed cooler conversion (*doors or covers on coolers)*											
d. Door heater control (*These are electric resistance heaters that are installed in the frames and doors of refrigerated cases to reduce condensation and prevent fogging.*)											

e. Packaged Terminal heat pump (*A PTHP provides heating and cooling room by room often for applications such as hotels, motels, apartment buildings, offices, among others)*											
f. EC Motor for Refrigeration applications (*An electronically commutated motor (EC Motor) is a motor that uses electronic controls to vary its speed. There are three types of EC motors: constant cfm, constant rpm, and constant torque*)											
g. Strategic energy management program (*This involves processes that empower an organization to implement energy management actions and consistently achieve energy performance improvements)*											

23. Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) **[INSERT RANDOM SELECTION OF ITEM FROM Q20].** Would you generally pursue an energy efficiency project where the cost to you after utility rebates is **$100,000** if the project saved $[**INSERT RANDOM AMOUNT FROM TABLE BELOW**] per year?

IF 'YES,' DECREASE AND ASK UNTIL 'NO' OR NONE REMAINING. IF 'NO,' INCREASE AND ASK UNTIL 'YES,' OR NONE REMAINING

	Yes	*No*	*Don't know*
a) $5,000	O1	O2	O8
b) $20,000	O1	O2	O8
c) $35,000	O1	O2	O8
d) $50,000	O1	O2	O8
e) $65,000	O1	O2	O8
f) $80,000	O1	O2	O8
g) $95,000	O1	O2	O8
h) $110,000	O1	O2	O8
i) $125,000	O1	O2	O8

21. Before today, how familiar were you with: **ROTATE LIST – ALLOW ONE RESPONSE PER ITEM RANDOMLY POSE ONLY ONE OF THESE ITEMS**

	0- Completely Unfamiliar	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 – Completely familiar**
a. Networked/Connected Lighting System											
b. LED linear replacement lamp (i.e., LED Tube lamps)											
c. Smart power bar (*power bar that can be controlled via smart phone or computer or turn off automatically when you leave the room*)											
d. LED Pole/Arm-mounted luminaire (E*xterior lighting generally used to provide illumination to areas for vehicle and pedestrian use, with light fixtures mounted to poles)*											
e. LED Parking garage light											
f. Daylight dimming control											
g. LED Track light (*A lighting system in which the lights are fitted on tracks, allowing variable positioning)*											

h. Solid State (LED) Recessed Downlight (*Small spotlight set in a ceiling and directed downwards*)											
i. LED Flood light (*which are downward lights with non-LED bulbs*)											
j. General service light (*have a base sized like a normal light bulb and screw into regular light sockets*)											

22. Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) **[INSERT RANDOM SELECTION OF ITEM FROM Q.21]** Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is **$7,500** if the project saved $[**INSERT RANDOM AMOUNT FROM TABLE BELOW**] per year?

IF 'YES,' DECREASE AND ASK UNTIL 'NO' OR NONE REMAINING. IF 'NO,' INCREASE AND ASK UNTIL 'YES,' OR NONE REMAINING

	Yes	*No*	*Don't know*
a) $500	O1	O2	O8
b) $2,000	O1	O2	O8
c) $3,500	O1	O2	O8
d) $5,000	O1	O2	O8
e) $6,500	O1	O2	O8
f) $8,000	O1	O2	O8
g) $9,500	O1	O2	O8

Section E: Demographics/Characteristics

And now, some questions to help us classify our results. Please remember that all information is confidential and anonymous – this information will not be identified in any way with your responses.

24. How many full-time equivalent employees, including yourself, are currently working at your business location within Nova Scotia?

RECORD NUMBER_____

98 Don't know/Not sure

25. Approximately, what is the square footage of your company's business property at the location where you work? Would you say…? **ALLOW ONE RESPONSE**

1 1,000 square feet or less
2 More than 1,000 square feet up to 2,000 square feet
3 More than 2,000 square feet up to 5,000 square feet
4 More than 5,000 square feet, up to 10,000 square feet
5 More than 10,000 square feet, up to 25,000 square feet, or is it
6 More than 25,000 square feet
98 Don't know/Not sure

26. Does your company pay for its own electricity at your business' Nova Scotia location where you work, or does someone else, such as a landlord pay for it? **ALLOW ONE RESPONSE**

1 Yes, pay for own
2 Head office or other department pays
3 No, landlord pays
98 Don't know/Not sure
99 Other (Please specify:_____)

26a. **[POSE IF CODES 1 OR 2 IN Q.26]** Please select the electric utility provider that provides electricity at your business' Nova Scotia location where you work. **ALLOW ONE RESPONSE**

1 Nova Scotia Power Incorporated
2 Antigonish Electric Utility
3 Berwick Electric Light Commission
4 Canso Electric Light Commission
5 Lunenburg Electric Utility
6 Mahone Bay Electric Utility
7 Riverport Electric Light Commission
98 Don't know/Not sure

27. **[POSE IF CODE 1 IN Q.26a]** Please select your business' rate code from the drop-down selection below. Your rate code can be found on your Nova Scotia Power bill. **INSERT IMAGE OF POWER BILL; ALLOW ONE RESPONSE**

1	2
2	3
3	4M
4	4B
5	5
6	6
7	10M
8	10B
9	11M
10	11B
11	11MTO
12	12M
13	12MTO
14	21M
15	21MTO
16	22M
17	22MTO
18	23M
19	23MTO
20	25M
21	25MTO
22	999
98	Don't know/Not sure

27.2 **[POSE IF CODES 2-7 IN Q26a]** Please select your business' rate code from the drop-down selection below. Your rate code can be commonly found on your electricity bill. **ALLOW ONE RESPONSE**

1	Residential	
2	General	
3	General, Transformer owned	**ONLY SHOW IF CODE 4**
4	Small General	**DO NOT SHOW IF CODE 2**
5	Large General	**DO NOT SHOW IF CODE 3, 4, 6**
6	Small Industrial	**ONLY SHOW IF CODE 4**
7	Small Industrial, Cust-owned Transf	**ONLY POSE IF CODE 4**
8	Industrial	**DO NOT SHOW IF CODE 2, 5, 6, OR 7**
9	Industrial, Cust-owned Transf	**ONLY POSE IF CODE 4**
98	Don't know/Not sure	

28. **[ASK IF 98 IN Q 27]** Approximately, how much does your business spend on electricity each month?

RECORD NUMBER _____

98 Don't Know/Not sure

29. **[ASK IF 98 IN Q 28]** Would you classify your business as….

1 Large business
2 Small business
3 Large commercial
4 Small Commercial
5 Industrial
6 Institutional
98 Don't know/Not sure

30. What is the main source of energy used to heat your business' Nova Scotia location where you work? **RANDOMIZE PRESENTATION, KEEPING "OTHER" AND "DON'T KNOW" LAST – CODE ONE ONLY**

1 Oil
2 Electricity
3 Heat pump/Mini-split heat pump
4 Wood/pellets/chips
5 Propane
6 Natural gas
7 Solar
98 Don't know/Not sure
99 Other (Please specify:_____)

31. **[DO NOT POSE IF "DON'T KNOW/NOT SURE" IN Q.30]** What other types of heating, if any, do you currently have for your business' Nova Scotia location where you work? Please select all that apply. **PRESENT IN SAME ORDER AS Q.30 –ALLOW MULTIPLE RESPONSES – DO NOT DISPLAY ANY ITEMS ALREADY SELECTED IN Q30**

1 Oil
2 Electricity
3 Heat pump/Mini-split heat pump
4 Wood/pellets/chips
5 Propane
6 Natural gas
7 Solar
99 Other (Please specify: _____)
97 None – no other type of heating is used
98 Don't know/Not sure

32. **[POSE IF 'ELECTRICITY' IN Q 30 OR 31]** What type of electric heating does your business' location use? **CODE ONE ONLY**

1 Electric Baseboards (e.g., small electric heaters, places throughout your building, typically under windows)
2 Electric resistance Furnace (i.e., a central furnace which uses an electric heating element and distributes heat through forced-air)
3 Electric resistance Boiler (i.e., a central furnace which uses an electric heating element and distributes heat through hot water, to your floor or radiators)
4 Central Air-Source Heat Pump (i.e., a central heat pump system that heats all or most of the building, through distributed hot water or hot air)
5 Ductless/Mini-Split Heat Pump (i.e., a heat pump system that has an indoor unit placed on a wall, that typically only heats a small area of the building)
6 Ground-Source Heat Pump (i.e., a central heat pump that collects heat from tubes in the ground outside of your building)
7 Other (Please Specify:_____)
98 Don't Know/Not Sure

33. In what specific business sector or industry is your organization currently involved as its primary activity? **ALLOW ONE RESPONSE**

1 Agriculture, forestry, fishing and hunting
2 Mining, quarrying, and oil and gas extraction
3 Utilities
4 Construction
5 Manufacturing
6 Wholesale trade
7 Retail trade
8 Transportation and warehousing
9 Information and cultural industries
10 Finance and insurance
11 Real estate and rental and leasing
12 Professional, scientific and technical services **(SPECIFY:_____)**
13 Management of companies and enterprises
14 Administrative and support, waste management and remediation services
15 Educational services
16 Health care and social assistance
17 Arts, entertainment and recreation
18 Accommodation and food services
19 Other services (except public administration)
20 Public administration
98 Don't know/Not sure
99 Other **(SPECIFY: _____)**

That concludes the survey. Thank you for your assistance and cooperation. It is greatly appreciated!

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2019 Electricity Usage Surveys - Residential

TABLE 1:

To begin…Do you reside in…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Halifax Regional Municipality (HRM)	43	100	0	0	44	43	53	45	36	29	48	38	55	38	45	39	42	44	48	42	55	41	34	22
Elsewhere on Mainland Nova Scotia outside HRM	42	0	0	100	42	42	35	41	47	53	38	45	37	43	43	49	44	40	36	44	36	45	50	49
Cape Breton Island	14	0	100	0	14	15	12	13	17	18	14	17	9	20	13	12	13	15	16	14	9	14	16	29
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

TABLE 3:

Are you...?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Male	48	48	47	48	100	0	49	48	47	46	50	48	47	47	48	48	52	44	57	45	48	54	45	49
Female	52	52	53	52	0	100	50	52	53	53	50	52	52	53	52	52	48	55	42	55	52	46	55	51
Gender diverse	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Prefer not to answer	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

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2019 Electricity Usage Surveys - Residential

TABLE 4:

Are you:

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
18-24	9	12	3	9	10	9	39	0	0	14	8	5	18	7	11	6	8	11	12	9	10	1	1	6
25-34	15	17	17	11	15	14	61	0	0	18	14	10	23	11	16	11	13	16	15	15	12	14	6	9
35-44	14	16	13	13	14	14	0	44	0	15	15	14	14	13	15	14	14	14	15	14	16	15	12	10
45-54	18	18	17	18	18	18	0	56	0	15	20	19	16	19	20	17	19	17	15	19	23	25	14	17
55-64	19	17	21	21	19	19	0	0	44	18	19	22	13	24	17	20	20	18	22	18	16	23	21	30
65 or older	24	19	28	28	23	25	0	0	56	22	24	28	15	26	21	31	25	23	21	25	22	22	47	28
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

TABLE 5:

Do you currently own or rent your primary place of residence in Nova Scotia?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Own (even if it is still being paid for)	67	59	80	71	68	67	43	69	79	54	74	100	0	75	66	85	71	64	73	66	100	100	100	100
Rent (even if no cash rent is paid)	33	41	20	29	32	33	57	31	21	46	26	0	100	25	34	15	29	36	27	34	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

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2019 Electricity Usage Surveys - Residential

TABLE 6:

Which one of the following best describes your primary place of residence in Nova Scotia?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Single family detached house	64	50	79	72	66	62	47	65	72	53	69	83	23	77	61	75	69	59	67	63	71	83	87	93
Condominium, apartment or other multi-family dwelling with three or more units	19	31	4	13	18	21	30	16	16	25	18	4	52	9	19	10	16	22	14	21	10	3	1	0
Single family attached house such as a duplex, townhouse, or row house	9	13	6	5	9	9	13	10	6	10	8	7	13	8	11	8	8	10	12	8	9	9	7	4
Mobile home or trailer	4	2	4	5	3	5	3	5	3	7	3	4	2	3	4	5	3	4	4	4	8	5	4	1
Multi-family dwelling with two units	3	2	7	3	4	3	6	3	2	4	3	1	7	2	4	2	2	4	2	3	2	1	1	2
Other	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	0	1	0	1	1	0	0	0	1
Don't know/Not sure	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

TABLE 7:

How many electric clothes dryers do you have in your home?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	8	10	6	8	8	8	10	8	8	13	6	3	19	6	8	3	6	11	5	9	1	2	3	7
1	87	82	92	90	87	87	81	88	90	79	91	95	71	91	87	94	90	85	90	86	96	96	96	92
2 or more	3	6	1	2	4	3	7	3	2	7	2	2	7	3	4	3	4	3	5	3	3	2	0	1
Don't know	1	2	1	0	1	1	2	1	0	1	1	0	3	0	1	1	0	1	0	1	0	0	1	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	1.0	1.1	1.0	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Responses of 'Don't know' were excluded from calculation of the mean.

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2019 Electricity Usage Surveys - Residential

TABLE 8:

[IF Q7 '1' OR MORE] Of this/these [Q7 RESPONSE] clothes dryer(s), how many are heat pump dryers?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	67	68	63	68	65	69	43	67	80	60	71	73	54	70	65	69	72	63	67	67	62	77	80	73
1	13	13	16	12	17	9	31	10	5	20	12	11	19	11	15	14	14	12	25	10	14	9	7	10
2 or more	1	2	0	0	1	1	3	0	0	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Don't know	19	17	21	20	16	21	23	22	14	18	17	16	25	18	18	17	13	24	7	22	22	13	13	16
WEIGHTED SAMPLE SIZE (#)	**907**	**382**	**136**	**389**	**434**	**471**	**214**	**296**	**398**	**224**	**592**	**649**	**258**	**396**	**522**	**249**	**426**	**481**	**209**	**698**	**165**	**166**	**137**	**145**
UNWEIGHTED SAMPLE SIZE (#)	**907**	**409**	**127**	**371**	**407**	**498**	**175**	**303**	**429**	**208**	**607**	**659**	**248**	**403**	**523**	**258**	**429**	**478**	**206**	**701**	**166**	**167**	**145**	**143**
MEAN	.2	.2	.2	.1	.2	.1	.5	.1	.1	.3	.2	.1	.3	.2	.2	.2	.2	.2	.3	.1	.2	.1	.1	.2

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 7+8 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q7. How many electric clothes dryers do you have in your home?
Q8. [IF Q7 '1' OR MORE] Of this/these [Q7 RESPONSE] clothes dryer(s), how many are heat pump dryers?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Proportion heat pump dryers	17	18	20	15	21	13	43	12	7	24	15	14	24	15	20	18	17	17	28	13	20	12	8	14
WEIGHTED SAMPLE SIZE (#)	**737**	**319**	**108**	**311**	**363**	**374**	**165**	**229**	**342**	**183**	**491**	**545**	**192**	**323**	**427**	**208**	**370**	**367**	**194**	**543**	**129**	**144**	**119**	**122**
UNWEIGHTED SAMPLE SIZE (#)	**734**	**338**	**101**	**295**	**345**	**388**	**132**	**233**	**369**	**167**	**502**	**552**	**182**	**326**	**424**	**218**	**374**	**360**	**191**	**543**	**130**	**145**	**127**	**120**

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TABLE 9 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q7 '1' OR MORE] Of this/these [Q7 RESPONSE] clothes dryer(s), how many are…

		REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
	OVERALL %	HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Less than 5 years old	29	28	29	29	32	26	39	31	22	25	31	27	33	25	31	34	31	26	32	28	38	24	18	24
At least 5 years but less than 10 years old	44	46	45	42	44	44	43	47	42	50	42	43	48	43	46	40	41	47	42	45	37	45	47	44
10 years or older	27	26	26	29	24	30	18	22	36	26	27	30	19	31	22	26	28	26	26	27	25	31	35	32
WEIGHTED SAMPLE SIZE (#)	**831**	**342**	**130**	**359**	**403**	**425**	**174**	**279**	**378**	**200**	**554**	**626**	**204**	**377**	**478**	**232**	**396**	**434**	**199**	**632**	**163**	**160**	**134**	**139**
UNWEIGHTED SAMPLE SIZE (#)	**836**	**369**	**122**	**345**	**385**	**449**	**141**	**287**	**408**	**189**	**567**	**639**	**197**	**384**	**484**	**243**	**403**	**433**	**197**	**639**	**164**	**163**	**143**	**137**

This table excludes responses of 'Don't know'.

TABLE 10:

How many clothes washers do you have in your home?

		REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
	OVERALL %	HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	7	9	2	5	6	7	8	7	5	12	4	1	18	3	7	1	4	9	4	7	1	2	1	0
1	89	84	98	91	89	89	85	88	92	79	93	97	73	93	88	96	92	86	93	88	96	96	98	98
2 or more	4	6	0	3	4	4	6	3	3	8	2	2	8	4	5	3	4	4	3	4	2	2	1	2
Don't know	1	1	0	0	0	1	1	1	0	0	1	0	2	0	1	0	0	1	0	1	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 11 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q10 '1' OR MORE] Of this/these [Q10 RESPONSE] clothes washer(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Top-loading with an agitator in the tub	60	56	62	63	55	63	60	60	60	72	55	55	69	61	57	53	57	62	54	61	34	64	59	65
Front loading	27	33	23	21	29	25	27	26	26	16	31	30	20	22	30	32	28	25	31	25	48	24	26	22
Top loading without an agitator in the tub	14	11	14	16	16	12	13	14	14	11	14	15	11	17	13	15	15	13	15	13	18	12	15	13
WEIGHTED SAMPLE SIZE (#)	**917**	**384**	**140**	**393**	**438**	**477**	**214**	**296**	**408**	**224**	**603**	**663**	**254**	**405**	**525**	**251**	**436**	**481**	**211**	**706**	**164**	**165**	**141**	**154**
UNWEIGHTED SAMPLE SIZE (#)	**918**	**412**	**130**	**376**	**413**	**503**	**176**	**304**	**438**	**208**	**616**	**672**	**246**	**410**	**527**	**261**	**438**	**480**	**208**	**710**	**166**	**166**	**149**	**152**

This table excludes responses of 'Don't know'.

TABLE 12 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q10 '1' OR MORE] Of this/these [Q10 RESPONSE] clothes washer(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Less than 5 years old	35	33	37	37	39	31	49	34	29	29	37	34	38	32	38	39	39	32	42	33	45	31	23	32
At least 5 years but less than 10 years old	40	41	40	39	38	42	33	44	41	46	38	39	44	41	40	39	36	44	37	41	33	40	47	39
10 years or older	25	26	23	24	23	27	18	22	30	25	25	27	18	26	22	22	26	24	21	26	22	29	31	29
WEIGHTED SAMPLE SIZE (#)	**858**	**354**	**137**	**367**	**416**	**440**	**182**	**282**	**394**	**206**	**573**	**649**	**209**	**393**	**493**	**240**	**414**	**444**	**205**	**653**	**164**	**165**	**139**	**150**
UNWEIGHTED SAMPLE SIZE (#)	**862**	**382**	**127**	**353**	**398**	**462**	**149**	**289**	**424**	**194**	**582**	**659**	**203**	**398**	**496**	**251**	**418**	**444**	**202**	**660**	**165**	**166**	**148**	**147**

This table excludes responses of 'Don't know'.

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2019 Electricity Usage Surveys - Residential

TABLE 13a:

How many of the following do you have in your home…

Full-size refrigerators (Note: these do not include mini fridges or wine fridges)?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	1	1	0	1	1	1	0	1	0	1	0	0	1	1	0	0	0	1	0	1	0	1	0	0
1	85	85	90	84	84	86	86	89	82	86	85	84	88	84	87	83	87	84	87	85	81	83	84	84
2 or more	11	11	8	13	12	11	9	8	15	9	12	13	7	14	9	15	11	11	11	11	16	14	15	13
Don't know	3	3	2	3	3	3	4	2	3	4	2	2	4	2	3	1	2	4	2	3	3	3	1	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 14 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q13a '1' OR MORE] Of this/these [Q13a RESPONSE] full-size refrigerator(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Less than 5 years old	29	30	26	28	29	28	36	29	25	30	29	26	37	25	33	34	31	26	36	26	35	24	19	23
At least 5 years but less than 10 years old	42	40	47	42	46	39	46	40	42	44	42	42	41	41	43	41	42	42	40	43	35	44	45	46
10 years or older	29	30	26	30	26	33	18	31	33	26	28	32	22	34	24	25	27	31	25	31	30	33	36	31
WEIGHTED SAMPLE SIZE (#)	**881**	**379**	**136**	**366**	**422**	**457**	**188**	**292**	**400**	**221**	**576**	**634**	**247**	**387**	**509**	**242**	**415**	**466**	**214**	**667**	**160**	**156**	**140**	**145**
UNWEIGHTED SAMPLE SIZE (#)	**890**	**406**	**128**	**356**	**408**	**480**	**159**	**300**	**431**	**213**	**588**	**646**	**244**	**392**	**517**	**252**	**424**	**466**	**210**	**680**	**163**	**160**	**147**	**141**

This table excludes responses of 'Don't know'.

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TABLE 13b:

How many of the following do you have in your home…

Mini refrigerators or wine fridges?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	75	73	80	75	71	78	75	71	78	77	73	72	81	73	72	71	72	77	71	76	65	68	75	78
1	20	20	16	22	24	17	16	23	20	17	22	24	13	22	22	25	23	17	25	19	29	26	24	17
2 or more	2	3	3	1	2	3	3	4	1	2	3	2	3	2	3	3	2	3	2	3	3	2	1	3
Don't know	3	3	2	2	3	2	7	2	1	4	2	2	3	2	4	1	2	3	3	3	4	4	0	2
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.3	.3	.2	.3	.3	.3	.3	.3	.2	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.4

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 15 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q13b '1' OR MORE] Of this/these [Q13b RESPONSE] mini or wine refrigerator(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Less than 5 years old	42	44	40	40	43	39	50	50	29	50	40	40	47	38	46	49	41	42	41	42	49	29	32	49
At least 5 years but less than 10 years old	38	37	45	36	35	42	39	32	43	33	39	36	43	40	33	35	39	37	42	36	29	42	28	43
10 years or older	21	19	15	24	22	20	11	18	27	18	22	24	9	22	22	16	20	21	18	22	22	29	40	8
WEIGHTED SAMPLE SIZE (#)	**214**	**94**	**24**	**95**	**117**	**96**	**40**	**83**	**91**	**47**	**149**	**168**	**46**	**97**	**134**	**70**	**113**	**101**	**56**	**158**	**53**	**47**	**34**	**29**
UNWEIGHTED SAMPLE SIZE (#)	**220**	**102**	**25**	**93**	**120**	**99**	**34**	**86**	**100**	**42**	**157**	**175**	**45**	**98**	**136**	**76**	**112**	**108**	**58**	**162**	**56**	**49**	**35**	**29**

This table excludes responses of 'Don't know'.

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TABLE 13c:

How many of the following do you have in your home…

Stand-alone freezers, that is, freezers that are not attached to refrigerators?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	36	45	32	28	35	37	54	35	26	42	33	27	55	27	37	23	34	38	32	37	32	26	22	24
1	55	47	61	62	55	55	36	57	65	48	58	63	39	65	53	66	57	53	62	53	56	64	71	64
2 or more	6	4	5	8	6	6	2	7	7	5	6	8	2	6	6	10	7	5	4	7	8	8	7	10
Don't know	3	4	2	2	3	2	8	1	2	4	2	3	4	2	4	2	2	3	2	3	4	3	1	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.7	.6	.7	.8	.7	.7	.4	.7	.8	.6	.7	.8	.5	.8	.7	.9	.7	.7	.7	.7	.7	.8	.8	.9

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 16 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q13c '1' OR MORE] Of this/these [Q13a RESPONSE] stand-alone freezer(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Less than 5 years old	24	21	20	27	29	19	36	25	20	27	23	21	34	23	26	26	26	23	27	23	29	16	20	20
At least 5 years but less than 10 years old	33	32	39	32	29	37	40	32	32	36	32	32	37	31	33	35	32	34	38	31	31	37	32	29
10 years or older	43	47	41	41	42	44	24	43	49	37	45	47	29	46	41	38	43	43	35	46	40	48	48	51
WEIGHTED SAMPLE SIZE (#)	**596**	**219**	**90**	**287**	**286**	**308**	**88**	**201**	**307**	**136**	**401**	**465**	**131**	**291**	**335**	**189**	**285**	**311**	**141**	**455**	**105**	**119**	**109**	**112**
UNWEIGHTED SAMPLE SIZE (#)	**615**	**242**	**87**	**286**	**285**	**328**	**78**	**211**	**326**	**137**	**414**	**478**	**137**	**295**	**348**	**196**	**293**	**322**	**143**	**472**	**106**	**124**	**117**	**108**

This table excludes responses of 'Don't know'.

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TABLE 17:

How many power bars do you have in your home? A power bar is a block of electrical sockets that attaches to the end of a flexible cable allowing multiple electrical devices to be powered from a single electrical socket.

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	3	2	3	3	3	3	3	4	2	4	3	3	3	2	3	3	3	3	2	3	3	3	2	3
1	13	13	12	13	11	15	15	9	14	16	11	11	15	12	11	9	12	13	11	13	9	9	15	13
2	22	21	25	23	20	25	25	19	23	31	18	21	26	24	22	21	22	23	19	23	17	19	24	26
3	24	28	16	23	24	24	20	27	24	17	27	25	22	22	25	26	26	22	25	24	28	24	24	22
4	12	10	17	13	13	11	11	12	13	10	13	13	10	11	13	14	12	12	11	12	16	14	10	12
5 or more	20	22	19	19	24	17	22	21	19	18	23	21	20	23	22	20	21	20	26	19	18	22	21	21
Don't know	5	4	9	6	6	5	4	8	4	4	6	6	4	6	5	7	4	7	5	5	8	9	4	4
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	3.4	3.4	3.2	3.3	3.5	3.2	3.5	3.5	3.2	3.2	3.5	3.4	3.2	3.5	3.5	3.4	3.4	3.3	3.8	3.2	3.4	3.3	3.2	3.7

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 18:

[IF Q17 '1' OR MORE] Of this/these [Q17 RESPONSE] power bar(s), how many are smart power bars, that is, can be controlled via smart phone or computer or turn off automatically when you leave the room?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	86	85	87	86	83	88	86	81	89	83	87	86	86	87	82	85	84	87	82	87	81	84	92	86
1	5	6	3	4	6	4	6	8	3	5	5	5	4	4	6	5	6	4	6	5	7	7	3	4
2	3	3	0	3	3	3	3	3	2	4	2	2	4	2	4	4	3	2	3	3	3	3	1	2
3	2	2	1	3	4	1	2	2	2	2	2	2	3	1	3	1	3	1	4	2	3	1	1	2
4	1	0	2	0	0	1	0	1	1	2	0	0	1	0	1	1	1	0	1	0	0	1	0	1
5 or more	0	1	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	1	1	0	1
Don't know	4	4	6	3	3	4	3	4	4	4	4	4	3	4	4	3	2	5	2	4	4	4	4	4
WEIGHTED SAMPLE SIZE (#)	**919**	**407**	**128**	**384**	**435**	**481**	**225**	**287**	**408**	**241**	**586**	**612**	**308**	**391**	**529**	**231**	**423**	**497**	**205**	**714**	**148**	**149**	**134**	**146**
UNWEIGHTED SAMPLE SIZE (#)	**921**	**435**	**121**	**365**	**412**	**505**	**188**	**292**	**441**	**230**	**598**	**622**	**299**	**394**	**531**	**241**	**428**	**493**	**205**	**716**	**151**	**152**	**140**	**144**
MEAN	.2	.2	.2	.2	.3	.2	.2	.3	.2	.3	.2	.2	.2	.2	.3	.2	.3	.2	.4	.2	.3	.3	.1	.2

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 17+18 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

How many power bars do you have in your home? A power bar is a block of electrical sockets that attaches to the end of a flexible cable allowing multiple electrical devices to be powered from a single electrical socket.
[IF Q17 '1' OR MORE] Of this/these [Q17 RESPONSE] power bar(s), how many are smart power bars, that is, can be controlled via smart phone or computer or turn off automatically when you leave the room?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Proportion smart power bars	6	7	6	6	8	5	6	7	6	10	5	6	7	5	8	6	8	5	9	5	8	7	2	6
WEIGHTED SAMPLE SIZE (#)	**886**	**392**	**120**	**374**	**422**	**460**	**218**	**274**	**393**	**232**	**564**	**587**	**299**	**375**	**507**	**223**	**414**	**472**	**200**	**685**	**142**	**143**	**129**	**140**
UNWEIGHTED SAMPLE SIZE (#)	**885**	**417**	**114**	**354**	**398**	**483**	**182**	**278**	**425**	**222**	**574**	**595**	**290**	**376**	**507**	**232**	**418**	**467**	**199**	**686**	**144**	**145**	**135**	**138**

TABLE 19:

How many hot water heaters do you have in your home?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	17	24	18	9	18	15	15	15	19	19	17	11	28	18	11	10	16	18	17	17	11	10	16	9
1	74	64	78	84	74	75	63	78	77	70	76	84	54	75	79	85	78	71	76	74	80	87	83	87
2 or more	3	3	1	3	5	1	7	2	2	5	3	3	3	3	4	3	4	2	6	2	6	3	1	1
Don't know	6	9	2	4	3	9	14	6	2	6	5	2	15	5	6	2	3	9	2	7	3	1	0	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.9	.8	.8	.9	.9	.9	.9	.9	.8	.9	.9	.9	.7	.8	.9	.9	.9	.8	.9	.8	1.0	.9	.8	.9

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 20 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q19 '1' OR MORE] Of this/these [Q19 RESPONSE] hot water heater(s), how many...

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Have a hot water heater tank wrap	46	44	46	47	50	41	45	41	49	46	46	46	43	42	49	55	44	47	51	43	43	50	46	47
Have a large duct for exhaust gas	29	39	23	23	29	29	55	25	22	28	31	26	43	31	30	22	30	28	32	28	34	24	21	21
Are smart water heaters	3	3	2	2	2	3	5	4	1	4	2	1	9	3	3	3	3	3	3	2	1	0	2	0
Are heat pump water heaters	0	0	2	0	1	0	2	0	0	2	0	0	2	1	0	0	1	0	1	0	0	0	1	0
WEIGHTED SAMPLE SIZE (#)	**535**	**196**	**85**	**254**	**295**	**239**	**92**	**176**	**266**	**130**	**361**	**431**	**104**	**222**	**338**	**183**	**271**	**264**	**144**	**391**	**101**	**114**	**98**	**97**
UNWEIGHTED SAMPLE SIZE (#)	**533**	**212**	**79**	**242**	**284**	**248**	**68**	**178**	**287**	**124**	**360**	**433**	**100**	**221**	**342**	**185**	**274**	**259**	**137**	**396**	**100**	**115**	**101**	**97**

This table excludes responses of 'Don't know'.

TABLE 21 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q19 '1' OR MORE] Of this/these [Q19 RESPONSE] hot water heater(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Less than 5 years old	39	37	40	40	40	37	44	41	34	44	38	39	39	35	43	41	40	37	41	38	44	40	32	37
At least 5 years but less than 10 years old	38	41	42	35	39	37	33	38	40	35	39	37	40	41	37	35	37	39	41	37	33	39	37	40
10 years or older	23	23	18	25	21	25	23	20	26	21	24	24	20	24	20	24	22	24	18	25	23	21	31	23
WEIGHTED SAMPLE SIZE (#)	**711**	**267**	**109**	**334**	**346**	**363**	**139**	**242**	**330**	**175**	**467**	**564**	**147**	**312**	**432**	**221**	**339**	**372**	**170**	**541**	**141**	**145**	**116**	**132**
UNWEIGHTED SAMPLE SIZE (#)	**712**	**282**	**102**	**328**	**327**	**383**	**113**	**248**	**351**	**167**	**472**	**568**	**144**	**314**	**439**	**226**	**340**	**372**	**165**	**547**	**139**	**147**	**122**	**130**

This table excludes responses of 'Don't know'.

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2019 Electricity Usage Surveys - Residential

TABLE 22:

How many shower heads do you have in your home?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	1	0	1	2	1	2	1	1	2	2	1	1	2	2	1	0	1	2	0	2	1	1	0	3
1	63	53	71	70	61	64	67	62	61	75	57	57	75	66	60	50	60	65	56	65	28	53	72	72
2	29	37	24	22	29	28	22	30	32	18	33	33	21	26	30	38	33	26	37	26	48	40	23	23
3 or more	6	10	2	4	8	5	8	7	5	2	9	8	2	6	8	11	6	6	6	6	22	5	5	2
Don't know	1	1	1	1	1	0	2	0	0	1	0	1	1	0	1	1	1	1	0	1	2	1	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	1.4	1.6	1.3	1.3	1.5	1.4	1.4	1.4	1.4	1.2	1.5	1.5	1.2	1.4	1.5	1.6	1.5	1.4	1.5	1.4	2.0	1.5	1.3	1.2

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 23:

[IF Q22 '1' OR MORE] Of this/these [Q22 RESPONSE] shower head(s), how many are low-flow, that is, they use less water to reduce your water usage?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	26	25	24	29	27	26	41	23	21	27	26	24	31	30	24	22	24	28	23	27	24	22	24	27
1	40	34	47	43	40	40	23	44	46	48	37	42	35	41	41	41	44	37	42	39	27	41	50	51
2	15	19	13	12	17	14	9	15	20	10	17	18	10	14	16	21	19	13	27	12	27	23	12	11
3 or more	2	3	2	2	3	2	2	3	2	0	4	3	0	1	3	5	2	2	2	2	9	3	1	0
Don't know	16	19	15	14	14	18	24	16	12	15	16	13	23	14	16	11	12	20	6	19	12	11	13	10
WEIGHTED SAMPLE SIZE (#)	**981**	**431**	**141**	**410**	**469**	**508**	**236**	**322**	**423**	**251**	**630**	**659**	**322**	**413**	**559**	**256**	**448**	**534**	**220**	**762**	**163**	**166**	**141**	**150**
UNWEIGHTED SAMPLE SIZE (#)	**982**	**459**	**132**	**391**	**444**	**534**	**197**	**330**	**455**	**237**	**642**	**668**	**314**	**419**	**561**	**266**	**452**	**530**	**217**	**765**	**166**	**168**	**149**	**147**
MEAN	.9	1.0	.9	.8	.9	.9	.6	1.0	1.0	.8	1.0	1.0	.7	.8	1.0	1.1	1.0	.9	1.1	.9	1.2	1.1	.9	.8

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 22+23 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q22. How many shower heads do you have in your home?
Q23. [IF Q22 '1' OR MORE] Of this/these [Q22 RESPONSE] shower head(s), how many are low-flow, that is, they use less water to reduce your water usage?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Proportion low-flow	64	63	70	64	64	65	44	67	72	64	64	67	58	61	65	68	68	61	71	62	63	70	68	66
WEIGHTED SAMPLE SIZE (#)	**822**	**351**	**119**	**352**	**403**	**416**	**179**	**270**	**373**	**214**	**528**	**575**	**247**	**355**	**470**	**229**	**394**	**428**	**207**	**615**	**144**	**147**	**123**	**135**
UNWEIGHTED SAMPLE SIZE (#)	**828**	**378**	**113**	**337**	**387**	**438**	**148**	**277**	**403**	**202**	**540**	**584**	**244**	**360**	**475**	**236**	**402**	**426**	**203**	**625**	**146**	**151**	**128**	**133**

TABLE 24:

How many water faucets do you have in your home?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	2	3	1	3	1	4	1	1	4	1	2	2	1	2	1	2	1	2	2	4	1	2	0
2	25	22	27	27	25	24	39	26	16	36	20	16	42	23	24	14	24	25	19	26	10	14	17	18
3	30	28	29	33	31	30	25	29	34	36	27	29	33	29	28	30	29	32	33	30	20	30	34	35
4	23	24	26	22	20	26	17	24	26	14	28	27	15	29	23	30	23	23	27	22	26	26	30	28
5 or more	19	22	15	16	20	18	12	18	23	7	23	25	6	18	21	24	22	16	18	19	38	28	17	17
Don't know	1	2	0	1	1	1	3	1	0	1	1	1	2	0	1	1	1	2	1	1	2	0	0	1
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	3.5	3.6	3.4	3.4	3.5	3.5	3.0	3.4	3.8	2.9	3.7	3.8	2.9	3.5	3.5	3.8	3.5	3.4	3.6	3.4	4.1	3.8	3.5	3.7

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 25:

[IF Q24 '1' OR MORE] Of this/these [Q24 RESPONSE] faucet(s), how many have low-flow faucet aerators? Faucet aerators attach to the tip of the faucets to prevent splashing, conserve water, and reduce energy costs.

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	40	38	37	43	37	43	48	38	37	45	39	38	45	41	40	35	37	42	39	40	38	33	42	37
1	14	13	14	15	15	13	15	13	15	16	14	15	12	15	14	14	15	14	12	15	11	14	17	19
2	13	13	14	13	16	11	6	15	15	15	13	14	11	14	13	12	17	10	17	12	10	12	13	21
3	9	9	9	9	9	9	5	10	10	8	8	9	8	9	9	12	11	6	9	8	11	14	9	4
4	5	5	7	4	5	5	3	4	7	2	6	6	2	5	5	6	6	4	10	3	6	7	8	6
5 or more	3	4	1	2	5	1	1	3	3	0	4	4	0	3	3	4	4	1	5	2	6	5	3	2
Don't know	16	17	17	15	14	18	21	17	13	14	16	13	22	13	17	17	9	22	7	19	18	14	9	10
WEIGHTED SAMPLE SIZE (#)	**987**	**426**	**145**	**417**	**472**	**512**	**235**	**319**	**433**	**256**	**633**	**666**	**321**	**421**	**564**	**255**	**451**	**537**	**218**	**769**	**164**	**168**	**142**	**154**
UNWEIGHTED SAMPLE SIZE (#)	**987**	**455**	**135**	**397**	**446**	**538**	**195**	**326**	**466**	**240**	**645**	**675**	**312**	**426**	**565**	**264**	**454**	**533**	**216**	**771**	**166**	**169**	**150**	**151**
MEAN	1.2	1.3	1.3	1.1	1.4	1.0	.8	1.3	1.4	.9	1.3	1.4	.9	1.2	1.2	1.5	1.4	1.0	1.6	1.1	1.5	1.6	1.3	1.2

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 24+25 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q24. How many water faucets do you have in your home?
Q25. [IF Q24 '1' OR MORE] Of this/these [Q24 RESPONSE] faucet(s), how many have low-flow faucet aerators? Faucet aerators attach to the tip of the faucets to prevent splashing, conserve water, and reduce energy costs.

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Proportion low-flow	35	36	37	33	40	30	26	37	37	32	35	36	30	35	33	39	40	29	44	31	36	42	35	33
WEIGHTED SAMPLE SIZE (#)	**822**	**348**	**121**	**353**	**405**	**415**	**185**	**264**	**373**	**220**	**526**	**572**	**250**	**366**	**464**	**210**	**406**	**416**	**204**	**618**	**133**	**144**	**127**	**138**
UNWEIGHTED SAMPLE SIZE (#)	**823**	**374**	**113**	**336**	**383**	**438**	**150**	**269**	**404**	**209**	**535**	**580**	**243**	**368**	**467**	**222**	**409**	**414**	**200**	**623**	**135**	**145**	**133**	**135**

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TABLE 26:

How many mini-split heat pumps do you have at your home? Please count only the exterior condensing units at your home. For example, if you have multiple indoor blowers connected to a single exterior unit, then this would be counted as one.

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	67	67	70	66	64	69	61	69	69	71	66	66	69	76	65	12	66	68	58	70	53	67	63	81
1	19	17	17	22	21	18	20	18	20	16	21	22	14	13	21	64	24	16	27	17	32	22	25	11
2	5	4	7	5	6	5	2	5	7	3	6	7	1	6	5	19	5	5	9	4	9	8	9	4
3 or more	1	1	1	0	1	0	1	1	0	0	1	1	0	0	1	2	1	0	2	0	3	0	0	1
Don't know	8	10	5	6	7	8	16	7	3	10	6	4	16	5	8	3	4	11	4	9	4	3	3	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.3	.3	.4	.4	.4	.3	.3	.3	.4	.3	.4	.4	.2	.3	.4	1.1	.4	.3	.5	.3	.6	.4	.4	.2

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 27:

How many thermostats does your home have to change the indoor temperature?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	3	2	2	5	3	3	4	4	2	5	2	3	3	2	3	1	4	2	5	2	1	3	4	3
1	36	39	37	33	33	39	37	34	37	47	31	29	51	48	23	24	36	37	35	37	18	20	31	47
2	17	15	24	16	18	16	19	14	18	19	17	16	19	24	14	16	17	17	16	17	11	8	26	23
3	9	9	8	9	11	8	12	6	10	7	10	10	7	13	9	12	9	9	11	9	12	10	11	7
4	6	6	4	7	6	6	3	9	6	4	7	6	6	5	7	7	7	6	6	7	13	7	1	4
5 or more	26	26	22	28	28	25	19	30	27	15	31	33	11	8	41	38	26	26	27	26	42	51	26	15
Don't know	2	3	2	2	2	3	6	2	1	2	2	2	4	1	3	2	1	3	1	3	3	1	1	1
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	3.4	3.4	3.1	3.4	3.5	3.2	2.7	3.6	3.5	2.5	3.8	3.9	2.2	2.1	4.5	4.3	3.4	3.3	3.6	3.3	4.6	5.4	3.4	2.5

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 28B:

[IF Q27 '1' OR MORE] Of this/these [Q27 RESPONSE] thermostat(s), how many are…

Programmable, that is, you can set schedules to control the temperature?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	56	52	62	57	52	59	56	53	58	68	52	51	66	52	55	39	52	59	47	58	41	62	47	54
1	22	23	25	19	22	21	19	21	24	17	23	24	18	28	19	27	25	19	24	21	21	12	33	32
2	8	9	6	7	9	7	9	8	7	8	8	8	7	9	8	12	9	7	13	6	9	7	8	10
3	3	3	2	4	5	1	5	2	2	1	4	4	1	3	4	5	5	1	4	3	4	6	3	2
4	2	3	1	1	2	2	0	3	1	0	2	3	0	2	2	3	2	2	2	2	7	3	1	1
5 or more	5	6	2	5	6	4	5	6	5	3	6	7	1	2	8	9	4	6	8	4	11	8	5	1
Don't know	5	5	2	6	4	6	5	6	3	3	3	4	8	4	4	5	2	7	3	5	7	3	4	1
WEIGHTED SAMPLE SIZE (#)	**948**	**416**	**139**	**394**	**455**	**490**	**218**	**307**	**424**	**243**	**616**	**641**	**307**	**411**	**541**	**248**	**429**	**519**	**208**	**740**	**161**	**161**	**136**	**150**
UNWEIGHTED SAMPLE SIZE (#)	**952**	**447**	**128**	**377**	**433**	**516**	**185**	**312**	**455**	**228**	**632**	**650**	**302**	**416**	**543**	**256**	**433**	**519**	**207**	**745**	**163**	**162**	**144**	**148**
MEAN	.9	1.0	.6	1.0	1.1	.8	.9	1.0	.9	.6	1.1	1.2	.5	.7	1.2	1.6	1.0	.9	1.3	.8	1.7	1.3	1.0	.7

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 28aa:

[IF Q28B '1' OR MORE] Of this/these [Q28B RESPONSE] programmable thermostat(s), how many are…

Smart thermostats you can control via a cell phone or the internet?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	82	76	83	89	83	81	76	79	87	76	83	83	77	85	77	79	80	84	77	84	75	83	89	89
1	10	13	10	5	13	6	17	9	6	15	8	8	13	7	13	10	13	6	15	8	11	10	6	6
2	4	5	3	3	1	7	5	6	2	8	4	4	5	4	5	5	4	4	6	4	7	1	2	1
3	1	1	0	1	0	1	1	1	0	1	1	0	2	0	1	1	1	0	0	1	1	0	0	0
4	0	1	0	0	1	0	0	1	1	0	1	1	0	0	0	1	0	1	1	0	1	1	0	0
5 or more	1	1	1	0	1	1	2	1	0	0	1	1	0	1	1	1	1	1	1	1	2	2	0	1
Don't know	2	3	2	2	1	4	0	2	4	1	3	3	2	2	3	3	1	4	1	3	3	3	2	3
WEIGHTED SAMPLE SIZE (#)	**373**	**178**	**50**	**144**	**200**	**172**	**83**	**124**	**165**	**71**	**272**	**290**	**83**	**178**	**219**	**140**	**195**	**177**	**104**	**268**	**85**	**58**	**67**	**68**
UNWEIGHTED SAMPLE SIZE (#)	**374**	**187**	**49**	**138**	**193**	**180**	**68**	**128**	**178**	**66**	**277**	**296**	**78**	**176**	**218**	**148**	**197**	**177**	**98**	**276**	**88**	**55**	**71**	**69**
MEAN	.3	.4	.2	.1	.3	.3	.4	.4	.1	.3	.3	.3	.3	.2	.3	.3	.3	.2	.4	.2	.4	.3	.1	.1

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 27+28B+28aa (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q27. How many thermostats does your home have to change the indoor temperature?
Q28B. [IF Q27 '1' OR MORE] Of this/these [Q27 RESPONSE] thermostat(s), how many are…
Q28aa. [IF Q28B '1' OR MORE] Of this/these [Q28B RESPONSE] programmable thermostat(s), how many are…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Proportion programmable	27	29	20	26	30	24	30	27	25	24	27	28	20	34	25	35	28	26	35	24	37	22	29	25
Proportion smart	3	5	3	1	3	3	5	4	1	4	3	3	4	5	3	4	4	3	5	2	5	2	2	2
WEIGHTED SAMPLE SIZE (#)	**893**	**390**	**135**	**368**	**437**	**454**	**206**	**284**	**403**	**236**	**587**	**611**	**282**	**389**	**512**	**231**	**416**	**477**	**201**	**692**	**148**	**156**	**129**	**147**
UNWEIGHTED SAMPLE SIZE (#)	**897**	**422**	**125**	**350**	**417**	**477**	**175**	**290**	**432**	**219**	**602**	**617**	**280**	**391**	**513**	**237**	**419**	**478**	**199**	**698**	**151**	**155**	**136**	**144**

TABLE 29A:

How many, if any, of the following does your home have?

Dehumidifier

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	51	54	43	50	50	51	55	51	48	60	48	42	68	42	51	45	47	54	44	53	49	42	28	46
1	41	40	48	41	42	41	35	41	45	32	45	50	24	49	41	47	45	39	48	39	43	51	63	46
2 or more	5	4	7	5	5	5	3	5	5	3	6	6	2	5	4	7	6	4	6	4	6	6	8	6
Don't know	3	3	2	4	4	3	6	3	2	5	2	2	6	3	3	2	3	3	2	4	2	2	1	2
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.5	.5	.6	.6	.5	.5	.5	.5	.6	.4	.6	.6	.3	.6	.5	.7	.6	.5	.6	.5	.6	.6	.8	.7

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 29B:

How many, if any, of the following does your home have?

Clothes line

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	42	51	45	32	44	41	50	41	38	42	43	33	60	35	43	37	36	47	38	43	53	33	22	24
1	53	44	49	63	51	54	45	53	57	49	53	61	36	59	52	59	59	47	56	52	44	64	71	67
2 or more	3	2	4	3	2	4	2	4	3	5	2	4	2	4	3	3	4	3	4	3	3	2	5	5
Don't know	2	3	2	2	3	1	3	2	2	4	2	2	3	2	3	2	2	2	2	2	1	2	1	4
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.6	.5	.6	.7	.6	.6	.5	.6	.7	.7	.6	.7	.4	.7	.6	.7	.7	.5	.7	.6	.5	.7	.8	.8

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 29C:

How many, if any, of the following does your home have?

Wood stove

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	74	84	75	64	71	77	74	77	73	75	75	67	89	78	73	71	70	78	71	75	78	61	60	69
1	23	12	22	34	26	20	21	21	24	21	22	30	8	20	23	26	27	19	25	22	19	36	37	26
2 or more	1	1	1	1	1	1	2	0	1	1	1	1	0	0	1	1	1	1	2	1	0	1	2	3
Don't know	2	3	2	1	2	2	4	1	2	3	2	2	3	2	3	2	2	2	2	2	3	2	1	2
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.3	.1	.2	.4	.3	.2	.3	.2	.3	.2	.2	.3	.1	.2	.3	.3	.3	.2	.3	.2	.2	.4	.4	.3

Responses of 'Don't know' were excluded from calculation of the mean.

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TABLE 30:

Please walk around your home and count all light bulbs, including those in closets, attics, garages, outdoor lights, etc. Please take note of how many bulbs are LED, how many screw into traditional light sockets, how many have a special screw-in base, how many are linear fluorescents (i.e., tube lights), and how many are smart lights.

Next, please indicate the total number of lightbulbs you have:

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
1-10	12	14	14	10	14	11	21	12	7	24	8	6	26	10	13	7	11	14	12	12	6	5	2	9
11-20	29	27	29	30	28	29	37	29	24	40	25	23	41	28	30	21	25	32	26	29	22	21	24	22
21-30	23	23	26	22	21	25	23	20	25	18	25	26	17	26	23	24	26	20	30	21	24	25	25	29
31-40	13	13	14	13	13	13	4	16	16	8	15	17	5	15	12	17	13	12	13	13	13	17	20	20
41-50	7	6	8	7	7	7	3	7	9	2	9	9	2	6	7	11	8	6	4	8	12	9	8	9
51 or more	10	10	5	11	11	9	4	9	14	4	13	14	1	9	10	16	13	7	13	9	19	17	15	8
Don't know	6	6	4	7	5	7	8	7	5	4	6	5	9	6	4	4	5	8	2	7	4	5	5	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	26.0	25.6	24.5	27.0	26.2	25.8	19.0	26.0	29.9	19.0	28.9	30.5	16.5	27.1	25.9	31.7	28.1	24.2	26.8	25.8	32.3	32.1	31.4	28.6

Responses of 'Don't know' or above 85 were excluded from calculation of the mean.

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TABLE 31B:

[IF Q30 NOT 'Don't know'] Next, please indicate…

How many are LED bulbs?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	10	8	9	11	10	9	14	8	8	14	8	7	15	11	7	6	5	13	6	11	6	4	8	11
1-10	35	36	31	35	37	33	46	31	31	42	32	27	51	33	35	29	33	36	33	35	21	27	26	33
11-20	25	23	26	26	25	25	21	27	25	26	24	28	18	23	28	27	28	22	29	24	25	30	32	23
21-30	14	14	15	14	14	14	6	14	18	6	17	17	8	19	12	16	15	13	18	13	17	16	16	19
31-40	6	8	4	4	5	6	1	10	5	3	6	8	1	6	5	6	7	5	4	6	10	5	9	8
41-50	4	3	2	5	4	3	1	3	5	1	5	5	1	3	4	8	5	2	5	3	8	7	5	0
51 or more	3	3	3	3	4	3	0	4	4	2	3	4	0	3	4	7	4	2	5	3	7	8	2	1
Don't know	5	5	9	3	2	7	10	2	3	6	4	4	5	3	5	2	3	6	2	5	6	3	3	5
WEIGHTED SAMPLE SIZE (#)	**939**	**408**	**139**	**392**	**452**	**484**	**223**	**303**	**413**	**251**	**603**	**639**	**300**	**397**	**547**	**248**	**433**	**505**	**215**	**723**	**160**	**160**	**135**	**151**
UNWEIGHTED SAMPLE SIZE (#)	**936**	**435**	**128**	**373**	**425**	**508**	**186**	**308**	**442**	**237**	**611**	**643**	**293**	**399**	**547**	**256**	**436**	**500**	**212**	**724**	**161**	**159**	**142**	**148**
MEAN	15.8	16.0	15.7	15.5	15.5	16.0	9.6	17.7	17.4	11.2	17.4	18.9	9.0	16.0	16.2	20.0	17.8	14.0	17.5	15.2	22.6	21.2	17.4	15.1

Responses of 'Don't know' or above 85 were excluded from calculation of the mean.

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TABLE 31C:

[IF Q30 NOT 'Don't know'] How many have a base sized like a normal light bulb, that is, they screw into your regular light sockets?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	4	5	1	5	6	3	3	3	5	5	4	4	4	3	5	3	3	5	4	4	5	5	5	3
1-10	25	30	28	20	26	25	37	23	21	38	20	18	42	23	26	18	23	28	26	25	17	13	15	20
11-20	28	25	33	29	29	27	34	29	24	28	29	25	34	28	29	23	28	28	28	28	23	29	30	21
21-30	19	16	21	21	17	20	12	17	23	11	21	23	10	24	16	21	19	18	21	18	22	17	20	32
31-40	10	12	6	10	9	11	5	13	11	5	12	13	4	11	9	11	12	9	7	11	11	13	21	11
41-50	4	3	4	6	5	4	1	3	7	4	4	6	0	5	4	9	5	4	5	4	8	6	5	6
51 or more	4	4	2	3	4	3	0	4	5	1	5	5	1	3	4	7	5	2	4	3	8	9	2	1
Don't know	6	5	5	6	4	7	9	6	4	8	4	6	4	3	7	7	5	6	5	6	6	8	2	5
WEIGHTED SAMPLE SIZE (#)	**939**	**408**	**139**	**392**	**452**	**484**	**223**	**303**	**413**	**251**	**603**	**639**	**300**	**397**	**547**	**248**	**433**	**505**	**215**	**723**	**160**	**160**	**135**	**151**
UNWEIGHTED SAMPLE SIZE (#)	**936**	**435**	**128**	**373**	**425**	**508**	**186**	**308**	**442**	**237**	**611**	**643**	**293**	**399**	**547**	**256**	**436**	**500**	**212**	**724**	**161**	**159**	**142**	**148**
MEAN	19.2	18.4	18.7	20.2	18.7	19.7	13.2	20.3	21.5	14.5	21.1	22.4	12.7	20.1	18.8	23.9	20.6	18.0	19.2	19.2	23.8	24.2	22.2	20.9

Responses of 'Don't know' or above 85 were excluded from calculation of the mean.

TABLE 31D:

[IF Q30 NOT 'Don't know'] How many have a specialty base? For example, a candelabra or are pin based?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	49	51	50	48	48	50	50	52	47	49	50	43	62	50	49	44	48	51	52	48	44	42	46	42
1-10	33	32	31	35	33	33	28	33	36	33	32	36	27	35	31	37	34	33	30	34	31	38	40	38
11-20	7	7	4	8	7	6	7	6	6	5	8	9	1	6	7	7	9	4	7	7	10	10	9	9
21-30	1	1	1	1	1	1	0	0	2	0	1	1	0	1	1	2	1	1	2	1	2	0	2	1
31-40	0	0	0	1	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0
41-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
51 or more	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't know	9	9	14	8	9	10	14	8	8	13	8	9	10	8	11	10	8	11	9	10	11	9	4	10
WEIGHTED SAMPLE SIZE (#)	**939**	**408**	**139**	**392**	**452**	**484**	**223**	**303**	**413**	**251**	**603**	**639**	**300**	**397**	**547**	**248**	**433**	**505**	**215**	**723**	**160**	**160**	**135**	**151**
UNWEIGHTED SAMPLE SIZE (#)	**936**	**435**	**128**	**373**	**425**	**508**	**186**	**308**	**442**	**237**	**611**	**643**	**293**	**399**	**547**	**256**	**436**	**500**	**212**	**724**	**161**	**159**	**142**	**148**
MEAN	3.1	3.1	2.6	3.3	3.5	2.8	2.5	2.9	3.6	2.2	3.6	3.9	1.4	3.1	3.3	3.4	3.6	2.7	3.2	3.1	4.4	4.0	3.7	3.6

Responses of 'Don't know' or above 85 were excluded from calculation of the mean.

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TABLE 31E:

[IF Q31B NOT 'Don't know'] How many are smart lights, that is, they can be controlled over the internet via a smart phone or computer?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	86	84	87	89	84	89	82	82	92	87	86	86	87	87	83	82	87	86	81	88	76	84	94	91
1-10	9	12	6	7	13	6	17	13	3	8	10	9	10	8	13	14	11	8	16	7	15	12	5	4
11-20	1	0	0	1	1	0	0	2	0	1	0	1	0	1	0	0	0	1	0	1	1	2	0	0
21-30	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0
31-40	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51 or more	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't know	4	3	5	3	3	4	1	4	4	2	3	4	2	4	3	4	2	5	2	4	8	1	1	4
WEIGHTED SAMPLE SIZE (#)	**896**	**390**	**126**	**380**	**443**	**450**	**200**	**297**	**399**	**237**	**577**	**611**	**285**	**385**	**518**	**242**	**419**	**477**	**212**	**684**	**150**	**156**	**131**	**143**
UNWEIGHTED SAMPLE SIZE (#)	**895**	**417**	**118**	**360**	**417**	**475**	**167**	**301**	**427**	**226**	**585**	**618**	**277**	**387**	**521**	**250**	**423**	**472**	**208**	**687**	**153**	**155**	**138**	**141**
MEAN	.5	.5	.8	.4	.6	.4	.4	.9	.2	.5	.5	.5	.4	.5	.6	.6	.5	.5	.8	.4	.6	1.0	.3	.3

Responses of 'Don't know' or above 85 were excluded from calculation of the mean.

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TABLE 31F:

[IF Q31B LESS THAN Q30] How many are linear fluorescents (i.e., tube lights)?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	51	58	53	44	48	55	63	58	40	50	52	44	69	45	54	48	48	54	56	50	51	46	35	42
1-10	44	38	39	51	45	43	31	37	55	45	43	51	28	50	41	49	47	41	35	46	43	51	59	52
11-20	2	2	3	2	3	1	1	2	3	1	2	3	1	3	2	2	2	3	4	2	2	3	3	4
21-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
41-50	0	0	0	1	1	0	1	0	0	0	1	1	0	0	0	0	1	0	2	0	0	0	2	0
51 or more	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't know	2	2	6	1	3	1	4	3	1	4	1	2	2	2	3	1	3	2	3	2	4	1	1	3
WEIGHTED SAMPLE SIZE (#)	**723**	**303**	**109**	**311**	**350**	**370**	**184**	**215**	**324**	**192**	**472**	**499**	**223**	**320**	**414**	**187**	**330**	**393**	**160**	**563**	**108**	**126**	**108**	**134**
UNWEIGHTED SAMPLE SIZE (#)	**712**	**324**	**96**	**292**	**323**	**386**	**151**	**216**	**345**	**177**	**474**	**497**	**215**	**319**	**413**	**194**	**328**	**384**	**157**	**555**	**107**	**126**	**113**	**128**
MEAN	1.8	1.3	1.3	2.4	2.2	1.3	1.7	1.2	2.2	1.2	1.9	2.2	.7	1.9	1.5	1.8	2.1	1.5	2.2	1.6	2.1	1.9	3.2	2.1

Responses of 'Don't know' or above 85 were excluded from calculation of the mean.

TABLE 31B-F (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q30 NOT 'Don't know'] Next, please indicate…

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Q31C. Proportion with a normal base	72	70	72	73	69	75	69	77	69	76	71	71	77	73	71	73	71	73	70	73	69	71	69	75
Q31B. Proportion LED	59	61	64	56	59	60	50	67	58	57	59	60	55	59	61	60	63	55	63	58	65	65	56	52
Q31D. Proportion with specialty base	11	12	9	11	13	10	12	10	12	10	12	12	7	11	12	11	12	10	12	11	13	12	12	11
Q31F. Proportion linear fluorescent	5	4	3	7	6	4	8	3	5	5	5	6	3	6	4	4	5	5	6	5	4	4	8	6
Q31E. Proportion smart lights	2	2	4	1	2	2	2	4	1	3	2	2	2	2	2	2	2	2	3	2	2	3	1	1
WEIGHTED SAMPLE SIZE (#)	**756**	**330**	**103**	**323**	**377**	**377**	**171**	**250**	**336**	**197**	**496**	**513**	**243**	**337**	**430**	**197**	**369**	**387**	**180**	**576**	**116**	**133**	**119**	**122**
UNWEIGHTED SAMPLE SIZE (#)	**758**	**357**	**97**	**304**	**358**	**398**	**142**	**253**	**363**	**190**	**503**	**520**	**238**	**338**	**433**	**206**	**372**	**386**	**177**	**581**	**119**	**134**	**126**	**119**

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TABLE 31aa:

How many of the following are in your home?

Manual light dimmers

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	54	49	59	58	48	60	61	57	49	65	52	46	71	54	52	46	52	56	43	58	36	46	51	48
1	18	19	18	18	21	17	11	17	24	16	19	22	11	21	18	25	19	18	21	18	20	23	25	24
2	11	14	7	10	13	10	9	11	13	9	12	14	6	12	12	13	13	10	15	10	13	19	13	13
3	3	4	2	3	5	2	4	3	3	2	4	4	1	2	3	7	4	3	5	3	6	4	4	3
4	3	2	5	3	3	3	2	3	4	2	4	4	1	4	4	2	3	3	5	2	4	1	4	7
5 or more	6	8	3	4	5	6	6	5	6	3	7	7	4	5	6	5	6	6	8	5	15	5	3	3
Don't know	4	4	6	4	5	3	8	4	2	4	3	3	5	3	4	1	4	4	3	4	5	3	1	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	1.1	1.3	.8	.9	1.2	.9	1.1	1.0	1.1	.6	1.2	1.3	.6	1.0	1.2	1.3	1.2	1.0	1.5	.9	2.0	1.1	1.0	1.1

Responses of 'Don't know' or above 15 were excluded from calculation of the mean.

TABLE 31ab:

How many of the following are in your home?

Indoor motion sensors that activate/turn off lights

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	92	90	92	93	92	92	87	92	94	89	94	92	92	92	90	92	90	93	91	92	89	93	92	95
1	3	5	4	2	3	3	4	4	3	4	3	4	3	4	4	5	4	3	4	3	4	3	5	2
2	1	2	0	1	1	1	2	1	1	1	1	1	1	0	2	2	1	1	2	1	1	1	1	0
3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5 or more	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Don't know	3	3	4	3	4	3	6	3	1	4	2	3	4	3	3	1	4	3	2	4	4	3	1	2
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.1	.1	.0	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0

Responses of 'Don't know' or above 5 were excluded from calculation of the mean.

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TABLE 31ac:

How many of the following are in your home?

Outdoor motion sensors that activate/turn off lights

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	66	68	64	64	62	69	72	67	62	72	65	59	81	62	63	56	59	72	64	66	60	58	53	59
1	19	16	22	22	22	17	16	19	21	17	20	23	12	22	21	26	23	17	20	19	21	25	24	25
2	9	9	6	9	8	9	4	10	11	4	10	12	2	11	9	13	10	7	11	8	12	11	16	10
3	1	1	2	1	2	0	0	0	2	0	1	2	0	2	1	1	1	1	1	1	1	3	2	2
4	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	0	2	1
5 or more	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	2	2	0	1	1	3	1	2	0
Don't know	3	4	4	3	3	3	7	3	2	4	2	3	5	3	3	1	4	3	3	4	3	2	0	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	.5	.5	.5	.5	.6	.4	.3	.5	.6	.4	.5	.6	.2	.6	.6	.7	.7	.4	.5	.5	.7	.7	.8	.6

Responses of 'Don't know' were excluded from calculation of the mean.

TABLE 32_1:

Before today, how familiar were you with:

Heat Pump Water Heaters

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	10	13	7	8	11	9	12	8	11	10	10	10	11	10	13	22	16	5	50	0	17	6	5	11
9	3	4	3	1	3	3	4	1	3	1	3	2	3	3	2	3	2	3	14	0	3	0	7	0
8	3	1	6	3	3	2	4	2	2	7	1	2	4	5	2	0	4	1	13	0	0	0	3	6
7	5	3	5	6	8	2	8	4	3	0	7	4	6	5	5	3	6	3	23	0	2	4	2	8
6	7	7	6	8	6	8	4	11	7	10	6	7	7	7	9	6	5	10	0	9	13	2	9	10
5	12	10	3	16	12	12	20	7	11	9	12	12	12	8	12	9	11	12	0	15	12	17	13	2
4	7	8	16	3	3	10	8	8	5	7	7	6	8	6	8	5	6	8	0	9	2	10	6	6
3	4	4	9	2	2	5	3	2	5	3	4	4	3	3	3	1	0	7	0	4	2	5	6	0
2	6	8	3	6	4	8	6	7	5	6	6	7	4	5	7	9	3	9	0	8	11	8	5	6
1	5	5	5	5	6	3	3	4	6	7	4	4	5	5	5	1	3	6	0	6	4	1	3	13
0 - Completely unfamiliar	39	37	36	42	40	38	27	46	42	40	40	41	36	43	34	43	43	36	0	49	34	47	40	39
WEIGHTED SAMPLE SIZE (#)	**252**	**107**	**34**	**111**	**122**	**129**	**68**	**81**	**103**	**64**	**159**	**163**	**89**	**111**	**141**	**69**	**121**	**131**	**51**	**201**	**38**	**50**	**40**	**30**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**115**	**32**	**103**	**111**	**138**	**55**	**84**	**111**	**58**	**163**	**165**	**85**	**113**	**137**	**72**	**120**	**130**	**48**	**202**	**39**	**46**	**43**	**31**
TOP 3 (8-10)	16	18	17	13	17	15	21	11	16	19	14	14	18	19	17	24	22	9	77	0	20	6	15	17
MID 4 (4-7)	31	28	31	33	30	32	40	30	26	26	31	29	34	26	34	22	28	33	23	33	29	33	31	25
BOTTOM 4 (0-3)	54	53	52	54	53	54	39	59	59	56	55	57	48	55	49	53	50	57	0	67	51	61	54	58
MEAN	3.4	3.6	3.4	3.2	3.5	3.3	4.3	2.9	3.2	3.3	3.3	3.2	3.7	3.4	3.7	3.8	3.7	3.1	8.9	2.0	3.9	2.6	3.3	3.3

This question was randomly posed to approximately one in four respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 32_2:

Before today, how familiar were you with:

ENERGY STAR Mini Split Heat Pumps

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	10	8	9	13	12	9	5	11	13	12	10	15	1	6	11	25	18	5	41	0	16	27	8	4
9	4	6	0	3	5	2	5	6	1	4	4	4	2	3	4	5	8	1	14	0	2	2	4	7
8	7	7	4	7	12	2	10	1	8	6	6	8	3	6	6	14	13	2	26	0	8	5	18	8
7	5	2	9	6	7	2	2	4	7	6	5	6	2	6	4	5	6	4	19	0	9	2	4	11
6	5	2	2	9	6	4	7	5	3	2	7	5	4	5	7	10	10	1	0	7	9	5	4	4
5	12	13	8	13	12	12	9	13	14	10	12	14	7	17	10	15	13	12	0	16	15	14	13	15
4	5	8	5	3	4	6	8	3	5	3	6	5	6	5	5	5	6	4	0	7	9	2	4	5
3	8	3	20	8	3	12	14	8	4	7	8	5	14	11	6	2	4	10	0	10	1	6	9	1
2	2	2	2	2	3	2	1	2	3	1	2	2	3	3	3	4	1	3	0	3	2	0	0	4
1	6	6	5	6	4	8	6	6	5	4	7	4	9	6	5	0	3	8	0	8	0	7	7	6
0 - Completely unfamiliar	37	42	37	32	32	41	33	40	37	46	34	31	48	33	40	16	19	50	0	49	28	31	30	36
WEIGHTED SAMPLE SIZE (#)	**255**	**106**	**42**	**107**	**123**	**132**	**67**	**74**	**113**	**59**	**168**	**173**	**82**	**102**	**154**	**58**	**106**	**149**	**65**	**191**	**45**	**42**	**29**	**45**
UNWEIGHTED SAMPLE SIZE (#)	**252**	**112**	**41**	**99**	**113**	**138**	**60**	**73**	**119**	**57**	**164**	**176**	**76**	**99**	**153**	**63**	**104**	**148**	**63**	**189**	**47**	**45**	**29**	**42**
TOP 3 (8-10)	20	21	13	23	29	13	20	18	22	22	20	28	6	15	21	44	38	8	81	0	27	34	30	19
MID 4 (4-7)	27	25	24	30	29	24	25	25	29	21	30	30	20	33	26	34	35	22	19	30	42	22	25	34
BOTTOM 4 (0-3)	53	54	64	47	42	63	54	57	49	57	50	42	75	52	53	22	27	70	0	70	32	43	46	47
MEAN	3.7	3.4	3.2	4.1	4.4	2.9	3.6	3.4	3.8	3.4	3.8	4.4	2.1	3.5	3.6	6.1	5.5	2.3	8.8	1.9	4.8	4.8	4.2	3.7

This question was randomly posed to approximately one in four respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 32_3:

Before today, how familiar were you with:

Heat Pump Clothes Dryers

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	3	6	0	1	5	1	10	1	2	0	4	1	8	5	3	1	3	3	36	0	2	0	0	1
9	2	1	3	2	1	2	3	2	1	4	0	2	0	1	2	4	3	0	18	0	6	0	0	4
8	1	2	0	1	2	1	5	1	0	5	0	1	2	0	2	1	3	0	14	0	0	2	0	2
7	3	3	3	2	4	2	4	4	1	0	4	3	2	3	3	3	4	1	32	0	3	3	0	6
6	2	2	0	2	4	0	1	2	2	4	1	1	5	1	2	0	2	2	0	2	0	0	0	3
5	4	5	7	1	3	4	4	6	2	8	3	4	4	6	2	1	3	5	0	4	5	0	4	7
4	3	3	6	2	4	2	7	5	0	4	2	4	1	2	4	0	4	2	0	3	3	6	0	2
3	3	2	0	6	3	3	6	3	2	8	1	2	7	1	4	2	1	6	0	4	1	4	0	2
2	4	5	0	4	4	3	6	2	4	5	3	3	5	3	5	3	2	5	0	4	4	0	3	5
1	6	5	9	7	6	7	2	7	7	6	7	6	7	7	7	9	5	8	0	7	7	5	7	4
0 - Completely unfamiliar	69	65	73	74	63	74	52	67	78	56	74	74	57	70	66	76	70	69	0	76	70	81	86	65
WEIGHTED SAMPLE SIZE (#)	**248**	**115**	**35**	**98**	**111**	**137**	**45**	**94**	**108**	**67**	**158**	**174**	**73**	**119**	**134**	**63**	**123**	**124**	**22**	**226**	**40**	**40**	**39**	**42**
UNWEIGHTED SAMPLE SIZE (#)	**256**	**121**	**34**	**101**	**112**	**144**	**42**	**93**	**121**	**66**	**166**	**181**	**75**	**124**	**140**	**65**	**128**	**128**	**20**	**236**	**40**	**42**	**42**	**45**
TOP 3 (8-10)	6	10	3	3	8	4	18	3	3	9	4	4	10	6	8	6	9	3	68	0	7	2	0	7
MID 4 (4-7)	12	15	15	7	15	9	16	17	5	16	10	11	13	13	10	4	13	10	32	10	10	9	4	17
BOTTOM 4 (0-3)	82	76	82	90	77	87	65	80	92	75	86	85	77	81	82	90	78	87	0	90	83	90	96	76
MEAN	1.4	1.9	1.1	1.0	1.9	1.1	2.8	1.4	.8	2.0	1.2	1.1	2.1	1.4	1.5	1.0	1.7	1.2	8.6	.7	1.4	.7	.3	1.8

This question was randomly posed to approximately one in four respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 32_4:

Before today, how familiar were you with:

Energy Efficient Clothes Washers

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	13	13	20	10	10	16	8	13	15	12	14	14	10	11	16	11	21	7	38	0	11	7	15	27
9	4	7	3	2	3	5	3	6	4	3	5	5	3	4	3	6	5	4	13	0	2	8	9	5
8	7	9	6	7	9	6	1	10	9	4	6	8	7	12	6	7	14	2	22	0	6	4	10	11
7	9	12	20	3	10	8	11	11	6	6	11	10	8	10	8	11	11	8	27	0	15	8	9	9
6	12	10	6	16	9	15	4	16	14	9	12	14	8	9	14	22	7	15	0	18	18	21	3	10
5	19	20	13	19	20	16	23	11	21	20	19	22	13	19	19	22	18	19	0	28	28	17	29	11
4	8	8	6	9	11	6	16	6	6	11	9	7	11	5	10	5	4	11	0	13	8	10	4	6
3	9	9	0	12	8	10	12	14	4	13	8	6	14	10	7	7	8	10	0	14	0	7	10	8
2	3	4	3	2	5	2	4	3	3	3	2	4	2	4	4	0	1	4	0	5	5	4	2	3
1	3	1	6	4	3	3	6	1	3	1	2	2	4	1	2	1	0	5	0	4	2	2	3	3
0 - Completely unfamiliar	13	8	17	16	12	13	13	10	14	19	10	8	20	14	10	7	10	14	0	19	4	12	7	8
WEIGHTED SAMPLE SIZE (#)	**247**	**107**	**33**	**107**	**121**	**124**	**62**	**76**	**109**	**71**	**154**	**162**	**85**	**91**	**143**	**67**	**104**	**144**	**83**	**164**	**44**	**37**	**34**	**38**
UNWEIGHTED SAMPLE SIZE (#)	**244**	**116**	**28**	**100**	**114**	**128**	**45**	**83**	**116**	**65**	**158**	**159**	**85**	**92**	**143**	**68**	**106**	**138**	**87**	**157**	**43**	**37**	**36**	**35**
TOP 3 (8-10)	24	29	29	19	22	27	12	29	28	19	26	27	20	27	25	25	40	13	73	0	19	19	34	42
MID 4 (4-7)	48	49	44	48	51	45	54	43	48	45	52	53	39	43	51	60	40	54	27	58	70	56	44	36
BOTTOM 4 (0-3)	28	22	26	34	27	27	34	27	24	35	22	20	41	29	24	16	20	33	0	42	11	25	22	22
MEAN	5.2	5.7	5.5	4.7	5.1	5.4	4.5	5.6	5.4	4.6	5.6	5.7	4.4	5.2	5.4	5.9	6.2	4.5	8.6	3.5	5.8	5.1	5.9	6.3

This question was randomly posed to approximately one in four respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 35A:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[100] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	29	30	29	29	29	30	34	33	23	26	30	29	29	23	29	25	29	29	39	26	38	30	26	23
No	71	70	71	71	71	70	66	67	77	74	70	71	71	77	71	75	71	71	61	74	62	70	74	77
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

TABLE 35B:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[250] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	41	43	46	37	45	37	43	46	36	35	44	44	35	37	39	43	44	38	55	36	52	42	46	40
No	59	57	54	63	55	63	57	54	64	65	56	56	65	63	61	57	56	62	45	64	48	58	54	60
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 35C:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[400] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	52	55	61	45	55	49	55	54	49	42	57	57	41	49	52	55	56	49	68	47	65	52	61	54
No	48	45	39	55	45	51	45	46	51	58	43	43	59	51	48	45	44	51	32	53	35	48	39	46
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

TABLE 35D:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[550] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	61	62	71	56	65	56	70	61	55	56	65	67	50	62	61	69	64	59	77	56	75	63	65	64
No	39	38	29	44	35	44	30	39	45	44	35	33	50	38	39	31	36	41	23	44	25	37	35	36
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 35E:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[700] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	69	70	78	65	73	64	81	70	59	63	73	73	61	67	69	77	71	67	83	64	85	69	69	70
No	31	30	22	35	27	36	19	30	41	37	27	27	39	33	31	23	29	33	17	36	15	31	31	30
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

TABLE 35F:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[850] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	72	74	81	67	75	68	84	74	63	66	76	77	62	70	73	82	74	71	85	68	87	74	75	74
No	28	26	19	33	25	32	16	26	37	34	24	23	38	30	27	18	26	29	15	32	13	26	25	26
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 35G:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[1000] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	78	78	87	75	82	74	89	81	70	71	82	85	65	78	79	88	79	77	86	76	93	84	82	83
No	22	22	13	25	18	26	11	19	30	29	18	15	35	22	21	12	21	23	14	24	7	16	18	17
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

TABLE 35H:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[1150] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	81	83	89	77	84	78	91	84	73	72	86	88	69	82	82	89	84	79	88	79	94	85	88	84
No	19	17	11	23	16	22	9	16	27	28	14	12	31	18	18	11	16	21	12	21	6	15	12	16
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 35I:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing new [ITEM SEEN IN Q32].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $1,000 if the project saved $[1300] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	83	84	90	79	85	81	92	86	74	74	88	89	71	85	84	89	85	81	89	81	95	87	88	86
No	17	16	10	21	15	19	8	14	26	26	12	11	29	15	16	11	15	19	11	19	5	13	12	14
WEIGHTED SAMPLE SIZE (#)	**501**	**222**	**73**	**207**	**261**	**238**	**140**	**160**	**202**	**142**	**330**	**336**	**165**	**208**	**297**	**138**	**236**	**266**	**125**	**376**	**91**	**86**	**62**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**493**	**235**	**66**	**192**	**243**	**248**	**111**	**162**	**220**	**129**	**334**	**336**	**157**	**206**	**289**	**145**	**233**	**260**	**123**	**370**	**96**	**84**	**62**	**80**

This table excludes those who responded 'Don't know' to any of Q35a-i.

TABLE 33_1:

Before today, how familiar were you with:

Networked/Connected – Indoor LED lights (i.e., smart light bulbs)

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	7	6	22	2	9	5	0	13	9	5	6	8	6	3	9	6	28	0	18	4	10	17	0	7
9	3	4	0	5	1	6	6	2	3	4	3	5	0	5	3	10	13	0	0	4	4	6	7	0
8	5	5	9	3	5	5	4	5	6	12	3	4	7	5	3	6	19	0	7	4	7	0	11	0
7	11	7	17	14	11	11	23	11	4	10	11	12	9	15	12	2	41	0	3	13	18	7	17	7
6	7	8	0	7	8	5	6	15	2	13	4	3	13	16	4	2	0	9	7	6	0	0	0	12
5	13	12	11	15	17	9	21	6	13	4	17	17	6	5	17	20	0	18	13	13	26	15	0	28
4	9	10	10	6	11	6	6	7	12	7	10	9	7	6	8	9	0	12	12	8	8	18	10	0
3	4	5	0	5	5	3	8	0	4	0	5	5	2	5	3	12	0	5	7	3	3	0	11	11
2	8	8	0	13	10	7	7	2	13	9	8	6	12	9	8	8	0	11	4	10	7	0	6	14
1	6	5	5	8	10	1	0	0	14	6	6	8	2	7	7	6	0	8	5	6	6	13	5	12
0 - Completely unfamiliar	26	30	26	22	13	43	20	40	22	29	27	22	35	24	26	19	0	36	22	28	9	23	33	7
WEIGHTED SAMPLE SIZE (#)	**108**	**52**	**19**	**37**	**59**	**49**	**30**	**31**	**47**	**28**	**76**	**69**	**38**	**37**	**71**	**30**	**29**	**79**	**24**	**84**	**20**	**16**	**11**	**16**
UNWEIGHTED SAMPLE SIZE (#)	**105**	**52**	**16**	**37**	**56**	**49**	**24**	**31**	**50**	**28**	**73**	**69**	**36**	**39**	**69**	**30**	**28**	**77**	**22**	**83**	**21**	**14**	**11**	**15**
TOP 3 (8-10)	16	15	30	10	16	16	10	20	17	22	12	17	13	13	15	21	59	0	26	13	22	22	18	7
MID 4 (4-7)	39	38	38	42	47	31	55	38	30	34	42	41	36	42	41	34	41	39	36	40	52	41	27	48
BOTTOM 4 (0-3)	45	48	32	48	38	53	35	43	53	44	46	42	50	45	44	45	0	61	39	47	26	37	56	45
MEAN	4.0	3.7	5.0	3.8	4.4	3.4	4.5	4.1	3.6	4.1	3.7	4.2	3.5	4.0	4.0	4.2	8.3	2.4	4.6	3.8	5.2	4.3	3.6	4.1

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_2:

Before today, how familiar were you with:

LED Screw-in General Service Lights (i.e., LED light that screw into your existing sockets)

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	39	37	31	43	43	36	41	27	48	47	39	39	40	47	42	44	59	0	47	37	31	37	39	47
9	12	10	0	16	11	13	0	9	19	3	11	11	13	14	9	12	18	0	24	9	15	6	22	0
8	8	8	19	7	7	9	0	13	7	10	9	7	11	7	8	15	12	0	8	8	8	7	12	0
7	8	13	20	0	9	6	6	12	5	11	8	10	0	9	8	4	11	0	9	7	4	10	7	28
6	7	6	18	6	4	10	11	6	7	13	7	8	5	3	8	8	0	22	0	9	14	4	5	7
5	10	8	0	14	13	7	16	15	4	3	11	12	6	2	9	17	0	30	12	10	15	10	15	0
4	8	8	0	9	10	6	6	11	6	8	4	6	14	15	5	0	0	23	0	10	3	9	0	18
3	2	4	0	1	4	1	9	2	0	0	4	3	0	0	4	0	0	7	0	3	7	4	0	0
2	2	3	0	1	0	4	7	2	0	0	3	0	8	1	0	0	0	6	0	2	0	0	0	0
1	1	2	0	0	0	1	0	0	2	0	1	1	0	0	1	0	0	2	0	1	0	4	0	0
0 - Completely unfamiliar	3	2	12	3	0	6	5	2	4	4	4	3	3	2	6	0	0	10	0	4	3	9	0	0
WEIGHTED SAMPLE SIZE (#)	**101**	**44**	**8**	**48**	**47**	**54**	**19**	**36**	**45**	**21**	**68**	**74**	**26**	**47**	**55**	**31**	**67**	**34**	**20**	**80**	**26**	**18**	**16**	**11**
UNWEIGHTED SAMPLE SIZE (#)	**102**	**48**	**8**	**46**	**45**	**57**	**14**	**38**	**50**	**20**	**70**	**74**	**28**	**47**	**56**	**33**	**68**	**34**	**21**	**81**	**23**	**19**	**16**	**11**
TOP 3 (8-10)	59	54	50	65	60	58	41	50	73	61	60	57	65	68	59	71	89	0	79	54	54	50	72	47
MID 4 (4-7)	33	36	38	29	36	30	39	44	21	35	29	36	24	29	29	29	11	75	21	36	36	33	28	53
BOTTOM 4 (0-3)	8	10	12	6	4	13	21	6	6	4	11	8	11	3	12	0	0	25	0	11	10	18	0	0
MEAN	7.5	7.4	7.1	7.7	7.8	7.2	6.6	7.1	8.2	7.9	7.5	7.5	7.4	8.0	7.4	8.3	9.2	4.1	8.7	7.2	7.3	6.7	8.4	7.8

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_3:

Before today, how familiar were you with:

Smart Power Bars

		REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
	OVERALL %	HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	9	9	15	5	11	8	9	13	7	10	10	9	8	6	11	10	37	0	19	7	12	0	9	12
9	6	2	13	5	6	6	0	4	9	8	5	7	4	4	8	13	24	0	17	3	4	0	16	6
8	3	5	0	4	1	6	0	3	5	10	1	4	2	4	4	0	14	0	4	3	8	4	0	4
7	6	2	8	8	6	4	0	17	2	7	5	6	6	10	6	0	25	0	16	4	5	0	0	13
6	4	2	3	6	7	1	0	10	2	0	6	5	3	4	4	3	0	5	6	3	12	8	0	0
5	12	16	8	11	17	8	13	3	17	18	10	9	19	10	11	10	0	16	5	13	6	19	11	0
4	2	5	0	0	3	0	0	4	1	0	2	1	4	3	2	2	0	2	0	2	0	0	0	3
3	9	7	7	11	7	10	4	13	8	10	9	9	8	7	6	17	0	11	5	9	14	0	14	8
2	7	12	4	4	4	8	16	9	1	8	5	7	6	6	9	3	0	9	10	6	12	10	0	9
1	8	10	4	8	7	10	12	0	11	0	11	9	6	5	12	9	0	11	0	10	8	28	3	0
0 - Completely unfamiliar	35	29	38	38	31	40	46	25	37	29	37	36	34	41	27	32	0	46	18	39	18	32	47	45
WEIGHTED SAMPLE SIZE (#)	**93**	**32**	**24**	**38**	**46**	**45**	**19**	**27**	**48**	**26**	**60**	**65**	**28**	**47**	**46**	**25**	**23**	**71**	**17**	**76**	**14**	**15**	**17**	**17**
UNWEIGHTED SAMPLE SIZE (#)	**101**	**40**	**23**	**38**	**45**	**54**	**19**	**30**	**52**	**24**	**67**	**71**	**30**	**50**	**51**	**28**	**25**	**76**	**19**	**82**	**17**	**16**	**18**	**18**
TOP 3 (8-10)	18	16	28	14	18	19	9	20	20	28	15	20	15	14	22	23	75	0	40	13	24	4	25	22
MID 4 (4-7)	24	26	19	25	33	13	13	33	22	25	22	20	32	27	24	15	25	23	28	23	24	27	11	16
BOTTOM 4 (0-3)	58	59	53	61	49	68	78	47	57	47	62	60	54	59	54	61	0	77	32	64	52	69	64	62
MEAN	3.5	3.3	4.1	3.2	3.9	3.1	2.1	4.5	3.4	4.4	3.2	3.5	3.5	3.3	3.9	3.6	8.7	1.8	5.8	3.0	4.4	2.2	3.3	3.5

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_4:

Before today, how familiar were you with:

Dimmer Switches

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	36	41	37	32	33	40	31	37	39	32	40	39	32	37	38	32	59	0	53	31	36	44	35	48
9	12	9	20	12	12	11	2	16	13	17	11	17	3	9	15	16	19	0	22	8	12	19	18	16
8	5	6	0	6	5	6	11	3	4	3	6	5	6	6	5	8	9	0	6	5	5	3	6	8
7	9	12	5	6	11	6	4	12	8	8	10	9	8	14	5	6	14	0	7	9	8	14	3	10
6	6	2	11	9	8	5	0	10	7	8	5	7	6	12	3	5	0	17	0	9	0	3	6	6
5	11	5	0	19	14	7	11	12	9	5	12	9	13	7	14	14	0	28	2	14	18	5	14	4
4	6	10	0	3	3	9	11	4	4	10	1	3	10	5	7	0	0	15	0	7	8	0	0	4
3	2	2	5	2	2	3	2	1	3	4	2	2	4	1	3	3	0	6	0	3	5	0	0	3
2	3	2	0	5	2	5	0	0	8	4	3	4	2	5	1	5	0	9	0	5	8	0	10	0
1	1	0	0	2	0	2	0	0	2	0	1	1	0	0	2	0	0	2	0	1	0	6	0	0
0 - Completely unfamiliar	9	11	23	3	11	6	27	4	2	9	8	5	15	4	9	12	0	22	11	8	0	6	9	0
WEIGHTED SAMPLE SIZE (#)	**124**	**52**	**14**	**59**	**65**	**60**	**28**	**47**	**50**	**29**	**80**	**77**	**47**	**57**	**72**	**24**	**77**	**47**	**32**	**92**	**15**	**19**	**19**	**19**
UNWEIGHTED SAMPLE SIZE (#)	**125**	**57**	**13**	**55**	**62**	**63**	**22**	**47**	**56**	**28**	**81**	**80**	**45**	**59**	**72**	**25**	**82**	**43**	**31**	**94**	**15**	**20**	**20**	**19**
TOP 3 (8-10)	53	57	57	50	50	57	44	57	56	52	57	61	41	51	58	56	86	0	81	44	53	66	58	72
MID 4 (4-7)	31	28	15	38	36	27	26	38	28	32	28	27	38	38	28	24	14	60	9	39	35	22	23	24
BOTTOM 4 (0-3)	15	15	28	12	14	16	30	6	16	17	15	12	21	11	14	20	0	40	11	17	13	12	19	3
MEAN	7.0	7.1	6.6	7.0	6.9	7.1	5.5	7.7	7.2	6.9	7.3	7.6	6.1	7.3	7.1	6.8	9.2	3.4	8.3	6.6	7.2	7.8	7.0	8.4

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_5:

Before today, how familiar were you with:

Programmable or Smart thermostats

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	14	12	16	14	19	9	7	5	22	21	11	15	11	15	14	20	38	0	39	7	10	6	31	14
9	4	12	0	0	3	5	3	3	6	4	3	6	0	7	2	2	12	0	13	2	3	10	0	13
8	7	12	6	4	4	10	13	5	6	3	9	7	9	7	9	12	21	0	14	6	3	12	3	4
7	10	9	9	11	16	5	7	12	10	4	15	9	13	8	10	2	28	0	4	11	10	7	20	0
6	14	14	17	14	17	12	7	28	10	7	20	16	10	9	23	21	0	22	5	17	26	19	10	12
5	16	25	16	8	9	19	11	29	9	12	18	17	11	15	13	9	0	24	9	17	15	12	4	34
4	6	6	6	5	2	9	9	2	6	4	6	5	7	10	2	9	0	9	8	5	13	8	0	0
3	4	3	0	7	2	6	8	5	2	8	3	3	7	2	5	2	0	7	0	6	0	4	0	4
2	6	0	18	6	11	2	20	0	2	11	3	1	16	7	5	0	0	9	0	7	0	0	0	6
1	6	2	6	9	6	6	0	2	11	8	6	9	0	5	9	8	0	9	5	6	6	7	18	6
0 - Completely unfamiliar	13	5	6	21	9	16	13	7	16	19	6	12	15	15	7	14	0	20	3	15	14	16	13	6
WEIGHTED SAMPLE SIZE (#)	**106**	**40**	**18**	**49**	**49**	**57**	**26**	**30**	**50**	**29**	**66**	**74**	**33**	**43**	**58**	**28**	**37**	**69**	**23**	**83**	**20**	**16**	**17**	**18**
UNWEIGHTED SAMPLE SIZE (#)	**101**	**40**	**15**	**46**	**44**	**56**	**20**	**31**	**50**	**26**	**65**	**75**	**26**	**43**	**54**	**28**	**38**	**63**	**22**	**79**	**21**	**17**	**17**	**17**
TOP 3 (8-10)	25	36	22	18	27	24	23	14	33	28	23	28	20	29	25	34	72	0	65	14	16	28	34	32
MID 4 (4-7)	46	54	49	38	45	46	36	72	35	27	59	48	42	42	49	41	28	55	27	51	64	45	34	46
BOTTOM 4 (0-3)	29	11	29	44	28	30	41	14	31	45	18	25	38	29	26	24	0	45	8	35	20	27	32	22
MEAN	5.2	6.3	5.2	4.4	5.6	4.9	4.6	5.5	5.4	4.7	5.7	5.4	4.8	5.2	5.5	5.5	8.6	3.4	7.6	4.6	5.1	5.1	5.8	5.7

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_6:

Before today, how familiar were you with:

Occupancy Sensors

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	5	5	6	4	7	1	0	4	7	7	4	5	4	7	4	10	36	0	17	1	5	0	6	4
9	1	1	5	0	1	1	0	2	2	0	1	2	0	0	2	3	10	0	0	2	0	0	4	4
8	2	4	0	0	1	3	0	4	1	0	3	2	1	3	0	0	16	0	0	3	0	11	0	0
7	5	4	0	7	9	0	0	10	3	0	7	5	4	6	5	3	39	0	2	6	10	7	0	5
6	5	5	5	5	7	2	5	7	3	4	4	5	4	2	8	8	0	6	6	4	11	4	6	0
5	15	12	31	13	10	20	3	14	21	14	16	21	3	25	11	8	0	17	13	16	13	15	29	23
4	8	12	8	4	9	7	18	2	9	0	12	8	9	10	9	8	0	9	20	5	15	0	5	11
3	8	5	19	8	5	11	6	10	7	7	8	5	14	8	8	6	0	9	17	5	5	0	8	6
2	8	3	0	17	12	4	22	9	2	21	5	8	9	3	13	11	0	10	3	10	0	25	0	11
1	6	12	8	0	4	9	11	5	6	0	8	5	9	4	7	5	0	7	0	8	0	8	9	5
0 - Completely unfamiliar	37	37	18	42	34	40	36	33	40	46	32	34	42	31	34	38	0	42	21	41	41	30	33	31
WEIGHTED SAMPLE SIZE (#)	**116**	**54**	**14**	**48**	**62**	**54**	**23**	**42**	**51**	**27**	**76**	**79**	**37**	**55**	**65**	**27**	**15**	**101**	**25**	**91**	**20**	**16**	**18**	**21**
UNWEIGHTED SAMPLE SIZE (#)	**118**	**58**	**14**	**46**	**60**	**58**	**21**	**42**	**55**	**23**	**81**	**80**	**38**	**54**	**64**	**30**	**16**	**102**	**26**	**92**	**20**	**16**	**20**	**20**
TOP 3 (8-10)	8	10	11	4	9	6	0	10	10	7	8	9	6	10	6	13	61	0	17	5	5	11	9	7
MID 4 (4-7)	33	33	43	30	36	30	26	33	36	18	39	39	20	44	32	27	39	32	41	31	49	26	40	39
BOTTOM 4 (0-3)	59	56	46	67	55	64	74	57	54	74	53	52	74	46	62	60	0	68	41	64	46	63	50	54
MEAN	2.9	2.9	3.9	2.6	3.3	2.5	1.9	3.3	3.0	2.3	3.2	3.2	2.3	3.5	2.8	3.1	8.4	2.1	4.3	2.5	3.2	2.9	3.3	3.1

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_7:

Before today, how familiar were you with:

Low flow Showerheads

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	30	27	24	36	31	29	14	45	29	34	23	30	29	31	30	29	49	0	54	25	22	38	20	33
9	5	4	6	7	6	4	0	7	7	2	8	6	2	4	5	7	9	0	7	5	0	15	11	0
8	13	12	0	19	14	11	12	7	17	14	14	13	11	10	17	23	21	0	18	12	26	15	17	5
7	13	12	6	16	16	9	16	13	10	6	17	14	10	15	10	15	21	0	9	13	6	14	18	20
6	7	6	12	6	4	10	10	5	6	4	9	8	2	10	5	14	0	17	6	7	8	5	15	11
5	8	11	9	5	9	8	10	2	11	6	11	9	8	6	11	9	0	21	0	10	12	5	8	11
4	9	12	15	3	6	12	6	6	12	11	8	6	15	9	9	4	0	22	0	11	8	5	11	5
3	3	2	12	0	4	2	7	4	0	7	2	3	4	7	2	0	0	7	0	4	0	0	0	10
2	2	4	0	0	0	3	2	0	2	0	1	1	2	0	1	0	0	4	6	1	9	0	0	0
1	2	0	12	0	4	0	7	0	0	7	0	3	0	0	3	0	0	5	0	2	0	0	0	0
0 - Completely unfamiliar	9	11	5	9	7	11	16	10	4	8	8	6	17	9	7	0	0	23	0	11	9	4	0	5
WEIGHTED SAMPLE SIZE (#)	**111**	**49**	**18**	**45**	**55**	**57**	**30**	**31**	**50**	**31**	**67**	**81**	**30**	**49**	**61**	**29**	**67**	**44**	**19**	**92**	**13**	**23**	**16**	**22**
UNWEIGHTED SAMPLE SIZE (#)	**109**	**52**	**16**	**41**	**48**	**61**	**26**	**31**	**52**	**29**	**67**	**77**	**32**	**46**	**62**	**30**	**65**	**44**	**21**	**88**	**14**	**20**	**19**	**18**
TOP 3 (8-10)	48	42	29	62	51	45	26	60	54	51	45	50	42	45	52	59	79	0	79	41	48	68	48	38
MID 4 (4-7)	36	41	43	29	34	38	42	26	40	28	45	37	34	40	35	41	21	60	14	41	34	28	52	47
BOTTOM 4 (0-3)	16	17	28	9	14	17	32	14	7	22	10	13	23	15	13	0	0	40	6	18	18	4	0	15
MEAN	6.7	6.3	5.5	7.5	7.0	6.4	5.1	7.4	7.1	6.5	6.8	7.0	5.9	6.7	6.8	7.8	8.9	3.3	8.6	6.3	6.3	8.0	7.3	6.8

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_8:

Before today, how familiar were you with:

Low-Flow Faucet Aerators

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	20	21	0	25	18	20	11	12	31	10	23	23	14	18	26	32	39	0	34	14	25	28	25	10
9	4	2	0	8	4	5	0	4	8	8	3	6	2	6	4	2	9	0	12	2	0	8	0	11
8	10	9	16	8	18	5	13	4	13	12	11	7	15	7	3	9	19	0	25	4	0	0	21	11
7	16	20	8	14	23	12	32	12	9	11	17	13	22	22	9	7	32	0	8	19	15	8	9	23
6	5	3	17	2	2	6	0	11	2	0	6	7	0	0	6	12	0	9	8	3	15	5	0	9
5	13	19	0	10	9	15	22	19	3	24	9	7	24	11	19	15	0	26	5	16	9	13	6	0
4	4	5	0	4	7	2	0	3	8	0	7	6	0	2	5	2	0	8	6	3	4	9	7	5
3	5	3	27	0	2	7	0	7	7	0	7	6	3	10	5	0	0	10	0	7	11	3	9	6
2	3	2	7	2	8	0	0	2	6	6	3	4	1	5	3	0	0	6	3	3	0	5	0	11
1	2	1	5	3	0	4	2	6	0	0	3	4	0	4	2	5	0	5	0	3	8	0	12	0
0 - Completely unfamiliar	18	13	20	23	8	24	20	21	14	30	11	17	19	17	17	15	0	36	0	25	14	21	12	15
WEIGHTED SAMPLE SIZE (#)	**111**	**53**	**14**	**44**	**42**	**69**	**29**	**37**	**45**	**32**	**64**	**72**	**39**	**39**	**56**	**29**	**55**	**56**	**29**	**82**	**17**	**22**	**12**	**17**
UNWEIGHTED SAMPLE SIZE (#)	**108**	**53**	**15**	**40**	**38**	**70**	**24**	**38**	**46**	**33**	**61**	**71**	**37**	**40**	**55**	**29**	**51**	**57**	**28**	**80**	**16**	**21**	**12**	**17**
TOP 3 (8-10)	34	32	16	41	40	30	24	19	52	30	37	36	30	31	34	43	68	0	71	20	25	36	46	32
MID 4 (4-7)	38	48	25	30	42	35	54	45	22	35	39	33	47	34	39	37	32	43	27	42	43	36	22	36
BOTTOM 4 (0-3)	29	20	59	29	18	35	22	36	27	35	24	31	23	35	27	20	0	57	3	38	32	29	33	32
MEAN	5.6	5.9	3.9	5.7	6.3	5.1	5.5	4.7	6.4	4.8	6.0	5.6	5.6	5.5	5.7	6.3	8.6	2.6	8.0	4.7	5.4	5.6	5.7	5.6

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 33_9:

Before today, how familiar were you with:

Outdoor Motion Sensors

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
10 - Completely familiar	30	23	19	42	29	31	28	32	30	34	29	34	25	27	33	32	47	0	41	27	29	43	26	32
9	8	10	7	6	3	11	3	4	15	10	6	10	4	10	6	11	12	0	9	7	6	3	15	22
8	16	10	31	18	30	6	28	13	8	17	17	15	18	19	14	18	25	0	37	10	18	15	3	19
7	10	8	18	10	16	6	5	13	12	9	11	13	5	11	10	9	16	0	3	12	10	17	28	0
6	5	6	6	4	5	6	2	10	3	4	5	5	6	6	6	8	0	15	6	5	5	0	7	12
5	12	17	13	7	9	15	11	8	18	11	15	12	13	14	10	9	0	34	0	16	21	7	7	10
4	4	6	7	1	1	7	6	6	1	5	3	3	6	6	5	0	0	12	0	5	6	0	3	5
3	3	4	0	1	0	4	2	2	4	0	3	0	6	1	2	6	0	7	0	3	0	0	0	0
2	4	6	0	2	3	4	3	0	7	0	6	4	4	0	4	6	0	10	0	5	0	11	0	0
1	3	5	0	2	4	2	0	9	0	6	2	0	8	4	4	0	0	8	0	4	0	0	0	0
0 - Completely unfamiliar	5	6	0	6	0	7	11	3	2	4	4	4	6	1	6	2	0	14	3	6	6	3	10	0
WEIGHTED SAMPLE SIZE (#)	**132**	**61**	**16**	**55**	**54**	**76**	**39**	**45**	**47**	**39**	**83**	**80**	**52**	**50**	**90**	**33**	**84**	**48**	**30**	**102**	**23**	**25**	**15**	**17**
UNWEIGHTED SAMPLE SIZE (#)	**133**	**64**	**15**	**54**	**52**	**80**	**32**	**45**	**56**	**35**	**86**	**84**	**49**	**50**	**90**	**35**	**85**	**48**	**28**	**105**	**22**	**27**	**17**	**18**
TOP 3 (8-10)	54	43	56	66	62	48	60	49	53	61	51	58	47	56	53	61	84	0	87	44	53	62	45	73
MID 4 (4-7)	32	37	44	23	31	33	24	37	34	30	34	34	29	38	31	25	16	61	10	38	41	24	45	27
BOTTOM 4 (0-3)	14	20	0	11	7	18	16	14	13	10	15	8	24	6	15	14	0	39	3	18	6	14	10	0
MEAN	7.0	6.3	7.5	7.6	7.6	6.6	6.7	6.9	7.2	7.3	6.9	7.5	6.2	7.3	6.9	7.4	8.9	3.6	8.5	6.5	7.1	7.6	7.1	8.1

This question was randomly posed to approximately one in nine respondents.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 34A:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[15] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	37	33	48	37	38	35	39	36	36	44	35	34	42	32	35	28	42	32	46	33	33	37	26	37
No	63	67	52	63	62	65	61	64	64	56	65	66	58	68	65	72	58	68	54	67	67	63	74	63
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

TABLE 34B:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[25] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	50	47	61	48	52	46	49	53	48	51	50	50	50	47	49	42	55	45	59	46	46	53	47	52
No	50	53	39	52	48	54	51	47	52	49	50	50	50	53	51	58	45	55	41	54	54	47	53	48
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

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TABLE 34C:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[35] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	56	55	61	55	59	53	56	61	53	57	57	57	55	55	54	49	61	52	67	52	54	60	57	56
No	44	45	39	45	41	47	44	39	47	43	43	43	45	45	46	51	39	48	33	48	46	40	43	44
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

TABLE 34D:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[45] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	63	65	63	60	65	60	67	65	57	62	65	63	62	60	63	59	66	60	72	59	63	67	59	60
No	37	35	37	40	35	40	33	35	43	38	35	37	38	40	37	41	34	40	28	41	37	33	41	40
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

NAVIGANT

2019 Electricity Usage Surveys - Residential

TABLE 34E:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[55] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	69	70	70	66	71	66	71	72	64	63	73	69	67	65	70	69	72	66	81	64	76	73	63	63
No	31	30	30	34	29	34	29	28	36	37	27	31	33	35	30	31	28	34	19	36	24	27	37	37
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

TABLE 34F:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[65] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	73	74	80	70	74	72	78	77	67	67	77	74	70	70	76	74	77	70	83	70	80	80	65	71
No	27	26	20	30	26	28	22	23	33	33	23	26	30	30	24	26	23	30	17	30	20	20	35	29
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

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TABLE 34G:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[75] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	80	82	87	77	81	80	85	83	75	76	84	82	77	78	83	83	85	77	87	78	87	86	78	77
No	20	18	13	23	19	20	15	17	25	24	16	18	23	22	17	17	15	23	13	22	13	14	22	23
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

TABLE 34H:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[85] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	83	84	89	80	83	83	87	86	78	77	86	85	79	81	85	88	88	79	91	80	90	87	86	78
No	17	16	11	20	17	17	13	14	22	23	14	15	21	19	15	12	12	21	9	20	10	13	14	22
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

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TABLE 34I:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your home, but changes the amount of energy consumed. An example might be [ITEM SEEN IN Q33].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $75 if the project saved $[95] per year?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	86	88	90	83	86	86	90	88	81	82	88	88	82	84	88	92	89	83	93	84	92	90	91	80
No	14	12	10	17	14	14	10	12	19	18	12	12	18	16	12	8	11	17	7	16	8	10	9	20
WEIGHTED SAMPLE SIZE (#)	**511**	**220**	**75**	**215**	**268**	**241**	**147**	**160**	**204**	**134**	**338**	**343**	**167**	**215**	**300**	**144**	**245**	**266**	**139**	**371**	**98**	**91**	**58**	**82**
UNWEIGHTED SAMPLE SIZE (#)	**504**	**234**	**68**	**202**	**244**	**258**	**118**	**164**	**222**	**122**	**342**	**346**	**158**	**215**	**294**	**149**	**243**	**261**	**133**	**371**	**102**	**90**	**59**	**80**

This table excludes those who responded 'Don't know' to any of Q34a-i.

TABLE 36A:

Including yourself, how many household members live in your home?

Number of adults 18 or older

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
1	26	26	25	27	24	28	24	25	28	36	23	20	40	24	26	15	25	28	28	26	18	17	16	29
2	55	54	55	57	56	55	53	52	60	46	59	63	40	52	57	67	57	54	54	56	65	65	67	58
3	13	16	13	11	15	12	16	16	10	12	13	13	12	17	11	14	14	13	13	13	13	12	14	11
4 or more	5	4	7	5	6	4	7	7	3	5	5	4	7	7	6	4	5	5	6	5	4	7	3	3
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	2.0	2.0	2.0	2.0	2.1	1.9	2.1	2.1	1.9	1.9	2.0	2.0	1.9	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	1.9

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TABLE 36B:

Including yourself, how many household members live in your home?

Number of children under age of 18

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
None (0)	76	75	74	78	75	76	63	60	95	78	74	74	79	77	72	76	75	76	70	77	61	77	83	78
1	12	14	12	11	14	10	21	17	4	12	13	11	15	12	15	12	12	13	17	11	18	8	8	9
2	9	8	9	9	9	9	12	16	1	6	11	11	4	8	9	9	10	8	11	8	12	12	8	11
3	2	3	4	2	2	3	3	5	0	2	3	4	0	2	3	3	3	2	2	3	8	3	1	2
4 or more	1	0	1	1	0	1	1	1	0	2	0	0	2	1	1	0	0	1	1	1	1	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**
MEAN	1.7	1.6	1.8	1.7	1.5	1.8	1.6	1.8	1.3	1.7	1.7	1.7	1.5	1.7	1.6	1.6	1.7	1.6	1.6	1.7	1.8	1.7	1.6	1.7

TABLE 37A:

[IF Q36A AND Q36B TOTAL 1] Was your household income before taxes last year below $21,822?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	31	24	35	39	29	33	29	37	30	100	0	25	38	29	32	28	27	35	34	31	7	41	25	23
No	59	67	56	52	62	57	69	57	57	0	100	67	52	57	63	66	63	56	49	62	78	59	70	67
Prefer not to say	7	8	6	6	7	6	2	6	8	0	0	6	7	9	5	6	6	7	10	6	14	0	0	5
Don't know/Not sure	3	2	4	3	1	4	0	0	5	0	0	3	3	5	0	0	3	2	6	1	0	0	6	4
WEIGHTED SAMPLE SIZE (#)	**230**	**104**	**31**	**95**	**93**	**136**	**47**	**65**	**118**	**72**	**136**	**114**	**115**	**90**	**125**	**32**	**96**	**133**	**54**	**176**	**24**	**25**	**19**	**41**
UNWEIGHTED SAMPLE SIZE (#)	**226**	**109**	**28**	**89**	**86**	**140**	**41**	**62**	**123**	**71**	**133**	**110**	**116**	**92**	**120**	**31**	**97**	**129**	**51**	**175**	**25**	**20**	**18**	**41**

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TABLE 37B:

[IF Q36A AND Q36B TOTAL 2-4] Was your household income before taxes last year below $40,548?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	24	15	32	30	24	24	36	19	21	100	0	21	34	27	24	15	25	23	20	25	14	16	15	37
No	65	71	63	59	68	63	53	74	66	0	100	70	51	62	68	75	65	65	72	63	80	77	68	56
Prefer not to say	8	10	5	7	5	11	5	7	11	0	0	7	10	8	7	10	8	8	6	8	5	6	15	4
Don't know/Not sure	3	3	1	4	3	3	7	1	2	0	0	2	6	4	1	0	2	4	1	3	1	1	2	3
WEIGHTED SAMPLE SIZE (#)	**719**	**309**	**101**	**308**	**361**	**355**	**178**	**227**	**313**	**173**	**467**	**525**	**193**	**305**	**412**	**215**	**331**	**388**	**153**	**566**	**128**	**138**	**118**	**110**
UNWEIGHTED SAMPLE SIZE (#)	**724**	**336**	**94**	**294**	**344**	**377**	**146**	**237**	**341**	**158**	**485**	**539**	**185**	**309**	**419**	**225**	**333**	**391**	**153**	**571**	**130**	**144**	**127**	**107**

TABLE 37C:

[IF Q36A AND Q36B TOTAL 5 OR MORE] Was your household income before taxes last year below $57,747?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	29	14	32	46	19	35	31	29	24	100	0	17	48	34	26	38	39	20	27	30	0	17	39	26
No	66	81	60	54	77	61	69	67	39	0	100	76	52	62	68	53	61	72	66	67	92	68	61	74
Prefer not to say	2	0	8	0	5	0	0	0	37	0	0	3	0	0	3	9	0	4	7	0	0	15	0	0
Don't know/Not sure	2	5	0	0	0	4	0	3	0	0	0	4	0	4	3	0	0	4	0	3	8	0	0	0
WEIGHTED SAMPLE SIZE (#)	**54**	**22**	**13**	**19**	**22**	**30**	**17**	**33**	**3**	**16**	**36**	**32**	**21**	**28**	**35**	**11**	**27**	**27**	**14**	**40**	**15**	**7**	**5**	**4**
UNWEIGHTED SAMPLE SIZE (#)	**52**	**19**	**13**	**20**	**20**	**31**	**15**	**34**	**3**	**17**	**33**	**32**	**20**	**27**	**34**	**12**	**28**	**24**	**14**	**38**	**14**	**6**	**5**	**5**

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TABLE 38:

Do you live within a First Nations Community?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Yes	2	2	4	1	2	2	5	1	1	6	1	3	1	2	3	2	3	1	5	1	5	1	0	2
No	96	95	95	97	95	97	91	97	98	91	98	97	95	96	95	97	96	96	93	97	93	98	100	96
Prefer not to say	1	1	0	1	1	0	1	1	0	1	0	0	1	0	1	1	1	1	1	1	0	1	0	0
Don't know/Not sure	1	1	1	1	1	1	4	1	0	3	0	0	2	1	1	0	0	2	0	1	1	0	0	1
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

TABLE 39:

What is the main source of energy used to heat your principal place of residence?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Electricity	33	39	27	29	34	32	49	34	24	32	36	28	44	8	58	19	31	35	33	34	44	39	13	13
Oil	31	29	46	28	30	32	18	31	38	34	29	34	24	74	13	12	34	29	29	32	16	22	44	57
Heat pump/Mini-split heat pump	16	14	12	19	15	17	8	16	20	11	18	21	7	9	16	61	17	15	19	15	25	20	29	12
Wood/pellets	9	2	9	16	9	9	11	11	6	11	8	12	3	9	9	3	9	9	8	9	7	15	11	13
Natural gas	4	8	1	0	4	3	3	2	5	2	4	1	8	0	1	3	4	3	5	3	5	0	0	1
Propane	2	1	1	2	2	1	2	3	0	3	1	2	2	0	2	0	2	1	3	1	1	2	1	3
Solar	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	2	1	4	2	2	2	2	1	3	3	2	2	3	1	1	1	2	2	3	2	1	1	2	3
Don't know/Not sure	3	5	0	3	3	4	7	2	3	4	2	0	9	0	0	0	2	5	1	4	2	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

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TABLE 40:

[IF Q39 NOT 'Don't know/Not sure'] What other types of heating, if any, do you currently have for your principal place of residence? Please select all that apply.

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Electricity	26	21	25	30	24	27	17	29	27	25	26	30	16	22	43	41	28	23	28	25	30	31	27	31
Wood/pellets	16	9	19	22	17	15	12	15	19	13	16	21	5	14	15	26	19	14	20	15	15	24	28	19
Oil	12	8	12	15	12	11	14	11	11	12	11	13	8	26	8	19	11	12	12	11	11	9	16	17
Heat pump/Mini-split heat pump	10	10	10	11	12	9	11	9	11	7	12	12	6	11	11	39	11	9	16	9	19	10	13	7
Propane	6	7	9	3	7	6	7	5	6	5	7	6	5	5	7	7	7	5	9	5	13	8	0	3
Natural gas	2	3	1	0	3	0	5	1	0	3	1	1	2	1	2	2	2	1	4	1	6	0	0	0
Solar	1	1	1	1	2	1	2	1	1	1	2	1	1	2	2	2	1	2	3	1	2	1	2	1
Other	1	2	1	0	1	2	1	2	0	2	1	1	0	1	1	1	1	1	1	1	2	2	2	1
None – no other type of heating is used in my home	38	43	37	32	36	39	41	35	38	40	37	30	55	37	29	3	34	41	28	40	26	28	31	34
Don't know/Not sure	3	6	2	0	1	5	7	2	1	5	2	1	8	1	3	1	1	5	2	3	2	1	0	1
WEIGHTED SAMPLE SIZE (#)	**968**	**412**	**145**	**411**	**463**	**502**	**225**	**321**	**422**	**251**	**628**	**669**	**299**	**423**	**572**	**258**	**447**	**521**	**218**	**750**	**164**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**970**	**439**	**135**	**396**	**439**	**528**	**189**	**329**	**452**	**235**	**640**	**679**	**291**	**428**	**573**	**268**	**452**	**518**	**215**	**755**	**167**	**170**	**150**	**153**

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2019 Electricity Usage Surveys - Residential

TABLE 39+40:

What is the main source of energy used to heat your principal place of residence?

[IF Q39 NOT 'Don't know/Not sure'] What other types of heating, if any, do you currently have for your principal place of residence? Please select all that apply.

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Electricity	58	59	51	58	57	58	65	62	50	57	61	57	59	30	100	60	58	57	60	57	73	69	41	43
Oil	42	36	57	43	42	43	31	42	49	45	40	47	32	100	22	32	45	40	41	42	27	31	60	74
Heat pump/Mini-split heat pump	26	23	22	30	26	26	18	25	31	18	30	33	12	19	27	100	28	24	35	23	44	30	42	18
Wood/pellets	24	11	28	37	26	23	22	25	25	24	24	33	8	23	24	29	28	22	27	24	22	39	38	31
Propane	7	8	11	5	9	6	8	8	6	7	8	8	6	5	8	8	9	6	12	6	14	10	2	6
Natural gas	5	11	2	0	7	3	8	3	5	5	5	3	10	1	3	4	6	4	9	4	11	0	0	1
Solar	1	1	1	1	2	1	2	1	1	1	2	1	1	2	2	2	1	1	3	1	2	1	2	1
Other	3	3	4	2	2	3	3	3	3	4	2	3	3	2	1	1	3	3	4	3	2	3	3	3
Don't know/Not sure	3	5	0	3	3	4	7	2	3	4	2	0	9	0	0	0	2	5	1	4	2	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

TABLE 41:

[IF Q39 OR Q40 'Electricity] What type of electric heating does your residence use?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Electric Baseboards (e.g., small electric heaters, places throughout your building, typically under windows)	66	65	68	66	65	66	60	72	63	62	68	67	63	48	66	56	62	69	52	70	60	78	69	61
Ductless/Mini-Split Heat Pump (i.e., a heat pump system that has an indoor unit placed on a wall, that typically only heats a small area of the building)	6	6	1	8	7	5	6	6	7	6	7	8	2	7	6	20	9	4	14	4	11	7	10	4
Electric Resistance Boiler (i.e., a central furnace which uses an electric heating element and distributes heat through hot water, to your floor or radiators)	5	7	7	3	5	6	7	3	5	7	4	4	7	4	5	7	4	6	6	5	9	1	2	3
Electric Resistance Furnace (i.e., a central furnace which uses an electric heating element and distributes heat through forced-air)	4	7	2	2	4	4	9	3	1	4	4	3	6	9	4	0	5	3	8	3	4	0	3	3
Central Air-Source Heat Pump (i.e., a central heat pump system that heats all or most of the building, through distributed hot water or hot air)	4	4	4	4	5	3	3	3	5	3	4	4	4	3	4	9	6	2	5	3	6	2	1	4
Ground-Source Heat Pump (i.e., a central heat pump that collects heat from tubes in the ground outside of your building)	0	1	0	0	0	1	2	0	0	0	0	0	1	1	0	0	0	1	0	1	1	0	0	0
Other	7	4	9	10	7	8	2	7	11	10	6	9	5	14	7	6	10	6	12	6	5	7	12	15
Don't know/Not sure	7	7	9	8	7	8	11	6	7	9	6	5	13	13	7	2	4	10	4	9	4	4	2	8

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2019 Electricity Usage Surveys - Residential

TABLE 41:

[IF Q39 OR Q40 'Electricity] What type of electric heating does your residence use?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
WEIGHTED SAMPLE SIZE (#)	**577**	**256**	**74**	**247**	**274**	**300**	**157**	**203**	**217**	**148**	**388**	**384**	**193**	**126**	**572**	**155**	**263**	**314**	**133**	**445**	**122**	**116**	**58**	**67**
UNWEIGHTED SAMPLE SIZE (#)	**579**	**270**	**69**	**240**	**260**	**316**	**134**	**206**	**239**	**142**	**392**	**395**	**184**	**134**	**573**	**163**	**272**	**307**	**131**	**448**	**120**	**118**	**67**	**68**

TABLE 42:

[IF Q5 'Owned'] And approximately how many years old is your home?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
20 years or less	25	36	13	20	25	25	35	29	19	14	29	25	0	14	32	33	22	27	27	24	100	0	0	0
21-35 years	25	27	20	25	28	22	24	30	22	23	27	25	0	17	31	24	27	23	20	27	0	100	0	0
36-50 years	21	19	19	24	20	23	9	16	28	17	21	21	0	27	15	27	22	20	19	22	0	0	100	0
51 or more years	23	13	40	25	23	23	23	19	26	36	20	23	0	36	17	13	23	23	28	22	0	0	0	100
Don't know/Not sure	6	4	8	6	4	8	8	6	4	9	4	6	0	7	6	3	5	6	5	6	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**672**	**255**	**116**	**302**	**323**	**349**	**104**	**226**	**342**	**142**	**470**	**672**	**0**	**318**	**380**	**218**	**323**	**350**	**160**	**512**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**681**	**275**	**110**	**296**	**315**	**365**	**88**	**232**	**361**	**135**	**480**	**681**	**0**	**327**	**391**	**224**	**327**	**354**	**162**	**519**	**169**	**170**	**150**	**153**
MEAN	42.5	32.9	53.9	46.4	41.6	43.4	37.3	38.3	46.6	55.1	38.5	42.5	.	53.7	36.0	34.9	44.1	40.9	46.1	41.3	12.2	28.9	43.8	88.3

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2019 Electricity Usage Surveys - Residential

TABLE 43:

Does your household pay for its own electricity or does someone else pay for it?

	OVERALL %	REGION			GENDER		AGE			LOW INCOME		HOME		HEATING TYPE(S)			INEXPENSIVE UPGRADES		EXPENSIVE UPGRADES		AGE OF HOME			
		HRM	Cape Breton	Other Mainland NS	Male	Female	18-34	35-54	55+	Yes	No	Own	Rent	Oil	Electricity	Heat pump	Familiar (7-10)	Unfamiliar (0-6)	Familiar (7-10)	Unfamiliar (0-6)	0-20 yrs	21-35 yrs	36-50 yrs	51+ yrs
Household pays for it	89	89	91	87	87	91	78	91	93	84	92	98	71	94	88	93	91	87	91	88	96	100	98	98
Someone else pays for it	10	10	8	11	12	9	19	8	6	14	7	2	26	6	11	7	8	11	8	10	4	0	2	2
Don't know/Not sure	1	1	1	2	1	1	3	1	0	1	1	0	4	0	1	0	1	1	0	1	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**1002**	**435**	**145**	**422**	**477**	**521**	**242**	**326**	**434**	**261**	**639**	**672**	**330**	**423**	**572**	**258**	**454**	**548**	**220**	**782**	**167**	**169**	**142**	**156**
UNWEIGHTED SAMPLE SIZE (#)	**1002**	**464**	**135**	**403**	**450**	**548**	**202**	**333**	**467**	**246**	**651**	**681**	**321**	**428**	**573**	**268**	**458**	**544**	**218**	**784**	**169**	**170**	**150**	**153**

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2019 Electricity Usage Surveys - Business

TABLE 1:

Please indicate in which of the following areas your business is located. If your business has multiple locations, please indicate the location at which you work specifically.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Halifax Regional Municipality (HRM)	61	100	0	0	64	59	49	47	84	47	65	75	48	64	58
Elsewhere on Mainland Nova Scotia outside HRM	28	0	0	100	25	28	38	40	9	38	27	13	38	25	29
Cape Breton Island	11	0	100	0	11	13	13	13	7	16	8	13	14	11	13
SAMPLE SIZE (#)	**200**	**121**	**22**	**57**	**110**	**78**	**53**	**53**	**45**	**45**	**63**	**40**	**63**	**111**	**45**

This and all subsequent questions were optional.

TABLE 3:

For the remainder of the survey, please think about the business location where you personally work. Do you currently own, lease, or rent the premises at your business' Nova Scotia location where you work?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Own	59	60	55	56	100	0	57	55	60	56	61	62	61	60	75
Lease	17	16	32	12	0	41	11	22	21	11	19	22	12	15	9
Rent	24	23	14	32	0	59	32	22	19	33	19	16	27	26	16
SAMPLE SIZE (#)	**188**	**116**	**22**	**50**	**110**	**78**	**53**	**49**	**43**	**45**	**62**	**37**	**59**	**109**	**44**

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2019 Electricity Usage Surveys - Business

TABLE 4:

How many electrical power bars do you have at your business' Nova Scotia location where you work? A power bar is a block of electrical sockets that attaches to the end of a flexible cable allowing multiple electrical devices to be powered from a single electrical socket.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	6	2	14	11	4	7	6	6	0	5	2	6	6	2	5
1	10	9	0	20	10	12	19	6	3	19	7	3	13	5	14
2	12	13	14	9	13	12	17	10	8	17	17	6	8	14	14
3	10	10	19	7	14	6	19	8	5	21	7	3	8	13	11
4	7	6	10	9	9	4	9	4	13	12	2	9	11	10	5
5	7	8	0	9	5	10	15	8	3	12	12	0	8	9	9
6-10	20	18	24	22	17	22	9	40	5	12	26	14	25	21	23
11 or more	27	34	19	15	27	25	6	17	63	2	28	60	23	26	20
SAMPLE SIZE (#)	**172**	**105**	**21**	**46**	**99**	**67**	**47**	**48**	**38**	**42**	**58**	**35**	**53**	**96**	**44**
MEAN	14.5	18.7	11.5	6.7	14.2	12.4	5.8	8.0	29.3	3.9	13.3	33.1	11.7	14.7	11.7

Responses of greater than 225 were excluded from calculation of the mean.

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2019 Electricity Usage Surveys - Business

TABLE 5:

[IF Q4 1 OR MORE] Of this/these [Q4 RESPONSE] power bar(s), how many are smart power bars, that is, can be controlled via smart phone or computer or turn off automatically when you leave the room?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	83	83	67	93	82	84	86	91	71	90	79	76	76	80	83
1	3	4	0	2	1	6	0	4	3	0	4	3	6	4	2
2	4	4	6	5	6	2	9	2	3	5	7	3	6	5	7
3	2	1	17	0	2	3	0	2	3	3	4	0	4	2	0
4	1	0	6	0	1	0	2	0	0	3	0	0	0	1	0
5	2	3	0	0	3	0	0	0	8	0	5	0	0	2	2
6-10	2	3	0	0	2	2	0	0	8	0	2	6	4	2	2
11 or more	2	3	6	0	2	3	2	0	5	0	0	12	4	3	2
SAMPLE SIZE (#)	**162**	**103**	**18**	**41**	**95**	**62**	**44**	**45**	**38**	**40**	**57**	**33**	**50**	**94**	**42**
MEAN	.8	.8	2.5	.1	.8	.9	.3	.2	2.7	.3	.7	2.5	1.3	.9	.5

Responses of greater than 30 were excluded from calculation of the mean.

TABLE 4+5 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q4. How many electrical power bars do you have at your business' Nova Scotia location where you work? A power bar is a block of electrical sockets that attaches to the end of a flexible cable allowing multiple electrical devices to be powered from a single electrical socket.
Q5. [IF Q4 1 OR MORE] Of this/these [Q4 RESPONSE] power bar(s), how many are smart power bars, that is, can be controlled via smart phone or computer or turn off automatically when you leave the room?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion smart	6	4	19	2	6	6	7	2	10	7	5	8	12	6	5
SAMPLE SIZE (#)	**158**	**99**	**18**	**41**	**93**	**60**	**43**	**45**	**36**	**40**	**57**	**29**	**49**	**90**	**41**

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2019 Electricity Usage Surveys - Business

TABLE 6:

How many computer servers does your business have onsite at your business' Nova Scotia location where you work? There may be many servers on a single rack, but we want to know the number of individual servers.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	22	22	10	26	22	23	32	11	14	32	16	9	25	14	20
1	35	31	40	43	38	33	43	46	27	32	42	32	38	40	29
2	12	13	10	13	12	14	11	13	11	20	11	3	9	12	17
3	6	6	0	9	8	5	2	11	5	5	11	0	5	5	7
4	2	3	5	0	2	3	2	4	3	2	2	6	4	2	5
5	4	4	5	2	1	8	4	0	8	2	2	9	4	2	0
6 or more	18	21	30	7	18	14	6	15	32	7	18	41	15	24	22
SAMPLE SIZE (#)	**161**	**95**	**20**	**46**	**93**	**64**	**47**	**46**	**37**	**41**	**57**	**34**	**55**	**92**	**41**
MEAN	6.4	8.5	4.5	2.9	6.8	5.3	1.4	5.7	13.7	2.9	6.5	13.1	5.0	7.6	7.4

Responses of greater than 100 were excluded from calculation of the mean.

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2019 Electricity Usage Surveys - Business

TABLE 7:

[IF Q6 1 OR MORE] Of this/these [Q6 RESPONSE] server(s), how many use server virtualization and decommissioning? Server virtualization is a way of reducing the number of physical computer servers by running multiple, independent operating systems on a single server.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	55	51	39	71	49	61	69	63	28	64	44	45	59	56	39
1	21	16	33	24	25	16	9	29	28	21	29	13	20	16	27
2	6	9	0	3	5	8	13	2	0	7	10	0	0	6	12
3	4	1	17	3	5	2	6	0	3	7	2	6	7	3	3
4	1	1	0	0	0	2	0	0	3	0	2	0	0	1	0
5	3	4	6	0	4	2	0	2	9	0	2	10	2	3	6
6 or more	10	16	6	0	11	8	3	2	28	0	10	26	12	15	12
SAMPLE SIZE (#)	**126**	**74**	**18**	**34**	**73**	**49**	**32**	**41**	**32**	**28**	**48**	**31**	**41**	**79**	**33**
MEAN	2.5	3.7	1.7	.4	3.2	1.5	.7	1.2	6.9	.6	2.9	5.2	2.4	3.1	2.2

Responses of greater than 65 were excluded from calculation of the mean.

TABLE 6+7 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q6. How many computer servers does your business have onsite at your business' Nova Scotia location where you work? There may be many servers on a single rack, but we want to know the number of individual servers.
Q7. [IF Q6 1 OR MORE] Of this/these [Q6 RESPONSE] server(s), how many use server virtualization and decommissioning? Server virtualization is a way of reducing the number of physical computer servers by running multiple, independent operating systems on a single server.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion using virtualization	31	35	33	10	35	28	36	19	50	14	32	43	36	38	34
SAMPLE SIZE (#)	**122**	**70**	**18**	**34**	**71**	**48**	**32**	**41**	**28**	**28**	**46**	**29**	**41**	**75**	**32**

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2019 Electricity Usage Surveys - Business

TABLE 8:

How many hot water heaters do you have for your business' Nova Scotia location where you work?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	17	19	24	10	12	26	22	13	10	19	16	11	9	12	9
1	56	53	43	68	61	49	69	65	35	74	57	31	62	59	68
2	15	15	19	14	14	16	4	21	30	2	20	31	19	18	14
3 or more	11	13	14	8	13	9	6	2	25	5	7	26	10	11	9
SAMPLE SIZE (#)	**175**	**104**	**21**	**50**	**101**	**69**	**51**	**48**	**40**	**43**	**61**	**35**	**58**	**100**	**44**
MEAN	1.3	1.3	1.4	1.2	1.4	1.1	1.0	1.1	1.8	1.0	1.2	2.0	1.4	1.4	1.2

Responses of greater than 6 were excluded from calculation of the mean.

TABLE 9A-D (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

[IF Q8 '1' OR MORE] Of this/these [Q8 RESPONSE] how water heater(s), how many...

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Have a hot water heater tank wrap	38	47	13	33	39	40	53	31	38	64	51	27	45	46	29
Are heat pump water heaters	21	33	13	6	24	19	13	15	38	7	23	34	25	22	35
Are smart water heaters	11	14	27	2	13	8	6	5	21	4	9	18	11	8	16
Have a large duct for exhaust gas	8	14	0	2	10	6	6	5	15	0	9	16	12	12	12
SAMPLE SIZE (#)	**90**	**48**	**8**	**34**	**58**	**30**	**25**	**29**	**22**	**25**	**30**	**19**	**35**	**50**	**26**

This table excludes responses of 'Don't know'.

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TABLE 10A:

Thinking about your building for your business' Nova Scotia location where you work... Does your building...

Have open coolers, that is, coolers that do not have covers or doors?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	9	12	10	4	10	8	6	10	14	9	10	17	11	11	20
No	61	58	75	61	69	51	63	56	64	61	66	72	53	66	61
Not applicable	30	30	15	35	22	41	31	35	21	30	25	11	35	23	18
SAMPLE SIZE (#)	**182**	**108**	**20**	**54**	**102**	**74**	**52**	**52**	**42**	**44**	**61**	**36**	**62**	**104**	**44**

TABLE 10B:

Thinking about your building for your business' Nova Scotia location where you work... Does your building...

Have strategic energy management or organized management approach? This is the process of monitoring, controlling, and conserving energy within and organization in a systematic way.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	22	30	26	6	21	25	10	18	47	7	27	43	19	28	27
No	53	45	58	69	57	46	66	60	34	68	53	51	58	54	58
Not applicable	24	25	16	25	22	29	24	22	18	25	20	6	24	18	16
SAMPLE SIZE (#)	**174**	**104**	**19**	**51**	**101**	**69**	**50**	**50**	**38**	**44**	**59**	**35**	**59**	**101**	**45**

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TABLE 10C:

Thinking about your building for your business' Nova Scotia location where you work... Does your building...

Have Door heater controls such as anti-sweat heaters (ASH)? These are electric resistance heaters that are installed in the frames and doors of refrigerated cases to reduce condensation and prevent fogging. These are particularly common in grocery and convenience stores.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	13	17	15	2	14	10	8	12	23	11	14	22	12	14	22
No	64	57	70	76	66	59	66	70	56	67	66	69	63	67	62
Not applicable	24	26	15	22	20	31	26	18	21	22	20	8	25	19	16
SAMPLE SIZE (#)	**176**	**106**	**20**	**50**	**101**	**71**	**50**	**50**	**39**	**45**	**59**	**36**	**60**	**101**	**45**

TABLE 10D:

Thinking about your building for your business' Nova Scotia location where you work... Does your building...

Have a packaged terminal heat pump (PTHP)? A PTHP provides heating and cooling room by room often for applications common in hotels and motels.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	25	27	48	10	28	21	18	27	37	14	34	32	27	28	52
No	53	50	33	67	54	47	59	57	45	61	49	59	50	57	32
Not applicable	23	24	19	22	18	31	24	16	18	25	17	9	23	15	16
SAMPLE SIZE (#)	**175**	**105**	**21**	**49**	**101**	**70**	**51**	**49**	**38**	**44**	**59**	**34**	**60**	**100**	**44**

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TABLE 10E:

Thinking about your building for your business' Nova Scotia location where you work... Does your building...

In your heating, cooling and ventilation systems, is the speed of any fans or pumps automatically controlled by a variable frequency drive (VFD)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	22	28	20	12	23	19	10	22	38	11	34	25	21	22	33
No	53	47	55	64	57	48	60	60	38	60	52	63	50	60	49
Not applicable	25	26	25	24	20	33	30	18	24	29	14	13	29	17	18
SAMPLE SIZE (#)	**168**	**98**	**20**	**50**	**99**	**67**	**50**	**45**	**37**	**45**	**56**	**32**	**58**	**98**	**45**

TABLE 11A:

[IF Q10A 'Yes', OR CODED AS ZERO IF Q10A 'No'] How many of each does your business have?

Open coolers, that is, coolers that do not have covers or doors?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	90	89	88	94	90	93	94	88	84	93	91	84	85	89	82
1	5	7	6	0	6	2	3	6	6	7	7	3	5	5	9
2	3	4	6	0	4	2	3	3	6	0	2	10	8	5	9
3 or more	2	0	0	6	0	2	0	3	3	0	0	3	3	1	0
SAMPLE SIZE (#)	**125**	**73**	**17**	**35**	**79**	**42**	**36**	**33**	**32**	**30**	**45**	**31**	**39**	**79**	**34**
MEAN	.3	.2	.2	.6	.1	.4	.1	.5	.4	.1	.1	.6	.4	.3	.3

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TABLE 11B:

[IF Q10C 'Yes', OR CODED AS ZERO IF Q10C 'No'] How many of each does your business have?

Door heater controls such as anti-sweat heaters (ASH)? These are electric resistance heaters that are installed in the frames and doors of refrigerated cases to reduce condensation and prevent fogging. These are particularly common in grocery and convenience stores.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	89	84	88	97	88	91	92	88	77	91	87	81	89	88	82
1	8	11	6	3	9	6	6	10	13	9	11	6	5	8	13
2	2	4	0	0	4	0	3	2	3	0	2	6	5	3	5
3 or more	2	1	6	0	0	2	0	0	6	0	0	6	2	3	0
SAMPLE SIZE (#)	**131**	**76**	**16**	**39**	**80**	**47**	**36**	**41**	**31**	**34**	**46**	**32**	**44**	**80**	**38**
MEAN	.2	.2	.5	.0	.2	.2	.1	.1	.5	.1	.2	.5	.3	.3	.2

TABLE 11C:

[IF Q10D 'Yes', OR CODED AS ZERO IF Q10D 'No'] How many of each does your business have?

Packaged terminal heat pumps (PTHP)? A PTHP provides heating and cooling room by room often for applications common in hotels and motels.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	76	77	50	87	73	80	82	73	67	87	69	73	77	75	44
1	14	17	13	8	16	11	10	15	20	13	17	13	12	12	25
2	6	6	19	0	7	4	5	7	10	0	10	7	5	8	22
3 or more	4	0	19	5	4	4	3	5	3	0	4	7	7	5	8
SAMPLE SIZE (#)	**131**	**77**	**16**	**38**	**81**	**46**	**39**	**41**	**30**	**31**	**48**	**30**	**43**	**83**	**36**
MEAN	.4	.3	1.2	.3	.5	.3	.4	.4	.5	.1	.4	.6	.6	.5	1.1

Responses of greater than 6 were excluded from calculation of the mean.

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TABLE 11D:

[IF Q10E 'Yes', OR CODED AS ZERO IF Q10E 'No'] How many of each does your business have?

Systems with variable frequency drive (VFD)? In your heating, cooling and ventilation systems, VFD automatically controls the speed of any fans or pumps.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	78	71	73	92	77	79	86	78	58	94	67	77	79	76	67
1	14	19	13	5	16	12	11	17	23	6	23	8	13	15	19
2	5	6	7	3	5	5	0	6	12	0	8	4	3	5	8
3 or more	3	4	7	0	3	5	3	0	8	0	2	12	5	4	6
SAMPLE SIZE (#)	**121**	**69**	**15**	**37**	**77**	**43**	**35**	**36**	**26**	**31**	**48**	**26**	**39**	**79**	**36**
MEAN	.4	.5	.6	.1	.4	.3	.3	.3	.8	.1	.4	.7	.4	.4	.6

Responses of greater than 6 were excluded from calculation of the mean.

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TABLE 13:

Approximately, how many motors does your business' HVAC, refrigeration equipment or appliances have?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	32	26	42	39	31	33	39	30	9	38	23	9	40	20	27
1	31	34	32	25	28	36	34	33	26	41	38	25	26	31	37
2	16	17	0	23	17	16	18	19	24	15	19	19	10	22	10
3 or more	21	24	26	14	24	16	9	19	41	5	19	47	24	26	27
SAMPLE SIZE (#)	**152**	**89**	**19**	**44**	**87**	**64**	**44**	**43**	**34**	**39**	**52**	**32**	**50**	**89**	**41**
MEAN	1.7	1.9	1.5	1.4	1.9	1.3	1.2	1.5	3.0	.9	1.5	3.5	1.7	2.2	2.2

Responses of greater than 10 were excluded from calculation of the mean.

TABLE 14:

[IF Q13 1 OR MORE] Of this/these motors, how many of your HVAC, refrigeration equipment, or appliances use EC Motors? EC Motors refer to an electronically commutated motor that uses electronic controls to vary its speed. They may be known as brushless DC motors.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	53	48	27	74	53	51	59	60	32	75	50	38	43	56	50
1	23	23	45	15	22	26	26	23	19	21	33	21	23	21	27
2	11	14	0	7	10	12	7	13	16	4	8	14	10	7	3
3 or more	13	15	27	4	15	12	7	3	32	0	10	28	23	15	20
SAMPLE SIZE (#)	**104**	**66**	**11**	**27**	**60**	**43**	**27**	**30**	**31**	**24**	**40**	**29**	**30**	**71**	**30**
MEAN	1.1	1.2	1.8	.5	1.2	1.0	.8	.6	2.0	.3	.9	1.9	1.6	1.1	1.4

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TABLE 13+14 (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Q13. Approximately, how many motors does your business' HVAC, refrigeration equipment or appliances have?
Q14. [IF Q13 1 OR MORE] Of this/these motors, how many of your HVAC, refrigeration equipment, or appliances use EC Motors? EC Motors refer to an electronically commutated motor that uses electronic controls to vary its speed. They may be known as brushless DC motors.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion using EC motors	43	46	71	23	42	52	42	29	60	19	46	49	55	42	46
SAMPLE SIZE (#)	**103**	**65**	**11**	**27**	**60**	**42**	**27**	**30**	**31**	**24**	**39**	**29**	**30**	**71**	**30**

TABLE 15A/16A (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Linear lighting (e.g. fluorescent or LED tubes) [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15A_1. Number of Non-LED Bulbs
Q15A_2. Number of LED Bulbs
Q16A. [IF Q15A_LED 1 OR MORE] Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	60	61	68	50	55	68	43	54	78	36	51	79	41	71	63
Proportion Internet connected	8	8	16	1	3	15	2	0	15	8	1	7	2	8	3
SAMPLE SIZE (#)	**86**	**54**	**10**	**22**	**46**	**37**	**20**	**29**	**23**	**17**	**33**	**21**	**27**	**51**	**24**

Responses of greater than 1,000 bulbs were excluded from this table.

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TABLE 15B/16B (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Pole mounted area lights which is exterior lighting generally used to provide illumination to areas for vehicle and pedestrian use, with light fixtures mounted to poles [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15B_1. Number of Non-LED Bulbs
Q15B_2. Number of LED Bulbs..

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	71	73	71	44	60	77	33	47	82	29	72	74	78	69	54
Proportion Internet connected	17	20	2	4	5	33	8	2	5	7	4	21	8	19	7
SAMPLE SIZE (#)	**51**	**32**	**7**	**12**	**34**	**14**	**11**	**19**	**14**	**7**	**22**	**14**	**15**	**35**	**22**

TABLE 15C/16C (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Track/Mono-point direction lights, which is a lighting system in which the lights are fitted on tracks, allowing variable positioning [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15C_1. Number of Non-LED Bulbs
Q15C_2. Number of LED Bulbs
Q16C. [IF Q15C_LED 1 OR MORE] Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	86	86	100	92	96	57	97	62	85	86	88	86	74	88	80
Proportion Internet connected	6	4	56	29	4	11	4	31	5	17	12	2	37	5	21
SAMPLE SIZE (#)	**38**	**27**	**4**	**7**	**25**	**12**	**13**	**8**	**15**	**9**	**15**	**11**	**11**	**32**	**11**

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TABLE 15D/16D (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Downlight luminaire which is a small spotlight set in a ceiling and directed downwards [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15D_1. Number of Non-LED Bulbs
Q15D_2. Number of LED Bulbs
Q16D. [IF Q15D_LED 1 OR MORE] Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	77	84	91	57	74	77	86	73	84	82	45	91	90	84	34
Proportion Internet connected	5	6	12	0	9	3	10	4	4	15	12	3	6	5	10
SAMPLE SIZE (#)	**39**	**21**	**5**	**13**	**22**	**15**	**11**	**12**	**11**	**8**	**13**	**12**	**10**	**25**	**19**

TABLE 15E/16E (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Flood lights, which areoutdoor fixture mounted on a building, structure, or ground. They are typically used to illuminate or highlight outdoor objects and features). [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15E_1. Number of Non-LED Bulbs
Q15E_2. Number of LED Bulbs
Q16E. [IF Q15E_LED 1 OR MORE] Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	74	77	88	47	72	78	73	36	81	82	80	76	55	86	84
Proportion Internet connected	15	14	14	18	9	25	6	8	22	10	22	16	26	10	17
SAMPLE SIZE (#)	**59**	**33**	**7**	**19**	**37**	**18**	**14**	**19**	**16**	**12**	**20**	**14**	**19**	**40**	**19**

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TABLE 15F/16F (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

General service lights (i.e. have a base sized like a normal light bulb and screw into regular light sockets) [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15F_1. Number of Non-LED Bulbs
Q15F_2. Number of LED Bulbs
Q16F. [IF Q15F_LED 1 OR MORE] Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	70	71	68	64	80	54	58	57	86	66	68	78	39	69	77
Proportion Internet connected	12	13	12	6	4	25	4	17	2	5	15	5	11	11	9
SAMPLE SIZE (#)	**82**	**51**	**9**	**22**	**52**	**29**	**33**	**22**	**17**	**24**	**29**	**14**	**25**	**53**	**25**

Responses of greater than 1,000 bulbs were excluded from this table.

TABLE 15G/16G (Responses shown as a proportion of the total number of specific items, and not of the number of respondents):

Parking garage lights [Proportions are shown as a percentage of total bulbs (LED + non-LED)]

Q15G_1. Number of Non-LED Bulbs
Q15G_2. Number of LED Bulbs
Q16G. [IF Q15G_LED 1 OR MORE] Of these LED light bulbs, how many are connected to the internet (i.e., smart lightbulbs)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Proportion LED	75	77	53	55	57	85	69	58	76	71	66	79	56	81	56
Proportion Internet connected	4	3	28	7	6	2	2	7	1	4	10	1	11	5	14
SAMPLE SIZE (#)	**52**	**38**	**3**	**11**	**32**	**19**	**13**	**12**	**19**	**11**	**18**	**18**	**14**	**36**	**13**

Responses of greater than 1,000 bulbs were excluded from this table.

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TABLE 17:

Approximately, how many occupancy sensors does your business' building/facility have? Occupancy sensors are motion detectors that will turn off lights when people are not present.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	71	69	78	73	68	74	82	82	50	78	67	63	76	69	63
1	6	5	0	12	6	7	4	4	8	13	8	3	4	7	12
2	7	4	11	12	11	3	10	10	5	8	12	0	4	9	9
3 or more	15	22	11	4	15	16	4	4	38	3	13	34	17	15	16
SAMPLE SIZE (#)	**170**	**101**	**18**	**51**	**95**	**69**	**51**	**49**	**40**	**40**	**60**	**35**	**54**	**99**	**43**
MEAN	2.2	3.2	1.1	.5	2.4	1.9	.4	.7	5.1	.4	2.0	5.7	1.0	2.3	2.1

Responses of greater than 50 were excluded from calculation of the mean.

TABLE 18:

How many rooms in your business' Nova Scotia location where you work have lighting fixtures that automatically turn off if there is sufficient sunlight coming into the building (i.e., daylighting controls)?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
None (0)	80	73	89	90	78	81	82	89	63	80	80	69	77	76	65
1	3	2	6	4	5	0	6	2	0	10	2	0	2	4	7
2	5	8	0	0	5	4	6	4	3	5	5	3	5	5	7
3 or more	13	17	6	6	12	14	6	6	34	5	13	28	16	14	21
SAMPLE SIZE (#)	**174**	**104**	**18**	**52**	**98**	**69**	**51**	**53**	**38**	**40**	**60**	**36**	**57**	**97**	**43**
MEAN	.8	1.2	.5	.3	1.0	.7	.4	.4	2.5	.4	.6	2.3	1.1	1.1	1.4

Responses of greater than 50 were excluded from calculation of the mean.

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2019 Electricity Usage Surveys - Business

TABLE 19:

Were any of your lighting systems commissioned? Lighting Commissioning involves a professional installing, calibrating and testing the lighting system controls to ensure they operate correctly.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	21	26	22	9	19	20	10	20	32	3	29	34	21	23	28
No	79	74	78	91	81	80	90	80	68	97	71	66	79	77	72
SAMPLE SIZE (#)	**160**	**95**	**18**	**47**	**93**	**64**	**49**	**44**	**38**	**39**	**58**	**32**	**52**	**91**	**43**

TABLE 20_1:

Before today, how familiar were you with:

IT load optimization strategy (Server refresh and virtualization) (A way of reducing the number of physical computer servers by running multiple, independent operating systems on a single server)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	4	6	0	0	6	0	0	9	0	14	0	0	13	0	14
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4	0	0	10	6	0	0	0	0	0	11	0	0	6	0
6	4	6	0	0	6	0	0	0	17	0	0	14	0	6	14
5	7	13	0	0	6	11	0	0	17	0	0	29	0	12	14
4	4	0	0	10	0	11	0	9	0	0	0	0	13	6	0
3	4	0	0	10	6	0	0	0	0	14	0	0	0	6	14
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	6	0	0	6	0	0	0	17	0	11	0	0	6	0
0 - Completely unfamiliar	70	69	100	70	67	78	100	82	50	71	78	57	75	59	43
SAMPLE SIZE (#)	**27**	**16**	**1**	**10**	**18**	**9**	**6**	**11**	**6**	**7**	**9**	**7**	**8**	**17**	**7**
TOP 3 (8-10)	4	6	0	0	6	0	0	9	0	14	0	0	13	0	14
MID 4 (4-7)	19	19	0	20	17	22	0	9	33	0	11	43	13	29	29
BOTTOM 4 (0-3)	78	75	100	80	78	78	100	82	67	86	89	57	75	71	57
MEAN	1.5	1.6	.0	1.4	1.7	1.0	.0	1.2	2.0	1.7	.9	2.3	1.6	1.8	3.3

This question was randomly posed to approximately one in seven respondents.

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TABLE 20_2:

Before today, how familiar were you with:

Heat pump water heater

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	15	29	0	0	25	8	14	29	0	0	43	0	33	14	25
7	4	7	0	0	8	0	0	14	0	0	14	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	15	14	20	13	8	17	29	0	0	13	0	25	17	21	0
4	4	0	20	0	0	8	0	14	0	0	14	0	0	7	0
3	7	7	20	0	0	17	0	0	0	0	0	25	0	14	0
2	7	0	0	25	0	17	0	14	0	25	0	0	17	14	0
1	7	7	20	0	8	0	14	0	0	13	0	0	0	7	25
0 - Completely unfamiliar	41	36	20	63	50	33	43	29	100	50	29	50	33	21	50
SAMPLE SIZE (#)	**27**	**14**	**5**	**8**	**12**	**12**	**7**	**7**	**3**	**8**	**7**	**4**	**6**	**14**	**4**
TOP 3 (8-10)	15	29	0	0	25	8	14	29	0	0	43	0	33	14	25
MID 4 (4-7)	22	21	40	13	17	25	29	29	0	13	29	25	17	29	0
BOTTOM 4 (0-3)	63	50	60	88	58	67	57	43	100	88	29	75	50	57	75
MEAN	2.8	3.8	2.6	1.1	3.1	2.7	2.7	4.1	.0	1.3	5.0	2.0	3.8	3.3	2.3

This question was randomly posed to approximately one in seven respondents.

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TABLE 20_3:

Before today, how familiar were you with:

Open to closed cooler conversion (doors or covers on coolers)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	3	5	0	0	5	0	0	0	11	0	0	14	9	5	11
9	3	5	0	0	5	0	0	0	0	0	0	0	9	0	0
8	10	14	0	0	5	20	0	0	22	14	25	0	9	15	22
7	10	14	0	0	15	0	0	25	11	14	13	14	0	10	22
6	3	5	0	0	0	10	0	0	11	0	13	0	0	5	0
5	6	5	0	13	10	0	0	0	0	14	0	0	18	5	11
4	6	5	0	13	5	10	17	0	0	0	13	0	9	5	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	0	50	13	5	10	17	25	0	14	13	0	0	5	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - Completely unfamiliar	52	48	50	63	50	50	67	50	44	43	25	71	45	50	33
SAMPLE SIZE (#)	**31**	**21**	**2**	**8**	**20**	**10**	**6**	**4**	**9**	**7**	**8**	**7**	**11**	**20**	**9**
TOP 3 (8-10)	16	24	0	0	15	20	0	0	33	14	25	14	27	20	33
MID 4 (4-7)	26	29	0	25	30	20	17	25	22	29	38	14	27	25	33
BOTTOM 4 (0-3)	58	48	100	75	55	60	83	75	44	57	38	71	45	55	33
MEAN	3.0	3.8	1.0	1.4	3.2	2.8	1.0	2.3	4.3	3.1	4.4	2.4	3.7	3.3	5.0

This question was randomly posed to approximately one in seven respondents.

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TABLE 20_4:

Before today, how familiar were you with:

Door heater control (These are electric resistance heaters that are installed in the frames and doors of refrigerated cases to reduce condensation and prevent fogging.)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	4	0	33	0	0	10	17	0	0	33	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	9	17	0	0	17	0	0	0	17	0	17	20	0	18	40
5	9	8	0	13	17	0	17	0	17	0	17	20	11	18	0
4	4	8	0	0	0	10	0	17	0	0	0	20	0	9	0
3	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0
2	13	8	33	13	8	20	17	17	17	0	33	0	0	18	20
1	4	8	0	0	0	10	0	0	17	0	0	20	0	9	0
0 - Completely unfamiliar	52	42	33	75	58	50	50	67	33	67	33	20	89	27	40
SAMPLE SIZE (#)	**23**	**12**	**3**	**8**	**12**	**10**	**6**	**6**	**6**	**3**	**6**	**5**	**9**	**11**	**5**
TOP 3 (8-10)	4	0	33	0	0	10	17	0	0	33	0	0	0	0	0
MID 4 (4-7)	22	33	0	13	33	10	17	17	33	0	33	60	11	45	40
BOTTOM 4 (0-3)	74	67	67	88	67	80	67	83	67	67	67	40	89	55	60
MEAN	1.9	2.3	3.3	.9	2.0	1.7	2.5	1.0	2.3	2.7	2.5	3.2	.6	2.8	2.8

This question was randomly posed to approximately one in seven respondents.

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TABLE 20_5:

Before today, how familiar were you with:

Packaged Terminal heat pump (A PTHP provides heating and cooling room by room often for applications such as hotels, motels, apartment buildings, offices, among others)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	8	7	0	11	7	13	11	20	0	17	14	0	0	8	33
9	4	0	50	0	7	0	11	0	0	0	0	20	13	0	0
8	8	7	50	0	7	13	0	0	17	0	14	20	13	17	17
7	4	7	0	0	0	13	0	0	17	0	14	0	0	8	0
6	8	7	0	11	0	25	22	0	0	17	0	0	25	8	0
5	4	7	0	0	7	0	0	0	17	0	14	0	0	8	0
4	4	7	0	0	7	0	0	0	0	0	0	0	0	0	0
3	8	14	0	0	13	0	11	0	17	17	0	20	0	8	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	0	0	11	7	0	11	0	0	17	0	0	13	0	0
0 - Completely unfamiliar	48	43	0	67	47	38	33	80	33	33	43	40	38	42	50
SAMPLE SIZE (#)	**25**	**14**	**2**	**9**	**15**	**8**	**9**	**5**	**6**	**6**	**7**	**5**	**8**	**12**	**6**
TOP 3 (8-10)	20	14	100	11	20	25	22	20	17	17	29	40	25	25	50
MID 4 (4-7)	20	29	0	11	13	38	22	0	33	17	29	0	25	25	0
BOTTOM 4 (0-3)	60	57	0	78	67	38	56	80	50	67	43	60	50	50	50
MEAN	3.2	3.3	8.5	1.9	2.9	4.6	3.9	2.0	3.8	3.3	4.3	4.0	3.8	3.9	4.7

This question was randomly posed to approximately one in seven respondents.

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TABLE 20_6:

Before today, how familiar were you with:

EC Motor for Refrigeration applications (An electronically commutated motor (EC Motor) is a motor that uses electronic controls to vary its speed. There are three types of EC motors: constant cfm, constant rpm, and constant torque)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	8	17	0	0	20	0	25	0	25	0	8	20	17	8	13
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	8	0	25	11	10	0	0	8	0	0	8	0	0	8	13
5	8	17	0	0	0	17	0	8	25	0	8	20	0	8	13
4	4	0	25	0	10	0	25	0	0	33	0	0	0	8	0
3	4	0	25	0	0	8	0	8	0	0	8	0	17	8	0
2	16	17	0	22	20	17	0	33	0	0	33	0	17	15	13
1	4	8	0	0	0	8	0	0	25	0	0	20	0	8	0
0 - Completely unfamiliar	48	42	25	67	40	50	50	42	25	67	33	40	50	38	50
SAMPLE SIZE (#)	**25**	**12**	**4**	**9**	**10**	**12**	**4**	**12**	**4**	**3**	**12**	**5**	**6**	**13**	**8**
TOP 3 (8-10)	8	17	0	0	20	0	25	0	25	0	8	20	17	8	13
MID 4 (4-7)	20	17	50	11	20	17	25	17	25	33	17	20	0	23	25
BOTTOM 4 (0-3)	72	67	50	89	60	83	50	83	50	67	75	60	83	69	63
MEAN	2.3	2.9	3.3	1.1	3.4	1.5	3.5	1.8	4.0	1.3	2.7	3.2	2.5	2.5	2.9

This question was randomly posed to approximately one in seven respondents.

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2019 Electricity Usage Surveys - Business

TABLE 20_7:

Before today, how familiar were you with:

Strategic energy management program (This involves processes that empower an organization to implement energy management actions and consistently achieve energy performance improvements)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	3	3	0	0	5	0	7	0	0	9	0	0	0	4	17
8	5	7	0	0	10	0	7	0	9	9	0	14	7	4	0
7	13	10	50	0	14	13	7	25	9	18	7	29	20	8	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	18	17	0	40	14	25	20	0	36	18	7	29	20	17	0
4	8	10	0	0	5	13	7	13	0	0	21	0	13	13	17
3	3	3	0	0	0	6	7	0	0	0	7	0	0	4	17
2	5	7	0	0	5	6	0	0	18	0	14	0	0	8	0
1	10	10	0	20	5	6	0	13	9	0	7	14	7	8	0
0 - Completely unfamiliar	36	33	50	40	43	31	47	50	18	45	36	14	33	33	17
SAMPLE SIZE (#)	**39**	**30**	**4**	**5**	**21**	**16**	**15**	**8**	**11**	**11**	**14**	**7**	**15**	**24**	**6**
TOP 3 (8-10)	8	10	0	0	14	0	13	0	9	18	0	14	7	8	17
MID 4 (4-7)	38	37	50	40	33	50	33	38	45	36	36	57	53	37	50
BOTTOM 4 (0-3)	54	53	50	60	52	50	53	63	45	45	64	29	40	54	33
MEAN	3.0	3.1	3.5	2.2	3.2	3.0	3.1	2.4	3.6	3.7	2.3	4.7	3.5	3.0	5.0

This question was randomly posed to approximately one in seven respondents.

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2019 Electricity Usage Surveys - Business

TABLE 23A:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[5,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	20	24	21	9	15	24	17	9	37	12	21	34	17	22	20
No	80	76	79	91	85	76	83	91	63	88	79	66	83	78	80
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

TABLE 23B:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[20,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	30	34	26	20	26	33	30	20	45	23	30	47	23	33	32
No	70	66	74	80	74	67	70	80	55	77	70	53	77	67	68
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

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2019 Electricity Usage Surveys - Business

TABLE 23C:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[35,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	37	41	37	27	33	41	34	34	50	33	39	53	32	41	34
No	63	59	63	73	67	59	66	66	50	67	61	47	68	59	66
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

TABLE 23D:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[50,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	49	52	53	41	45	52	40	55	61	42	51	63	49	53	51
No	51	48	47	59	55	48	60	45	39	58	49	38	51	47	49
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

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TABLE 23E:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[65,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	54	55	53	52	52	56	47	57	66	49	56	66	51	60	59
No	46	45	47	48	48	44	53	43	34	51	44	34	49	40	41
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

TABLE 23F:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[80,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	58	61	58	52	58	57	47	59	74	49	61	75	53	66	68
No	42	39	42	48	42	43	53	41	26	51	39	25	47	34	32
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

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2019 Electricity Usage Surveys - Business

TABLE 23G:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[95,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	66	67	68	64	68	62	55	64	87	58	68	84	57	75	78
No	34	33	32	36	32	38	45	36	13	42	32	16	43	25	22
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

TABLE 23H:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[110,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	71	72	68	70	73	67	64	70	89	58	81	88	64	79	88
No	29	28	32	30	27	33	36	30	11	42	19	13	36	21	12
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

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2019 Electricity Usage Surveys - Business

TABLE 23I:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed and MAY result in some inconvenience (for example, obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing or implementing a(n) [ITEM SEEN IN Q20].

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is $100,000 if the project saved $[125,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	73	73	79	73	75	70	66	75	92	63	84	88	70	83	90
No	27	27	21	27	25	30	34	25	8	37	16	13	30	17	10
SAMPLE SIZE (#)	**162**	**99**	**19**	**44**	**97**	**63**	**47**	**44**	**38**	**43**	**57**	**32**	**53**	**96**	**41**

TABLE 21_1:

Before today, how familiar were you with:

Networked/Connected lighting system

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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2019 Electricity Usage Surveys - Business

TABLE 21_2:

Before today, how familiar were you with:

LED linear replacement lamp (i.e., LED tube lamps)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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TABLE 21_3:

Before today, how familiar were you with:

Smart power bar (power bar that can be controlled via smart phone or computer or turn off automatically when you leave the room)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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TABLE 21_4:

Before today, how familiar were you with:

LED Pole/Arm-mounted luminaire (Exterior lighting generally used to provide illumination to areas for vehicle and pedestrian use, with light fixtures mounted to poles)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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2019 Electricity Usage Surveys - Business

TABLE 21_5:

Before today, how familiar were you with:

LED parking garage light

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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TABLE 21_6:

Before today, how familiar were you with:

Daylight dimming control

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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TABLE 21_7:

Before today, how familiar were you with:

LED track light (A lighting system in which the lights are fitted on tracks, allowing variable positioning)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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2019 Electricity Usage Surveys - Business

TABLE 21_8:

Before today, how familiar were you with:

Solid State (LED) recessed downlight (Small spotlight set in a ceiling and directed downwards)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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2019 Electricity Usage Surveys - Business

TABLE 21_9:

Before today, how familiar were you with:

LED flood light (which are downward lights with non-LED bulbs)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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2019 Electricity Usage Surveys - Business

TABLE 21_10:

Before today, how familiar were you with:

General service light (have a base sized like a normal light bulb and screw into regular light sockets)

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
10 - Completely familiar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
7	24	27	33	0	27	25	33	0	33	33	50	0	13	25	33
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	7	0	0	0	13	0	0	11	0	0	13	13	0	0
4	10	0	33	33	9	13	33	20	0	33	13	0	13	8	0
3	5	7	0	0	0	13	0	20	0	0	0	13	0	8	0
2	5	7	0	0	0	13	0	0	11	0	0	13	0	8	0
1	24	20	33	33	27	13	33	20	0	33	13	13	25	33	67
0 - Completely unfamiliar	24	27	0	33	36	0	0	40	33	0	25	38	25	8	0
SAMPLE SIZE (#)	**21**	**15**	**3**	**3**	**11**	**8**	**3**	**5**	**9**	**3**	**8**	**8**	**8**	**12**	**3**
TOP 3 (8-10)	5	7	0	0	0	13	0	0	11	0	0	13	13	8	0
MID 4 (4-7)	38	33	67	33	36	50	67	20	44	67	63	13	38	33	33
BOTTOM 4 (0-3)	57	60	33	67	64	38	33	80	44	33	38	75	50	58	67
MEAN	3.1	3.3	4.0	1.7	2.5	4.6	4.0	1.6	4.0	4.0	4.1	2.4	3.3	3.5	3.0

This question was randomly posed to approximately one in ten respondents.

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2019 Electricity Usage Surveys - Business

TABLE 22A:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[500] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	21	27	20	11	18	25	13	16	36	10	25	26	25	22	24
No	79	73	80	89	82	75	88	84	64	90	75	74	75	78	76
SAMPLE SIZE (#)	**164**	**97**	**20**	**47**	**98**	**63**	**48**	**43**	**39**	**41**	**55**	**35**	**52**	**98**	**42**

TABLE 22B:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[2,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	36	41	40	23	33	40	23	37	51	24	38	46	29	39	38
No	64	59	60	77	67	60	77	63	49	76	62	54	71	61	62
SAMPLE SIZE (#)	**164**	**97**	**20**	**47**	**98**	**63**	**48**	**43**	**39**	**41**	**55**	**35**	**52**	**98**	**42**

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TABLE 22C:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[3,500] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	51	56	50	43	50	52	38	51	69	41	55	57	40	59	57
No	49	44	50	57	50	48	63	49	31	59	45	43	60	41	43
SAMPLE SIZE (#)	**164**	**97**	**20**	**47**	**98**	**63**	**48**	**43**	**39**	**41**	**55**	**35**	**52**	**98**	**42**

TABLE 22D:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[5,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	62	63	60	60	62	60	52	60	79	46	69	69	50	69	71
No	38	37	40	40	38	40	48	40	21	54	31	31	50	31	29
SAMPLE SIZE (#)	**164**	**97**	**20**	**47**	**98**	**63**	**48**	**43**	**39**	**41**	**55**	**35**	**52**	**98**	**42**

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TABLE 22E:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[6,500] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	67	68	60	68	69	63	58	65	82	54	78	71	54	74	83
No	33	32	40	32	31	37	42	35	18	46	22	29	46	26	17
SAMPLE SIZE (#)	**164**	**97**	**20**	**47**	**98**	**63**	**48**	**43**	**39**	**41**	**55**	**35**	**52**	**98**	**42**

TABLE 22F:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[8,000] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	72	71	70	74	74	68	69	70	85	61	87	71	62	80	88
No	28	29	30	26	26	32	31	30	15	39	13	29	38	20	12
SAMPLE SIZE (#)	**164**	**97**	**20**	**47**	**98**	**63**	**48**	**43**	**39**	**41**	**55**	**35**	**52**	**98**	**42**

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TABLE 22G:

Suppose an energy efficiency project has NO impact on the QUALITY of lighting, heating, and cooling in your business, but changes the amount of energy consumed. An example might be installing or implementing a(n) [ITEM SEEN IN Q21].

Would you generally pursue an energy efficiency project where the cost to your business after utility rebates is $7,500 if the project saved $[9,500] per year?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes	75	76	75	74	78	72	71	73	90	66	88	80	69	84	90
No	25	24	25	26	22	28	29	27	10	34	13	20	31	16	10
SAMPLE SIZE (#)	**166**	**99**	**20**	**47**	**99**	**64**	**48**	**44**	**40**	**41**	**56**	**35**	**52**	**100**	**42**

TABLE 24:

How many full-time equivalent employees, including yourself, are currently working at your business location within Nova Scotia?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
1	13	12	18	11	16	10	36	0	0	32	5	3	12	13	11
2-5	15	12	24	18	13	19	43	0	0	35	7	6	19	16	8
6-15	22	17	6	38	23	19	21	42	0	8	36	9	27	21	38
16-75	27	26	35	27	23	32	0	58	22	16	33	35	27	24	24
More than 75	23	33	18	7	25	19	0	0	78	8	18	47	15	26	19
SAMPLE SIZE (#)	**151**	**89**	**17**	**45**	**83**	**62**	**53**	**53**	**45**	**37**	**55**	**34**	**52**	**90**	**37**
MEAN	155	187	54	131	147	90	3	19	508	20	162	192	142	110	51
MEDIAN	14	25	18	8	12	18	2	18	125	2	17	70	10	13	10

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TABLE 25:

Approximately, what is the square footage of your company's business property at the location where you work? Would you say…?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
1,000 square feet or less	18	15	12	28	16	22	45	2	3	60	0	0	24	16	8
More than 1,000 square feet up to 2,000 square feet	12	8	29	15	13	12	16	14	5	40	0	0	20	14	13
More than 2,000 square feet up to 5,000 square feet	21	20	24	23	22	21	16	42	5	0	49	0	22	20	25
More than 5,000 square feet, up to 10,000 square feet	22	25	6	21	22	21	14	23	31	0	51	0	8	23	35
More than 10,000 square feet, up to 25,000 square feet	14	15	18	8	12	16	5	12	23	0	0	50	12	13	13
More than 25,000 square feet	14	17	12	5	15	9	5	7	33	0	0	50	12	14	8
SAMPLE SIZE (#)	**148**	**92**	**17**	**39**	**86**	**58**	**44**	**43**	**39**	**45**	**63**	**40**	**49**	**93**	**40**

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TABLE 26:

Does your company pay for its own electricity at your business' Nova Scotia location where you work, or does someone else, such as a landlord pay for it?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Yes, pay for own	67	64	60	76	76	56	71	71	61	77	65	58	74	69	73
Head office or other department pays	23	28	25	12	20	23	12	20	34	5	25	36	19	25	20
No, landlord pays	10	8	15	10	4	20	18	6	5	16	10	6	7	7	7
Other	1	0	0	2	0	2	0	2	0	2	0	0	0	0	0
SAMPLE SIZE (#)	**168**	**98**	**20**	**50**	**101**	**61**	**51**	**49**	**38**	**44**	**60**	**36**	**58**	**102**	**44**

TABLE 26A:

[IF CODES 1 OR 2 IN Q26] Please select the electric utility provider that provides electricity at your business' Nova Scotia location where you work.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Nova Scotia Power Incorporated	97	98	100	93	96	98	93	96	100	94	96	97	96	96	95
Antigonish Electric Utility	2	2	0	2	2	2	2	4	0	3	2	3	4	2	5
Berwick Electric Light Commission	1	0	0	2	1	0	2	0	0	0	2	0	0	1	0
Lunenburg Electric Utility	1	0	0	2	1	0	2	0	0	3	0	0	0	1	0
SAMPLE SIZE (#)	**149**	**89**	**17**	**43**	**96**	**48**	**42**	**45**	**35**	**36**	**54**	**33**	**54**	**94**	**41**

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TABLE 27:

[IF Q26A 'Nova Scotia Power Incorporated'] Please select your business' rate code from the drop-down selection below. Your rate code can be found on your Nova Scotia Power bill.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
2	9	10	13	5	9	9	22	2	3	30	4	0	14	11	6
3	5	6	7	3	2	11	3	2	3	13	4	3	10	5	0
4M	7	5	13	11	8	7	6	7	9	10	12	3	4	11	6
4B	6	6	7	5	5	9	0	12	3	3	8	6	8	7	3
5	5	4	13	5	2	9	3	10	6	3	6	10	8	6	6
6	1	2	0	0	1	2	3	2	0	0	2	0	2	1	3
10M	7	7	13	3	6	9	6	5	9	0	4	16	4	5	11
10B	4	5	0	3	6	0	8	0	6	7	6	0	0	6	6
11M	2	2	0	3	2	2	3	2	3	3	2	3	0	2	0
11B	1	1	0	0	1	0	0	0	3	0	2	0	0	0	0
12M	1	0	7	0	1	0	0	2	0	0	2	0	0	0	3
12MTO	1	1	0	0	1	0	0	0	0	0	2	0	0	1	3
21M	1	2	0	0	2	0	0	0	6	0	0	3	2	2	3
22M	1	0	0	3	0	0	0	0	3	0	0	0	2	0	0
23M	1	1	0	0	1	0	0	0	3	0	0	3	2	1	0
999	1	0	0	3	0	2	0	2	0	0	2	0	0	1	3
Don't know/Not sure	47	46	27	58	51	39	47	52	41	30	43	52	44	40	50
SAMPLE SIZE (#)	**135**	**82**	**15**	**38**	**86**	**44**	**36**	**42**	**32**	**30**	**49**	**31**	**50**	**83**	**36**

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TABLE 27_2:

[IF Q26A NOT 'Nova Scotia Power Incorporated'] Please select your business' rate code from the drop-down selection below. Your rate code can be commonly found on your electricity bill.

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
General	67	100	0	0	67	0	50	100	0	50	0	100	100	50	100
Residential	33	0	0	100	33	0	50	0	0	50	0	0	0	50	0
SAMPLE SIZE (#)	**3**	**2**	**0**	**1**	**3**	**0**	**2**	**1**	**0**	**2**	**0**	**1**	**2**	**2**	**2**

TABLE 28:

[IF Q27 'Don't know/Not sure'] Approximately, how much does your business spend on electricity each month?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
$1 - $500	13	16	0	9	9	24	41	0	8	44	10	0	14	15	11
$501 - $1,000	6	8	0	5	7	6	12	9	0	22	5	0	5	6	6
$1,001 - $10,000	5	5	0	5	7	0	12	5	0	11	5	6	5	3	0
$10,000 or more	3	3	0	5	5	0	0	0	15	0	0	13	5	6	0
Don't know/Not sure	73	68	100	77	73	71	35	86	77	22	81	81	73	70	83
SAMPLE SIZE (#)	**64**	**38**	**4**	**22**	**44**	**17**	**17**	**22**	**13**	**9**	**21**	**16**	**22**	**33**	**18**
MEAN	$3,907.94	$2,540.42	.	$7,190.00	$5,425.00	$267.00	$1,309.55	$1,566.67	$15,776.67	$1,775.00	$1,045.00	$16,333.33	$6,050.83	$5,166.00	$393.33

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TABLE 29:

[IF Q28 'Don't know/Not sure'] Would you classify your business as....

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Large business	28	38	50	7	25	30	17	13	50	0	6	75	0	35	15
Small business	28	25	50	29	32	20	67	31	20	50	53	0	40	20	38
Large commercial	8	13	0	0	11	0	0	0	20	0	6	8	7	10	0
Small Commercial	3	4	0	0	0	10	0	6	0	0	6	0	0	0	8
Industrial	18	8	0	36	18	20	17	13	0	0	6	8	27	20	23
Institutional	18	13	0	29	14	20	0	38	10	50	24	8	27	15	15
SAMPLE SIZE (#)	**40**	**24**	**2**	**14**	**28**	**10**	**6**	**16**	**10**	**2**	**17**	**12**	**15**	**20**	**13**

TABLE 30:

What is the main source of energy used to heat your business' Nova Scotia location where you work?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Electricity	50	57	47	35	47	56	52	40	54	41	53	56	25	74	36
Oil	24	15	37	38	23	23	28	27	18	39	12	18	63	10	4
Heat pump/Mini-split heat pump	10	9	11	13	15	3	8	17	5	15	14	6	6	7	38
Natural gas	8	12	0	2	7	10	4	6	15	2	10	15	0	5	9
Propane	5	4	5	8	4	8	2	8	8	0	8	6	2	4	11
Wood/pellets/chips	2	2	0	4	4	0	6	2	0	2	3	0	3	1	2
SAMPLE SIZE (#)	**165**	**98**	**19**	**48**	**96**	**62**	**50**	**48**	**39**	**41**	**59**	**34**	**63**	**111**	**45**

NAVIGANT

2019 Electricity Usage Surveys - Business

TABLE 31:

What other types of heating, if any, do you currently have for your business' Nova Scotia location where you work?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Electricity	19	17	18	25	22	16	17	20	21	29	16	18	23	28	30
Heat pump/Mini-split heat pump	19	19	24	16	21	16	17	20	18	5	29	18	9	20	64
Oil	15	17	12	14	16	16	13	15	15	16	15	18	40	17	16
Propane	8	7	6	11	9	5	9	7	9	5	7	18	5	10	11
Natural gas	6	9	6	0	10	0	2	4	12	3	9	9	7	7	9
Wood/pellets/chips	5	5	0	7	8	0	11	0	3	8	4	6	4	7	9
Solar	3	5	0	0	3	2	0	0	9	0	2	9	2	3	5
Other	1	1	0	0	0	2	0	0	3	0	2	0	0	1	0
None - no other type of heating is used	42	43	41	39	34	51	48	39	44	39	33	47	37	31	7
SAMPLE SIZE (#)	**149**	**88**	**17**	**44**	**90**	**55**	**46**	**46**	**34**	**38**	**55**	**34**	**57**	**103**	**44**

NAVIGANT

2019 Electricity Usage Surveys - Business

TABLE 30+31:

What other types of heating, if any, do you currently have for your business' Nova Scotia location where you work?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Electricity	67	72	63	58	68	71	68	58	72	68	68	74	46	100	64
Oil	38	31	47	50	38	37	40	42	31	54	25	35	100	26	20
Heat pump/Mini-split heat pump	27	27	32	27	34	18	24	35	21	20	41	24	14	26	100
Natural gas	13	20	5	2	17	10	6	10	26	5	19	24	6	11	18
Propane	13	10	11	19	13	13	10	15	15	5	15	24	6	13	22
Wood/pellets/chips	7	6	0	10	11	0	16	2	3	10	7	6	6	7	11
Solar	2	4	0	0	3	2	0	0	8	0	2	9	2	3	4
Other	1	1	0	0	0	2	0	0	3	0	2	0	0	1	0
SAMPLE SIZE (#)	**165**	**98**	**19**	**48**	**96**	**62**	**50**	**48**	**39**	**41**	**59**	**34**	**63**	**111**	**45**

TABLE 32:

[IF Q30 OR Q31 'Electricity'] What type of electric heating does your business' location use?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Electric Baseboards (e.g., small electric heaters, places throughout your building, typically under windows)	60	54	80	67	62	58	59	69	78	67	53	65	63	60	48
Central Air-Source Heat Pump (i.e., a central heat pump system that heats all or most of the building, through distributed hot water or hot air)	11	11	10	11	10	14	3	15	17	4	15	17	7	11	22
Electric Resistance Furnace (i.e., a central furnace which uses an electric heating element and distributes heat through forced-air)	10	11	0	11	7	14	9	0	4	7	9	9	11	10	4
Ductless/Mini-Split Heat Pump (i.e., a heat pump system that has an indoor unit placed on a wall, that typically only heats a small area of the building)	8	8	10	7	10	6	16	4	0	11	12	4	4	8	15

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2019 Electricity Usage Surveys - Business

TABLE 32:

[IF Q30 OR Q31 'Electricity'] What type of electric heating does your business' location use?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Electric Resistance Boiler (i.e., a central furnace which uses an electric heating element and distributes heat through hot water, to your floor or radiators)	6	8	0	4	8	3	3	8	0	0	12	4	7	6	11
Other	4	7	0	0	3	6	9	4	0	11	0	0	7	4	0
SAMPLE SIZE (#)	**98**	**61**	**10**	**27**	**60**	**36**	**32**	**26**	**23**	**27**	**34**	**23**	**27**	**98**	**27**

TABLE 33:

In what specific business sector or industry is your organization currently involved as its primary activity?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Health care and social assistance	11	8	20	14	6	17	14	10	2	20	8	5	8	10	5
Retail trade	9	7	20	10	7	13	10	10	11	5	8	13	10	9	2
Construction	9	12	0	6	12	6	16	6	4	14	8	5	12	10	7
Other services (except public administration)	8	6	5	12	6	10	8	8	2	5	7	5	5	6	5
Educational services	8	6	10	10	7	8	10	10	4	7	15	0	10	4	14
Professional, scientific and technical services	6	7	5	4	5	8	8	4	7	14	5	5	5	6	12
Public administration	5	6	5	4	7	1	0	2	16	2	2	13	8	5	2
Accommodation and food services	5	4	10	8	10	0	6	6	4	2	3	13	7	6	7
Manufacturing	5	5	0	8	6	6	4	4	7	2	3	5	3	6	7
Finance and insurance	5	5	5	4	5	4	4	6	4	5	7	3	5	7	2
Administrative and support, waste management and remediation services	4	4	0	4	4	4	4	4	2	7	2	3	5	5	2
Information and cultural industries	4	5	5	0	3	6	2	0	7	0	5	8	3	5	0
Wholesale trade	4	4	10	2	5	3	2	2	7	5	7	3	2	3	7
Arts, entertainment and recreation	3	4	0	2	2	4	2	4	4	0	5	3	2	4	5
Transportation and warehousing	3	2	5	4	3	3	2	4	2	0	3	3	2	3	5
Agriculture, forestry, fishing and hunting	2	1	0	6	4	0	6	2	0	2	3	3	2	2	2
Real estate and rental and leasing	2	3	0	0	2	1	0	4	0	2	3	0	0	1	2

NAVIGANT

2019 Electricity Usage Surveys - Business

TABLE 33:

In what specific business sector or industry is your organization currently involved as its primary activity?

	OVERALL %	REGION			BUSINESS PREMISES		FT EMPLOYEES			SQUARE FOOTAGE			HEATING TYPE(S)		
		HRM	Cape Breton	Other mainland NS	Own	Lease/Rent	1-7	8-40	41+	Up to 2,000	2,001 - 10,000	More than 10,000	Oil	Electricity	Heat pump
Utilities	2	3	0	0	3	0	0	2	4	2	0	5	2	1	5
Management of companies and enterprises	1	1	0	2	2	0	2	2	0	5	0	0	3	2	0
Mining, quarrying, and oil and gas extraction	1	2	0	0	1	1	0	0	4	0	2	3	2	2	0
Other	4	5	0	2	4	4	2	6	7	2	5	3	3	4	7
SAMPLE SIZE (#)	**183**	**112**	**20**	**51**	**104**	**71**	**51**	**48**	**45**	**44**	**61**	**38**	**59**	**108**	**42**

Appendix C: Demand Response Model Inputs

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Appendix D: Demand Response Model Outputs

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Appendix E: Energy Efficiency Model Inputs

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Appendix F: Energy Efficiency Model Outputs

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Appendix G: EE Base Case Achievable 8760 Loadshape Disaggregation

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Year	Heat	WaterHt	Cooking	Misc	Lighting	TV	Dryer	Refrig	Freezer	Dish	Washer	EV	Total
2023	874.9	123.0	106.3	64.2	48.4	33.2	69.8	24.8	13.6	2.6	3.6	1.7	1,366.0
2032	893.9	195.4	137.6	84.5	50.0	32.4	91.1	29.0	16.1	3.3	4.8	124.7	1,662.9
						Percentages							
2023	64.0%	9.0%	7.8%	4.7%	3.5%	2.4%	5.1%	1.8%	1.0%	0.2%	0.3%	0.1%	
2032	53.8%	11.7%	8.3%	5.1%	3.0%	1.9%	5.5%	1.7%	1.0%	0.2%	0.3%	7.5%	

Please note that all values are in MW.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Heat	Misc	Light	Vent	Refrig	Office	EWHeat	Cooking	EV	Total
2023	200.7	81.4	126.8	25.5	43.9	30.5	5.9	8.9	0.6	524.2
2032	387.0	87.2	102.2	22.0	45.2	35.6	5.9	9.3	47.7	742.1
					Percentages					
2023	38.3%	15.5%	24.2%	4.9%	8.4%	5.8%	1.1%	1.7%	0.0	
2032	52.2%	11.7%	13.8%	3.0%	6.1%	4.8%	0.8%	1.3%	0.1	

Please note that all values are in MW.

Request IR-31:

Peak Demand (Section 10 Coincident Peak Demand Research, pp 90-94)

(a) Please provide more details about the use of interval data to understand peak loads at the class level.

(b) Please indicate specifically how many more years of data collection will be needed before the results can be applied to the forecast.

(c) What are the current levels of AMI coverage for the customer classes?

(d) Please specify by name the rate classes shown in Figures 70 and 71.

(e) What were the loss levels (absolute and percentage) on the 2022 peak day by hour as shown in Figure 70?

(f) What are the monthly loss levels as shown in Figure 71?

(g) Please quantify and explain the differences in Figure 72 between the Residential coincidental peak load with and without DSM, and please also explain the relationship between these differences and the DSM values in Figure 38 and the demand response values in Figure 56.

(h) What is the schedule for using the smart meter data in future forecasts to test the accuracy of the model?

Response IR-31:

(a) The Load Research analysis presented in Section 10 is based on the premise that the hourly load shape per class (weighted average across the load research meters) represents a "typical customer" for that class. Once a typical shape for the class has been obtained, the load shape of the entire class can be calculated (i.e., the theoretical sum of all the meters within the class). This is done by adjusting the sum of all the hourly load research within a month to the monthly total of billed sales for the class.

(b) The current SAE model used in the 2023 load forecast uses 10 years of hourly system generation data and monthly billing data to predict peak demand. A forecast that is based entirely on interval data will require both a sufficient historic data set as well as an updated methodology. The existing load research sample is being used as a placeholder to start to explore how interval data will be incorporated into the peak demand forecast, and the availability of AMI data will further enhance the data set in the coming years. Evaluation of peak forecasting using interval data compared to the existing model should begin in 2024 for the residential and commercial classes.

(c) In the load research sample, the Residential rate classes have a total of 214 meters, the Commercial class has 164 meters, and the Industrial class has 75 meters. The rest of the classes are fully sampled. The available AMI data by class as of April 1, 2023, is set out in the table below:

Customer Class	Total Customers[1] (%) with AMI[2]
Domestic	425,043 (86%)
Commercial	31,223 (83%)
Industrial	1,688 (75%)

(d) The names of the classes are:

(a) 02: Domestic Non-All-Electric
(b) 03: Domestic All-Electric
(c) 06: Domestic Time-of-Day
(d) 10: Small General
(e) 11: General Demand
(f) 21: Small Industrial
(g) 22: Medium Industrial
(h) "rest" is the sum of all the fully sampled (100 percent) classes

(e) The hourly difference between the system generation numbers (blue line), and the sum of all scaled load research classes, for 2022 peak day, is set out in the table below. The validation of these numbers as being representative of losses is still being analysed:

Date	Time	Losses (MW)	% Losses
2022-01-11	6:00:00	175.45	10.01%
2022-01-11	7:00:00	127.63	6.81%
2022-01-11	8:00:00	173.90	8.72%
2022-01-11	9:00:00	212.79	10.25%
2022-01-11	10:00:00	184.91	8.81%
2022-01-11	11:00:00	182.41	8.74%
2022-01-11	12:00:00	152.37	7.31%
2022-01-11	13:00:00	161.53	7.79%
2022-01-11	14:00:00	160.21	7.87%
2022-01-11	15:00:00	146.75	7.31%
2022-01-11	16:00:00	165.60	8.10%
2022-01-11	17:00:00	203.45	9.52%
2022-01-11	18:00:00	208.64	9.42%
2022-01-11	19:00:00	365.22	16.76%
2022-01-11	20:00:00	304.22	14.17%
2022-01-11	21:00:00	381.88	18.11%
2022-01-11	22:00:00	286.57	14.08%
2022-01-11	23:00:00	243.87	12.57%

Date	Time	Losses (MW)	% Losses
2022-01-12	0:00:00	250.71	13.08%
2022-01-12	1:00:00	236.16	12.46%
2022-01-12	2:00:00	260.63	13.95%
2022-01-12	3:00:00	286.10	15.41%
2022-01-12	4:00:00	265.71	14.29%
2022-01-12	5:00:00	224.72	11.98%
2022-01-12	6:00:00	237.73	12.33%

(f) The monthly difference between the system generation numbers (blue line), and the sum of all scaled load research classes, for the year 2022, is set out in the table below. The validation of these numbers as being representative of losses is still in the process of being analysed.

Month	Losses (GWh)	% Losses
1	128.85	10.37%
2	84.77	7.73%
3	61.26	5.62%
4	45.12	4.94%
5	49.49	5.92%
6	27.09	3.64%
7	54.94	6.67%
8	82.50	9.70%
9	39.07	5.40%
10	49.75	6.28%
11	88.95	9.57%
12	126.24	11.56%

(g) DSM was not used for LRS modeling as it is not available at an hourly level. The purpose of this experiment is to compare top-down (current) and bottom-up class peak estimation (experiment), therefore, to compare apples to apples DSM can be removed from both models.

(h) It is expected that some rate classes (e.g., Residential and Commercial) should have enough AMI data for both monthly and annual sales comparison (model vs actuals 2023+) by next load forecast report (2024).

Request IR-32:

Sensitivity Analysis (Section 11 and Appendix D)

(a) Please provide in electronic format the data and calculations used to create Figures 74, and 75.

(b) Please explain the reasons that these specific weather and economic variables were selected for the sensitivity analysis.

(c) Please provide the actual statistical distributions used for those variables and how they were determined.

(d) What other variables were considered but not chosen? Please discuss and explain.

Response IR-32:

(a) Please refer to Attachment 1, tabs "Figure 74," and "Figure 75".

(b) Ideally, all factors that are inputs in the regression models would be modeled. In practice, certain inputs are easier to model, particularly ones with a long history and available reliable information. Weather and economic indicators are two obvious starting points, as they have large historical data sets, and their trends are understood. These variables are the same ones in each rate class highlighted in Appendix B of the Report.

(c) All the variables used in the Monte Carlo simulation exhibit a normal distribution behavior. Generally mean values will be the deterministic forecast values used in the SAE models. In case of weather, they are weather normal and in the case of economics, they are the year-to-year growth rates. Please refer to Synapse IR-43 Attachment 2 for the inputs used.

(d) Inputs for DSM and end uses are more difficult to model, as they have more limited data sets and present challenges in the probabilistic approach being used. These are being studied for inclusion in future models.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Actual_Sales	p10	p50	p90
2013	11,193.6			
2014	11,037.4			
2015	11,099.1			
2016	10,809.0			
2017	10,872.7			
2018	11,248.9			
2019	11,077.1			
2020	10,722.5			
2021	10,902.2			
2022	11,133.9			
2023	11,307.5	11,092.7	11,307.5	11,526.1
2024		10,930.9	11,152.4	11,376.4
2025		10,934.6	11,163.1	11,394.8
2026		11,044.3	11,281.7	11,520.3
2027		11,123.0	11,365.9	11,609.5
2028		11,232.0	11,479.0	11,732.6
2029		11,304.5	11,556.7	11,817.5
2030		11,395.2	11,653.4	11,921.2
2031		11,494.5	11,760.1	12,038.5
2032		11,637.1	11,912.8	12,194.5
2033		11,732.2	12,014.3	12,306.2

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Actual_Peak	p10	p50	p90
2013	2,032.7			
2014	2,118.2			
2015	2,015.0			
2016	2,111.0			
2017	2,017.6			
2018	2,072.5			
2019	2,060.3			
2020	2,050.3			
2021	1,968.4			
2022	2,215.7			
2023	2,310.4	2,147.8	2,310.4	2,498.2
2024		2,164.0	2,329.2	2,520.2
2025		2,182.8	2,349.9	2,544.9
2026		2,240.4	2,410.7	2,609.4
2027		2,292.3	2,465.8	2,667.1
2028		2,349.9	2,525.4	2,729.1
2029		2,414.3	2,593.5	2,800.9
2030		2,480.6	2,663.0	2,874.2
2031		2,548.7	2,734.7	2,949.5
2032		2,621.1	2,807.8	3,027.6
2033		2,698.5	2,890.1	3,114.0

Request IR-33:

Sensitivity Analysis (Section 11, 2020 IRP Comparison, pp 97-98)

(a) Please provide information about how the evergreen IRP analysis might affect future loads.

(b) For comparison with the previous forecast please provide values for 2032 in Figure 68.

Response IR-33:

(a) The Evergreen IRP analysis is based on the 2022 Load Forecast. The Evergreen IRP results will allow NS Power to update its IRP Action Plan as required, which will in turn inform future load forecasts as more information is gathered on likely impacts to load and peak from both electrification and peak reduction programs in the province.

(b) Please refer to the following table:

Item	2023 NSR Energy (GWh)	2023 Firm Peak (MW)	2032 NSR Energy (GWh)	2032 Firm Peak (MW)	2033 NSR Energy (GWh)	2033 Firm Peak (MW)
2022 Load Forecast	11,177	2,035	11,519	2,342	11,605	2,404
2023 Load Forecast	11,288	2,105	11,998	2,545	12,113	2,627
2020 IRP High Electrification	11,481	2,196	11,686	2,760	12,350	2,918
2020 IRP Mid Electrification	11,337	2,114	11,414	2,395	11,438	2,416
2020 IRP Low Electrification	11,260	2,081	10,811	2,099	10,786	2,106

Request IR-34:

Appendix A: Forecast

(a) Please provide in electronic format the specific calculations used to create the values in Tables A1, and A2.

(b) Please explain the historical changes in the Interruptible Contribution to Peak values and the future year values used in the forecast.

Response IR-34:

(a) Please refer to 2023 Load Forecast Report Attachment 4 - 10-Year Forecast Classes (filed electronically), tab "Sector Summary" for the calculations used to create tables A1. Table A2 is derived from the information on the tab "Demand Annual Profile" tab.

(b) The table below shows a breakdown of interruptible peak forecasts compared to actuals. The forecast is expected to increase slowly from 146-156 MW as sales in the interruptible class increase.

	Actual Interruptible Peak	Forecast for following year	1 Year Difference vs Forecast	PHP Forecast	PHP Actual	1 Year Difference without PHP variance
2013	136	138	2			
2014	83	138	55	[redacted]		
2015	141	139	-2			
2016	98	144	46			
2017	67	156	89			
2018	80	156	76			
2019	111	163	52			
2020	96	152	56			
2021	94	158	64			
2022	155	146	-9			

Request IR-35:

Appendix B: Residential Model (pp 1-8)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full data and results used to produce the residential model coefficients and statistics tables.

(b) Please provide in electronic format the detailed end-use intensity data and its derivation.

(c) Please provide in electronic spreadsheet format the source and calculations of the values in the tables on pages 6, 7, and 8.

(d) Please provide the data and calculations associated with electric space heat and electric hot water usage.

(e) For the XHeat variable please provide the underlying factors (penetration, usage, etc.) driving the change of percentage for HP Heat.

(f) For the XCool variable please provide the underlying factors (penetration, usage, etc.) driving the change of percentage for HP Cool.

(g) For the XOther variable please provide the underlying factors (penetration, usage, etc.) driving the change of percentage for Other.

(h) Has NSPI collaborated with E1 in developing common assumptions for the end-use components? If so, please describe the results of that collaboration.

Response IR-35:

(a) Please refer to 2023 Load Forecast Report Attachment 5 - Residential Model, filed electronically, and 2023 Load Forecast Report Attachment 4 - 10-Year Forecast Classes, filed electronically.

(b) Please refer to 2023 Load Forecast Report Attachment 1 - Residential Intensities, filed electronically.

(c) Please refer to Attachment 1.

(d) Please refer to (b) above.

(e) The HP Heat share forecast is approximately 39.8 percent in 2023 and approximately 69.5 percent in 2033; this measure is the main driver for HP Heat growth in intensity. Please refer to 2023 Load Forecast Report Attachment 1 - Residential Intensities, filed electronically, tab “Intensities” and “Shares” for details and calculations.

(f) The HP Cool share forecast in 2023 is approximately 50.9 percent, and in 2033 is forecast to be approximately 87.1 percent; this measure change is the main driver for the growth in HP Intensity. Please refer to 2023 Load Forecast Report Attachment 1 - Residential Intensities, filed electronically, tab “Intensities” and “Shares” for details and calculations.

(g) There are no significant changes for the OtherUse variable in a 10-year span. As shown in Appendix B: page 2, the drivers within OtherUse are Household Size, Price, Seasonal Use Patterns and the economic indicator for that forecast report (Employment Compensation being this year’s).

(h) No collaboration on this topic was undertaken in 2022.

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	Heating Indices (kWh / HH)					Cooling Indices (kWh / HH)				
Year	ResIndices.EFurn	ResIndices.HPHeat	ResIndices.SecHt	ResIndices.FurnFan	AContrib2Sales.HeatUse	ResIndices.CAC	ResIndices.HPCool	ResIndices.GHPCool	ResIndices.RAC	AContrib2Sales.CoolUse
2013	2,760.46	375.19	387.05	84.44	1.08	20.90	39.24	0.00	49.03	1.06
2014	2,687.05	484.63	392.33	82.15	1.05	20.83	51.81	0.00	49.95	0.92
2015	2,623.89	571.61	398.99	80.22	1.10	20.78	70.28	0.00	51.77	1.10
2016	2,569.60	662.13	412.95	77.77	1.03	21.16	88.34	0.00	53.76	1.11
2017	2,525.47	758.78	428.72	75.71	1.03	22.07	106.15	0.00	54.53	1.03
2018	2,460.69	846.82	441.07	73.09	1.05	22.75	122.23	0.00	54.80	1.27
2019	2,397.01	932.47	477.35	70.59	1.10	23.44	137.63	0.00	56.14	1.04
2020	2,310.45	1,021.88	483.89	72.67	1.01	24.16	146.70	0.00	56.44	1.08
2021	2,251.41	1,129.00	486.33	71.03	0.96	24.89	157.28	0.00	56.73	1.16
2022	2,120.96	1,260.96	499.17	69.40	0.97	25.61	169.93	0.00	56.89	1.25
2023	1,998.87	1,383.97	511.61	67.87	1.05	25.98	181.98	0.00	57.08	1.11
2024	1,934.63	1,511.01	518.79	66.41	1.05	26.53	194.21	0.00	57.26	1.13
2025	1,859.99	1,639.45	532.55	65.71	1.03	27.08	206.31	0.00	57.49	1.14
2026	1,762.99	1,769.70	548.49	64.93	1.03	27.63	218.06	0.00	57.75	1.16
2027	1,667.19	1,899.29	564.46	64.16	1.03	28.17	229.52	0.00	58.03	1.17
2028	1,580.22	2,026.05	579.29	63.41	1.03	28.71	240.44	0.00	58.34	1.18
2029	1,495.83	2,139.64	593.74	62.68	1.02	29.25	250.87	0.00	58.68	1.20
2030	1,414.39	2,249.83	607.97	61.95	1.01	29.78	260.86	0.00	58.87	1.21
2031	1,335.35	2,356.85	621.76	61.11	1.01	30.32	270.40	0.00	59.23	1.22
2032	1,260.74	2,459.29	635.04	60.20	1.01	30.85	279.41	0.00	59.65	1.23
2033	1,190.05	2,552.41	647.75	59.18	1.00	31.39	287.91	0.00	60.06	1.25

	Other Indices (kWh / HH)												
Year	ResIndices.EWHeat	ResIndices.ECook	ResIndices.Ref1	ResIndices.Ref2	ResIndices.Frz	ResIndices.Dish	ResIndices.CWash	ResIndices.EDry	ResIndices.TV	ResIndices.Light	ResIndices.PV	ResIndices.Misc	AContrib2Sales.OtherUse
2013	1,266.45	533.19	473.96	54.40	220.48	57.28	53.36	744.63	557.73	970.73	0.00	1,108.44	0.97
2014	1,287.62	532.44	462.68	53.12	215.54	55.78	51.55	744.80	556.05	959.20	0.00	1,132.95	0.96
2015	1,302.91	531.89	452.23	51.92	211.89	54.18	49.33	743.81	554.37	947.80	0.00	1,145.58	0.96
2016	1,323.04	531.34	446.07	51.43	209.71	53.95	48.82	745.95	534.89	894.06	0.00	1,188.27	0.96
2017	1,343.10	530.79	440.00	50.98	207.67	53.71	48.31	749.61	512.22	839.97	0.00	1,187.68	0.96
2018	1,374.48	530.26	433.76	50.51	205.58	53.47	47.56	753.22	489.00	791.39	0.00	1,187.09	0.97
2019	1,405.77	529.74	427.44	50.01	203.47	53.23	47.63	756.75	466.95	733.84	0.00	1,186.50	0.97
2020	1,427.34	531.23	420.99	49.53	201.41	53.00	47.70	757.54	450.37	676.28	0.00	1,185.90	0.97
2021	1,465.98	529.73	414.56	49.06	199.36	52.79	47.84	758.45	439.22	618.73	0.00	1,185.31	0.97
2022	1,500.78	529.69	408.08	48.55	197.39	52.56	47.94	759.15	422.14	561.18	0.00	1,184.72	0.98
2023	1,535.75	529.65	401.59	48.02	195.37	52.32	48.07	759.68	406.87	503.63	0.00	1,184.13	0.98
2024	1,577.21	529.61	395.62	47.55	193.33	52.08	48.23	760.13	392.70	446.08	0.00	1,183.53	0.98
2025	1,615.04	529.58	389.96	47.10	191.26	51.82	48.39	760.50	379.62	388.52	0.00	1,182.94	0.97
2026	1,647.43	529.55	384.61	46.68	189.16	51.55	48.58	760.76	367.14	383.50	0.00	1,185.74	0.97
2027	1,679.20	529.51	379.54	46.27	187.05	51.26	48.78	760.89	354.78	379.60	0.00	1,186.38	0.97
2028	1,709.65	529.47	374.75	45.88	185.08	51.06	48.98	761.21	343.01	376.75	0.00	1,187.15	0.97
2029	1,737.98	529.42	370.21	45.51	183.19	50.93	49.21	761.69	331.54	373.92	0.00	1,186.90	0.97
2030	1,752.69	529.36	366.01	45.18	181.39	50.87	49.49	762.31	322.30	368.89	0.00	1,192.16	0.97
2031	1,767.61	529.28	362.18	44.88	179.66	50.88	49.73	763.07	313.16	364.28	0.00	1,196.44	0.97
2032	1,782.20	529.19	358.69	44.61	178.02	50.95	49.98	763.96	304.24	359.95	0.00	1,199.91	0.97
2033	1,796.71	529.11	355.56	44.38	176.46	51.10	50.22	764.98	295.62	355.75	0.00	1,202.16	0.97

	Other Regression Variables								
Year	AContrib2Sales.AvgEESavings	AContrib2Sales.May15	AContrib2Sales.Apr15	AContrib2Sales.Aug	AContrib2Sales.Jan	AContrib2Sales.Sep	AContrib2Sales.Oct	AContrib2Sales.Feb15	AContrib2Sales.Oct22
2013	471.61	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2014	627.22	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2015	771.16	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
2016	901.45	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2017	1,013.07	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2018	1,105.30	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
2019	1,186.91	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2020	1,250.22	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2021	1,307.28	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2022	1,371.08	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
2023	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2024	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2025	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2026	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2027	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2028	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2029	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2030	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2031	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2032	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00
2033	1,401.01	0.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00

Year	AContrib2Sales.Mar2	AContrib2Sales.ARMA	AContrib2Sales.Covid_bin	Regression Sales Results Out of Monthly Model (kWh / HH) AContrib2Sales.AnnualAvgUse
2013	0.00	28.77	0.00	9,738.05
2014	0.00	1.76	0.00	9,598.06
2015	0.00	-40.77	0.00	9,908.00
2016	0.00	-41.15	0.00	9,496.87
2017	0.00	-23.21	0.00	9,470.37
2018	0.00	4.89	0.00	9,711.80
2019	0.00	22.76	0.00	9,810.51
2020	0.00	10.53	319.31	9,696.77
2021	0.00	8.80	425.74	9,637.99
2022	1.00	19.83	334.74	9,810.03
2023	0.00	-1.91	307.60	9,838.55
2024	0.00	0.00	307.60	9,878.85
2025	0.00	0.00	307.60	9,851.53
2026	0.00	0.00	307.60	9,920.27
2027	0.00	0.00	307.60	9,985.61
2028	0.00	0.00	307.60	10,089.95
2029	0.00	0.00	307.60	10,105.96
2030	0.00	0.00	307.60	10,154.71
2031	0.00	0.00	307.60	10,204.20
2032	0.00	0.00	307.60	10,294.33
2033	0.00	0.00	307.60	10,301.11

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Year	Res.Indices Heating	Res.Indices Cooling	Res.Indices Others	XHeat	XCool	XOther	AvgEESavings	15-May	15-Apr	Aug	Jan	Sep	Oct	AContrib2Sales.Feb18	AContrib2Sales.Oct22	AContrib2Sales.Mar22	ARMA	Covid	XHeatNew	XCoolNew	XOtherNew
2013	3,607.1	109.2	6,040.7	3,879.8	115.4	5,833.5	471.60814	0	0	1	1	1	1	0	0	0	28.77235	0	4,058.28	134.02	5,477.62
2014	3,646.2	122.6	6,051.7	3,837.6	113.0	5,833.7	627.22017	0	0	1	1	1	1	0	0	0	1.75837	0	4,014.14	131.16	5,477.82
2015	3,674.7	142.8	6,045.9	4,035.0	157.4	5,819.3	771.15603	1	1	1	1	1	1	0	0	0	-40.7654	0	4,220.59	182.77	5,464.35
2016	3,722.5	163.3	6,027.5	3,843.3	182.0	5,803.9	901.44657	0	0	1	1	1	1	0	0	0	-41.15316	0	4,020.07	211.25	5,449.82
2017	3,788.7	182.8	5,964.1	3,892.8	189.0	5,744.5	1013.06984	0	0	1	1	1	1	0	0	0	-23.21469	0	4,071.82	219.46	5,394.10
2018	3,821.7	199.8	5,916.3	4,030.2	253.7	5,716.4	1105.29868	0	0	1	1	1	1	1	0	0	4.88544	0	4,215.64	294.54	5,367.66
2019	3,877.4	217.2	5,861.3	4,277.8	225.4	5,663.9	1186.90991	0	0	1	1	1	1	0	0	0	22.76362	0	4,474.59	261.63	5,318.41
2020	3,888.9	227.3	5,801.3	3,926.0	246.1	5,611.1	1250.22134	0	0	1	1	1	1	0	0	0	10.52541	319.30767	4,106.58	285.67	5,268.80
2021	3,937.8	238.9	5,761.0	3,778.9	277.4	5,588.9	1307.28394	0	0	1	1	1	1	0	0	0	8.80239	425.74356	3,952.71	322.08	5,247.93
2022	3,950.5	252.4	5,712.2	3,818.0	315.0	5,577.0	1371.07928	0	0	1	1	1	1	0	1	1	19.83398	334.74087	3,993.66	365.76	5,236.84
2023	3,962.3	265.0	5,665.1	4,161.7	295.3	5,536.1	1401.00923	0	0	1	1	1	1	0	0	0	-1.91353	307.59972	4,353.18	342.88	5,198.39
2024	4,030.8	278.0	5,626.1	4,218.5	313.1	5,490.1	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,412.52	363.52	5,155.19
2025	4,097.7	290.9	5,584.8	4,234.7	331.5	5,420.7	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,429.50	384.87	5,090.06
2026	4,146.1	303.4	5,594.7	4,268.7	350.5	5,432.3	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,465.07	406.90	5,100.91
2027	4,195.1	315.7	5,603.3	4,302.2	369.3	5,441.0	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,500.05	428.75	5,109.14
2028	4,249.0	327.5	5,613.0	4,361.3	387.4	5,462.9	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,561.92	449.80	5,129.67
2029	4,291.9	338.8	5,620.5	4,365.0	405.3	5,454.2	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,565.81	470.54	5,121.48
2030	4,334.1	349.5	5,620.7	4,392.0	422.6	5,454.3	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,594.02	490.69	5,121.63
2031	4,375.1	360.0	5,621.2	4,418.7	439.8	5,455.8	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,622.00	510.61	5,123.01
2032	4,415.3	369.9	5,621.7	4,469.3	456.6	5,473.5	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,674.91	530.07	5,139.62
2033	4,449.4	379.4	5,622.0	4,468.7	472.8	5,462.0	1401.00923	0	0	1	1	1	1	0	0	0	0	307.59972	4,674.21	548.89	5,128.80

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Year	AvgEESavingsNew	15 May New	15 Apr New	Aug New	Jan New	Sep New	Oct New	Feb18 New	Oct22 New	Mar22 New	ARMA new	Covid New	Total (kWh)
2013	(200.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	28.77	-	9,738.96
2014	(266.57)	-	-	54.39	69.72	74.84	41.74	-	-	-	1.76	-	9,599.01
2015	(327.74)	87.25	82.28	54.39	69.72	74.84	41.74	-	-	-	(40.77)	-	9,909.42
2016	(383.11)	-	-	54.39	69.72	74.84	41.74	-	-	-	(41.15)	-	9,497.57
2017	(430.55)	-	-	54.39	69.72	74.84	41.74	-	-	-	(23.21)	-	9,472.30
2018	(469.75)	-	-	54.39	69.72	74.84	41.74	60.06	-	-	4.89	-	9,713.73
2019	(504.44)	-	-	54.39	69.72	74.84	41.74	-	-	-	22.76	-	9,813.65
2020	(531.34)	-	-	54.39	69.72	74.84	41.74	-	-	-	10.53	319.31	9,700.24
2021	(555.60)	-	-	54.39	69.72	74.84	41.74	-	-	-	8.80	425.74	9,642.36
2022	(582.71)	-	-	54.39	69.72	74.84	41.74	-	145.76	61.87	19.83	334.74	9,816.45
2023	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	(1.91)	307.60	9,845.40
2024	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	9,884.10
2025	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	9,857.29
2026	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	9,925.75
2027	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	9,990.81
2028	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	10,094.25
2029	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	10,110.70
2030	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	10,159.20
2031	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	10,208.48
2032	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	10,297.47
2033	(595.43)	-	-	54.39	69.72	74.84	41.74	-	-	-	-	307.60	10,304.78

Regression Coefficients

	MStructRes.WtXHeat	MStructRes.WtXCool	MStructRes.WtXOther	MSales.AvgEESavingsProfiled	MBin.Jan	MBin.Aug	MBin.Sep	MBin.Oct	MBin.Apr15	MBin.May15	MBin.Feb18	MBin.Covid2020SteppedUpdate	MBin.Oct22	MBin.Mar22	MA(1)
Variable															
Coefficient	1.046	1.161	0.939	-0.425	69.724	54.393	74.839	41.74	82.277	87.249	60.064	70.957	145.757	61.873	0.49
StdErr	0.027	0.321	0.029	0.146	7.432	13.998	18.395	11.528	24.871	24.604	22.045	16.079	23.017	21.517	0.096
T-Stat	38.581	3.615	32.505	-2.921	9.381	3.886	4.069	3.621	3.308	3.546	2.725	4.413	6.333	2.876	5.108
P-Value	0	0.0005	0	0.0043	0	0.0002	0.0001	0.0005	0.0013	0.0006	0.0075	0	0	0.0049	0

MStructRe	1.046	0.027	3858.10%	0.00%	
MStructRe	1.161	0.321	361.50%	0.05%	
MStructRe	0.939	0.029	3250.50%	0.00%	
MSales.Av	-0.425	0.146	-292.10%	0.43%	kWh
MBin.Jan	69.724	7.432	938.10%	0.00%	
MBin.Aug	54.393	13.998	388.60%	0.02%	
MBin.Sep	74.839	18.395	4.069	0.01%	
MBin.Oct	41.74	11.528	3.621	0.05%	
MBin.Apr1	82.277	24.871	3.308	0.13%	
MBin.May	87.249	24.604	3.546	0.06%	
MBin.Feb1	60.064	22.045	2.725	0.75%	
MBin.Covi	70.957	16.079	4.413	0.00%	
MBin.Oct2	145.757	23.017	6.333	0.00%	
MBin.Mar.	61.873	21.517	2.876	0.49%	
MA(1)	0.49	0.096	5.108	0.00%	

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		Customer count and housing						New housing usage					NSPI and other Programs					Before future DSM
Year	SAE model Regression Sales (kWh / HH)	Historical Customer Count	Incremental New Housing Single Family	Cumlative New Housing Single Family	New Housing Multi Unit	Cumulative New Housing Multi Unit	Forecasted Customer Count	New Usage Single Family	New Usage Multi Family	Structural Change Index		Forecast without HP and without DSM (GWh)	RTR (GWh)	Electric Veahicles (GWh)	End-Use Plug (Estimated Work from Home)	Solar PV (GWh)	Total Programs (GWh)	Total SAE + adjsutments outside model
2013	9,739.0	450,977.0					450,977.0					4,392.0						**4,392.0**
2014	9,599.0	453,877.0					453,877.0					4,356.8						**4,356.8**
2015	9,909.4	456,655.0					456,655.0					4,525.2						**4,525.2**
2016	9,497.6	459,875.0					459,875.0					4,367.7						**4,367.7**
2017	9,472.3	463,739.0					463,739.0					4,392.7						**4,392.7**
2018	9,713.7	468,049.0					468,049.0					4,546.5						**4,546.5**
2019	9,813.6	472,369.0					472,369.0					4,635.7						**4,635.7**
2020	9,700.2	477,035.0					477,035.0					4,627.4						**4,627.4**
2021	9,642.4	482,771.0		-		-	482,771.0					4,655.1						**4,655.1**
2022	9,816.5	488,654.0		-		-	488,654.0					4,796.8		2		(18)		**4,796.8**
2023	9,845.4	488,654.0	2,191.7	2,191.7	3,985.0	3,985.0	494,830.7	16000	4860	1	54.4	4,888.4		7		(39)	(31.7)	**4,856.7**
2024	9,884.1	488,654.0	2,016.9	4,208.6	3,765.3	7,750.3	500,612.8	16000	4860	1.005451	105.6	4,958.5	(14.0)	15		(62)	(61.2)	**4,897.3**
2025	9,857.3	488,654.0	1,869.8	6,078.3	3,711.3	11,461.6	506,193.9	16000	4860	1.010969	154.6	4,994.4	(14.0)	31		(90)	(73.1)	**4,921.3**
2026	9,925.7	488,654.0	1,695.2	7,773.5	3,562.3	15,023.9	511,451.4	16000	4860	1.016077	200.6	5,073.8	(14.0)	60		(117)	(71.2)	**5,002.7**
2027	9,990.8	488,654.0	1,521.1	9,294.6	3,357.2	18,381.0	516,329.6	16000	4860	1.020829	243.0	5,148.1	(14.0)	101		(152)	(64.5)	**5,083.5**
2028	10,094.3	488,654.0	1,353.6	10,648.2	3,119.5	21,500.5	520,802.7	16000	4860	1.025177	281.8	5,237.4	(14.0)	160		(191)	(45.6)	**5,191.8**
2029	10,110.7	488,654.0	1,203.2	11,851.5	2,894.8	24,395.3	524,900.8	16000	4860	1.029215	317.2	5,280.8	(14.0)	244		(237)	(7.6)	**5,273.2**
2030	10,159.2	488,654.0	1,069.6	12,921.1	2,686.3	27,081.6	528,656.7	16000	4860	1.033265	349.6	5,336.9	(14.0)	333		(290)	29.3	**5,366.2**
2031	10,208.5	488,654.0	950.8	13,871.8	2,492.9	29,574.5	532,100.3	16000	4860	1.037016	379.2	5,390.6	(14.0)	433		(348)	70.9	**5,461.5**
2032	10,297.5	488,654.0	845.1	14,716.9	2,313.3	31,887.8	535,258.8	16000	4860	1.040964	406.4	5,461.3	(14.0)	544		(413)	116.9	**5,578.2**
2033	10,304.8	488,654.0	751.2	15,468.2	2,146.7	34,034.5	538,156.7	16000	4860	1.044951	431.5	5,489.9	(14.0)	666		(485)	166.9	**5,656.8**

Residential load post regression

	Existing Cus	New Custo	EV's	Solar	RTR	Residential Sa	DSM	Residential Sales (with DSM)	Total DSM Captured by End Uses	
2023	9,845	77	7	(39)	-	4,857	(27)	4,830	(62)	(36)
2033	10,305	454	666	(485)	(14)	5,657	(297)	5,360	(698)	(402)
Change to	4.7%	7.8%	13.6%	-9.2%	-0.3%	16.5%	-5.6%	11.0%		

Residential Average Use - Regression (includes coefficients)

	Xheat	Xcool	Xother	EESavings	Binaries	ARMA	Covid	Total Average Use
2023	4,353	343	5,198	(595)	241	(2)	308	9,845
2033	4,674	549	5,129	(595)	241	-	308	10,305
Change to	3.3%	2.1%	-0.7%	0.0%	0.0%	0.0%	0.0%	4.7%

Residential Intensities - Inputs to Regression

Xheat Inputs

	Efurn	HP Heat	Secondary	Furnace Fa	HeatUse Va	Coefficient	Total Xheat
2023	1,999	1,384	512	68	1.05	1.046	4,353
2033	1,190	2,552	648	59	1.00	1.046	4,674
Change to	-18.6%	26.8%	3.1%	-0.2%	-4.4%	0.0%	7.4%

Xcool Inputs

	Central AC	HP Cool	Room AC	CoolUse Va	Coefficient	Total Xcool
2023	26	182	57	1.1	1.161	343
2033	31	288	60	1.2	1.161	549
Change to	1.6%	30.9%	0.9%	11.8%	0.0%	60.1%

Xother Inputs

	EWHeat	ECook	Ref/Frz	Washer/Dr	TV	Light	Misc	OtherUse '	Coeff		Total Xother
2023	1,536	530	645	808	407	504	1,236	0.98	0.939		5,198
2033	1,797	529	576	815	296	356	1,253	0.97	0.939		5,129
Change to	5.0%	0.0%	-1.3%	0.1%	-2.1%	-2.8%	0.3%	-0.6%	0.0%		-1.3%

Request IR-36:

Appendix B: Small General Service Model (pp 9-14)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full results used to produce the commercial model coefficients and statistics tables.

(b) Please provide in electronic spreadsheet format the calculation of the XHeat, XCool and XOther variables.

(c) Please provide in electronic spreadsheet format the calculations used to produce the commercial sales forecast.

(d) For the XHeat variable please provide the underlying factors (penetration, usage, etc.) driving the increase of 19.1% for Heating Intensity.

(e) Please quantify the adjustments done outside the model for other growth programs PV, EV and DSM and their derivations (p12).

(f) Please provide in electronic spreadsheet format the source and calculations of the values in the tables on pages 12-13.

Response IR-36:

(a) Please refer to 2023 Load Forecast Report Attachment 6 - Small General Model, filed electronically, for details.

(b) The calculation of the XHeat, XCool, and XOther values was completed in Metrix ND, the forecasting software used by NS Power. The methodology used to calculate these variables

is outlined in Appendix B, Forecast Model Details in the Load Forecast report. The inputs to XHeat, XCool, and XOther are shown in 2023 Load Forecast Report Attachment 2 - Small General Intensities, filed electronically. The components of the calculation are provided in Attachment 1.

(c) All calculations are completed within Metrix ND. Input values, coefficients and outputs can be found in 2023 Load Forecast Report Attachment 6 - Small General Model, filed electronically.

(d) To clarify, the increase is 18.9 percent and is driven by growth in heat pumps in this sector (like Residential) as shown in the increased heat share in 2023 Load Forecast Report Attachment 2 - Small General Intensities on the Shares tab (column B), filed electronically.

(e) Please refer to Synapse IR-10 Attachment 1 for PV details (the forecast assumes 3 percent of total PV generation applies to the small general class), Synapse IR-09 Attachment 1 for EV details (the forecast assumes 20 percent of the commercial EV load applies to the small general class), and Synapse IR-16 Attachment 1 for DSM details (the forecast assumes 11 percent of the commercial DSM applies to the small general class).

(f) Please refer to Attachment 1.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	Heating Indices (kWh / HH)		Cooling Indices (kWh / HH)	
Year	SmlGenIndices.Heating	AContrib2Sales.SmlGenHeatUse	SmlGenIndices.Cooling	AContrib2Sales.SmlGenCoolUse
2013	46,709.80	1.140	38,192.07	1.120
2014	48,232.83	1.120	38,019.24	0.980
2015	48,578.07	1.170	37,752.15	1.170
2016	49,816.77	1.120	37,599.09	1.210
2017	50,664.94	1.120	37,554.81	1.130
2018	52,433.60	1.170	37,301.07	1.400
2019	54,172.92	1.240	37,053.92	1.180
2020	55,553.34	1.120	36,916.53	1.190
2021	57,191.25	1.090	36,680.09	1.340
2022	59,227.60	1.140	36,449.67	1.480
2023	60,705.57	1.260	36,323.78	1.340
2024	61,995.09	1.270	36,103.16	1.370
2025	63,547.29	1.270	35,888.06	1.400
2026	64,913.84	1.270	35,772.68	1.430
2027	65,800.60	1.280	35,659.92	1.460
2028	67,031.99	1.290	35,457.38	1.490
2029	68,185.27	1.290	35,350.68	1.520
2030	68,838.53	1.300	35,246.40	1.550
2031	69,852.87	1.300	35,144.50	1.580
2032	70,794.31	1.320	35,133.43	1.610
2033	71,670.12	1.320	35,035.22	1.640

	Other Indices (kWh / HH)						
Year	SmlGenIndices.Vent	SmlGenIndices.EWHeat	SmlGenIndices.Cooking	SmlGenIndices.Refrig	SmlGenIndices.Light	SmlGenIndices.Office	SmlGenIndices.Misc
2013	14,231.95	1,796.55	2,112.53	24,703.61	69,483.97	13,439.59	37,614.93
2014	13,947.32	1,810.56	2,067.24	24,600.09	69,208.69	13,402.81	36,911.98
2015	13,673.84	1,806.93	2,048.19	24,464.25	68,933.42	13,334.36	36,317.75
2016	13,410.88	1,820.45	2,034.71	24,350.75	68,658.14	13,255.72	35,850.58
2017	13,157.85	1,816.73	2,024.61	24,201.10	68,382.86	13,204.11	35,258.87
2018	12,914.18	1,828.29	2,008.58	24,009.67	67,832.30	13,159.39	34,583.94
2019	12,914.18	1,856.01	1,996.21	23,851.84	65,236.85	13,126.92	34,158.83
2020	12,679.38	1,865.18	1,983.32	23,589.46	62,204.29	13,173.94	34,674.92
2021	12,452.96	1,905.98	1,965.87	23,216.08	59,377.20	13,195.31	34,686.57
2022	12,234.49	1,928.48	1,951.26	22,955.38	57,067.49	13,183.43	34,135.28
2023	12,023.55	1,967.76	1,943.11	22,741.01	55,019.72	13,187.97	33,725.39
2024	11,819.76	1,990.08	1,936.64	22,543.98	53,177.78	13,226.52	33,525.86
2025	11,622.76	2,026.71	1,897.60	22,358.00	51,581.39	13,290.42	33,356.54
2026	11,247.84	2,056.47	1,885.22	22,163.30	50,191.89	13,360.85	33,227.30
2027	10,896.34	2,085.29	1,872.91	21,963.39	48,978.29	13,419.32	33,112.73
2028	10,566.15	2,131.30	1,862.41	21,770.93	47,477.50	13,504.43	32,987.75
2029	10,255.38	2,158.87	1,851.69	21,649.95	46,162.27	13,587.55	32,877.78
2030	9,962.37	2,185.85	1,843.04	21,490.66	43,926.02	13,697.38	32,811.96
2031	9,552.96	2,212.88	1,833.66	21,334.03	41,924.26	13,798.54	32,758.02
2032	9,298.21	2,239.74	1,824.58	21,176.68	40,148.04	13,911.61	32,698.85
2033	9,056.70	2,266.10	1,814.22	21,069.96	38,593.63	14,025.55	32,648.56

Year	SmlGenIndices.PV	AContrib2Sales.SmlGenOtherUse
2013	0.00	12.310
2014	0.00	12.290
2015	0.00	12.310
2016	0.00	12.500
2017	0.00	12.660
2018	0.00	12.820
2019	0.00	13.080
2020	0.00	12.820
2021	0.00	13.340
2022	0.00	13.850
2023	0.00	14.060
2024	0.00	14.210
2025	0.00	14.290
2026	0.00	14.420
2027	0.00	14.540
2028	0.00	14.700
2029	0.00	14.790
2030	0.00	14.920
2031	0.00	15.060
2032	0.00	15.240
2033	0.00	15.350

	Other Regression Variables						
Year	AContrib2Sales.Mar	AContrib2Sales.Sep	AContrib2Sales.Dec	AContrib2Sales.Oct22	AContrib2Sales.May20	AContrib2Sales.Jun20	AContrib2Sales.SmlGenARMA
2013	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2014	1.00	1.00	1.00	0.00	0.00	0.00	-181.54
2015	1.00	1.00	1.00	0.00	0.00	0.00	40.05
2016	1.00	1.00	1.00	0.00	0.00	0.00	65.55
2017	1.00	1.00	1.00	0.00	0.00	0.00	-11.95
2018	1.00	1.00	1.00	0.00	0.00	0.00	13.08
2019	1.00	1.00	1.00	0.00	0.00	0.00	66.52
2020	1.00	1.00	1.00	0.00	1.00	1.00	-58.61
2021	1.00	1.00	1.00	0.00	0.00	0.00	-52.19
2022	1.00	1.00	1.00	1.00	0.00	0.00	24.15
2023	1.00	1.00	1.00	0.00	0.00	0.00	187.14
2024	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2025	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2026	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2027	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2028	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2029	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2030	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2031	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2032	1.00	1.00	1.00	0.00	0.00	0.00	0.00
2033	1.00	1.00	1.00	0.00	0.00	0.00	0.00

	Regression Sales Results Out of Monthly Model (kWh / HH)
Year	AContrib2Sales.AnnualAvgUse
2013	10,865.32
2014	10,579.12
2015	11,005.16
2016	11,020.99
2017	11,025.96
2018	11,423.26
2019	11,738.35
2020	10,775.91
2021	11,244.70
2022	11,961.43
2023	12,365.40
2024	12,274.91
2025	12,328.15
2026	12,430.55
2027	12,492.44
2028	12,610.11
2029	12,656.17
2030	12,666.43
2031	12,711.53
2032	12,822.84
2033	12,858.53

Year	SmlGenIndices Heating	SmlGenIndices Cooling	SmlGenIndices Others	XHeat	XCool	XOther
2013	46,709.8	38,192.1	163,383.1	3,727.4	1,497.1	10,056.2
2014	48,232.8	38,019.2	161,948.7	3,781.5	1,304.1	9,951.7
2015	48,578.1	37,752.2	160,578.7	3,978.5	1,546.0	9,883.6
2016	49,816.8	37,599.1	159,381.2	3,905.6	1,592.3	9,961.3
2017	50,664.9	37,554.8	158,046.1	3,972.1	1,485.3	10,004.3
2018	52,433.6	37,301.1	156,336.4	4,294.3	1,827.8	10,021.2
2019	54,172.9	37,053.9	153,140.8	4,702.2	1,530.3	10,015.4
2020	55,553.3	36,916.5	150,170.5	4,355.4	1,537.6	9,625.9
2021	57,191.3	36,680.1	146,800.0	4,363.7	1,720.3	9,791.6
2022	59,227.6	36,449.7	143,455.8	4,726.4	1,888.1	9,934.3
2023	60,705.6	36,323.8	140,608.5	5,354.2	1,703.6	9,884.8
2024	61,995.1	36,103.2	138,220.6	5,511.4	1,731.1	9,820.6
2025	63,547.3	35,888.1	136,133.4	5,649.4	1,758.5	9,726.7
2026	64,913.8	35,772.7	134,132.9	5,770.8	1,790.4	9,671.0
2027	65,800.6	35,659.9	132,328.3	5,895.7	1,822.2	9,620.3
2028	67,032.0	35,457.4	130,300.5	6,053.0	1,849.1	9,577.1
2029	68,185.3	35,350.7	128,543.5	6,157.1	1,880.7	9,505.8
2030	68,838.5	35,246.4	125,917.3	6,264.3	1,912.1	9,393.4
2031	69,852.9	35,144.5	123,414.4	6,356.6	1,943.5	9,293.1
2032	70,794.3	35,133.4	121,297.7	6,541.4	1,979.8	9,242.9
2033	71,670.1	35,035.2	119,474.7	6,622.3	2,011.0	9,169.7

Year	Mar	Sept	Dec	22-Oct	May 20	Jun 20	ARMA	XHeatNew	XCoolNew
2013	1	1	1	0	0	0	0	3,186.96	452.13
2014	1	1	1	0	0	0	-181.54	3,233.14	393.83
2015	1	1	1	0	0	0	40.05	3,401.66	466.88
2016	1	1	1	0	0	0	65.55	3,339.32	480.88
2017	1	1	1	0	0	0	-11.95	3,396.17	448.56
2018	1	1	1	0	0	0	13.08	3,671.64	551.98
2019	1	1	1	0	0	0	66.52	4,020.39	462.16
2020	1	1	1	0	1	1	-58.61	3,723.85	464.35
2021	1	1	1	0	0	0	-52.19	3,730.96	519.53
2022	1	1	1	1	0	0	24.15	4,041.04	570.20
2023	1	1	1	0	0	0	187.14	4,577.87	514.48
2024	1	1	1	0	0	0	0	4,712.22	522.81
2025	1	1	1	0	0	0	0	4,830.20	531.07
2026	1	1	1	0	0	0	0	4,934.07	540.71
2027	1	1	1	0	0	0	0	5,040.85	550.31
2028	1	1	1	0	0	0	0	5,175.31	558.43
2029	1	1	1	0	0	0	0	5,264.35	567.96
2030	1	1	1	0	0	0	0	5,355.98	577.46
2031	1	1	1	0	0	0	0	5,434.90	586.93
2032	1	1	1	0	0	0	0	5,592.89	597.89
2033	1	1	1	0	0	0	0	5,662.08	607.33

Year	XOtherNew	Mar New	Sept New	Dec New	Oct 22 New	May 20 New	Jun 20 New	ARMA new	Total (kWh)
2013	7,180.15	93.23	57.33	(112.25)	-	-	-	-	10,857.55
2014	7,105.55	93.23	57.33	(112.25)	-	-	-	(181.54)	10,589.28
2015	7,056.91	93.23	57.33	(112.25)	-	-	-	40.05	11,003.79
2016	7,112.39	93.23	57.33	(112.25)	-	-	-	65.55	11,036.44
2017	7,143.08	93.23	57.33	(112.25)	-	-	-	(11.95)	11,014.17
2018	7,155.11	93.23	57.33	(112.25)	-	-	-	13.08	11,430.11
2019	7,151.00	93.23	57.33	(112.25)	-	-	-	66.52	11,738.38
2020	6,872.91	93.23	57.33	(112.25)	-	(137.90)	(124.86)	(58.61)	10,778.05
2021	6,991.17	93.23	57.33	(112.25)	-	-	-	(52.19)	11,227.78
2022	7,093.10	93.23	57.33	(112.25)	198.33	-	-	24.15	11,965.13
2023	7,057.73	93.23	57.33	(112.25)	-	-	-	187.14	12,375.53
2024	7,011.89	93.23	57.33	(112.25)	-	-	-	-	12,285.22
2025	6,944.89	93.23	57.33	(112.25)	-	-	-	-	12,344.46
2026	6,905.08	93.23	57.33	(112.25)	-	-	-	-	12,418.16
2027	6,868.87	93.23	57.33	(112.25)	-	-	-	-	12,498.34
2028	6,838.04	93.23	57.33	(112.25)	-	-	-	-	12,610.08
2029	6,787.13	93.23	57.33	(112.25)	-	-	-	-	12,657.75
2030	6,706.91	93.23	57.33	(112.25)	-	-	-	-	12,678.66
2031	6,635.27	93.23	57.33	(112.25)	-	-	-	-	12,695.42
2032	6,599.42	93.23	57.33	(112.25)	-	-	-	-	12,828.51
2033	6,547.15	93.23	57.33	(112.25)	-	-	-	-	12,854.87

Regression Coefficients

Variable	MStructSmlGen.WtXHeat	MStructSmlGen.WtXCool	MStructSmlGen.WtXOther	MBin.Mar	MBin.Sep	MBin.Dec	MBin.May20	MBin.Jun20	MBin.Oct22	SMA(1)
Coefficient	0.855	0.302	0.714	93.228	57.333	-112.254	-137.899	-124.856	198.332	0.545
StdErr	0.036	0.045	0.022	22.326	23.672	21.203	36.842	36.252	43.143	0.092
T-Stat	23.811	6.655	32.965	4.176	2.422	-5.294	-3.743	-3.444	4.597	5.927
P-Value	0.00%	0.00%	0.00%	0.01%	1.71%	0.00%	0.03%	0.08%	0.00%	0.00%

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	SAE model Regression Sales (kWh / HH)	Forecasted Customer Count	Forecast without HP and without DSM (GWh)	NSPI and other Programs				Before future DSM	DSM (GWh)	After DSM
				All Small General Programs (GWh)	Solar PV (GWh)	EV (GWh)	Total Programs (GWh)	**Total SAE + adjsutments outside model**		**Final Sales**
2013	10,857.6	23,774.4	258.1					**258.1**		**258.1**
2014	10,589.3	23,946.9	253.6					**253.6**		**253.6**
2015	11,003.8	24,406.8	268.6					**268.6**		**268.6**
2016	11,036.4	24,755.2	273.2					**273.2**		**273.2**
2017	11,014.2	25,089.8	276.3					**276.3**		**276.3**
2018	11,430.1	25,360.8	289.9					**289.9**		**289.9**
2019	11,738.4	25,535.1	299.7					**299.7**		**299.7**
2020	10,778.1	25,733.5	277.4					**277.4**		**277.4**
2021	11,227.8	25,932.9	291.2					**291.2**		**291.2**
2022	11,965.1	26,141.3	312.8		(0.6)	0.2		**312.8**		**312.8**
2023	12,375.5	26,340.7	326.0		(1.3)	0.5	(0.8)	**325.2**	(1.8)	**323.4**
2024	12,285.2	26,604.1	326.8		(2.1)	1.8	(0.3)	**326.5**	(4.6)	**321.9**
2025	12,344.5	26,870.1	331.7		(3.1)	3.9	0.8	**332.5**	(7.6)	**324.9**
2026	12,418.2	27,138.8	337.0		(4.0)	7.2	3.2	**340.2**	(9.9)	**330.3**
2027	12,498.3	27,410.2	342.6		(5.2)	12.0	6.8	**349.4**	(12.2)	**337.2**
2028	12,610.1	27,684.3	349.1		(6.5)	18.7	12.2	**361.3**	(14.8)	**346.5**
2029	12,657.7	27,961.1	353.9		(8.1)	27.2	19.1	**373.0**	(16.9)	**356.1**
2030	12,678.7	28,240.7	358.1		(9.9)	36.2	26.3	**384.4**	(19.0)	**365.4**
2031	12,695.4	28,523.1	362.1		(11.9)	46.0	34.1	**396.2**	(21.0)	**375.3**
2032	12,828.5	28,808.3	369.6		(14.1)	56.6	42.5	**412.1**	(22.9)	**389.2**
2033	12,854.9	29,096.4	374.0		(16.5)	68.1	51.6	**425.6**	(24.7)	**400.9**

Small Gen load post regression

	Average Us	Customer Fc	Load from I	EV (GWh)	Solar (GWh	Small Gen S	DSM (GWh)	Small Gen Sales with	Total DSM at the n	DSM captured by end uses
2023	12,376	26,341	326	1	(1)	325	(2)	323	(5)	(3)
2033	12,855	29,096	374	68	(17)	426	(25)	401	(62)	(37)
Change to load			14.8%	20.8%	-4.7%	30.9%	-7.0%	24.0%		

Small Gen Average Use - Regression (includes coefficients)

	Xheat	Xcool	Xother	Binaries	ARMA	Total Average Use
2023	4,578	514	7,058	38	187	12,376
2033	5,662	607	6,547	38	-	12,855
Change to	8.8%	0.8%	-4.1%	0.0%	-1.5%	3.9%

Small Gen Intensities - Inputs to Regression

Xheat Inputs

	Heating	HeatUse Var	Coefficient	Scaling Fac	Total Xheat
2023	60,706	1.26	0.855	0.070	4,578
2033	71,670	1.32	0.855	0.070	5,662
Change to	18.9%	4.8%	0.0%	0.0%	23.7%

Xcool Inputs

	Cooling	CoolUse Var	Coefficient	Scaling Fac	Total Xcool
2023	36,324	1.34	0.302	0.035	514
2033	35,035	1.64	0.302	0.035	607
Change to	-4.3%	22.4%	0.0%	0.0%	18.0%

Xother Inputs

	Vent	EWHeat	Cooking	Refrig	Light	Office	Misc	OtherUse	Coeff	Scaling Factor	Total Xother
2023	12,024	1,968	1,943	22,741	55,020	13,188	33,725	14.06	0.714	0.005	7,058
2033	9,057	2,266	1,814	21,070	38,594	14,026	32,649	15.35	0.714	0.005	6,547
Change to	-2.3%	0.2%	-0.1%	-1.3%	-12.8%	0.7%	-0.8%	9.2%	0.0%	0.0%	-7.2%

Request IR-37:

Appendix B: General Service Model (pp 15-20)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full results used to produce the commercial model coefficients and statistics tables.

(b) Please provide in electronic spreadsheet format the detailed end-use intensity data and cite its derivation.

(c) Please provide in electronic spreadsheet format the calculation of the XHeat, XCool and XOther variables.

(d) For the XCool variable please provide the underlying factors (penetration, usage, etc.) driving the increase of 20.4% for the CoolUse Variable.

(e) Please provide in electronic spreadsheet format the source and calculations of the values in the tables on pages 17-18.

Response IR-37:

(a) Please refer to 2023 Load Forecast Report Attachment 7 - General Model, filed electronically, for details.

(b) Please refer to 2023 Load Forecast Report Attachment 3 - General Intensities, filed electronically, for details.

(c) All calculations are completed within Metrix ND, the forecasting software used by NS Power. Input values, coefficients and outputs can be found in 2023 Load Forecast Report

Attachment 7 - General Model, filed electronically. The components of the calculations are provided in Attachment 1.

(d) The increase is driven by (multiplicative factor) the economic growth component of the Cool Use variable, non-manufacturing GDP (as forecasted by The Conference Board of Canada), and annual CDD (includes warming trend explained in the Load Forecasting Report), which increase throughout the forecast period.

(e) Please refer to Attachment 1 to obtain sources and calculations of the tables in pages Appendix B: 19-20 (page 18 has no table).

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	Heating Indices (kWh / HH)		Cooling Indices (kWh / HH)	
Year	GenIndices.Heating	AContrib2Sales.GenHeatUse	GenIndices.Cooling	AContrib2Sales.GenCoolUse
2013	604,692.95	1.16	329,531.46	1.14
2014	595,455.52	1.14	327,385.43	1.00
2015	581,601.60	1.20	325,670.72	1.21
2016	572,450.96	1.15	324,209.77	1.24
2017	563,736.05	1.16	323,577.51	1.17
2018	559,729.48	1.21	321,469.78	1.46
2019	555,751.39	1.29	319,573.85	1.23
2020	551,801.57	1.17	317,948.22	1.24
2021	547,879.82	1.14	316,146.76	1.40
2022	547,394.71	1.18	314,372.84	1.53
2023	548,424.52	1.30	312,579.82	1.38
2024	550,739.90	1.32	310,882.97	1.42
2025	554,149.23	1.32	309,404.77	1.46
2026	558,502.26	1.33	308,085.63	1.50
2027	559,039.96	1.35	306,904.39	1.54
2028	564,767.08	1.36	305,856.97	1.58
2029	571,111.45	1.37	304,937.82	1.61
2030	585,272.00	1.38	303,964.26	1.65
2031	600,353.90	1.39	303,105.77	1.69
2032	615,208.12	1.41	302,363.06	1.72
2033	635,079.81	1.42	301,719.53	1.76

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

	Other Indices (kWh / HH)								
Year	GenIndices.Vent	GenIndices.EWHea	GenIndices.Cooking	GenIndices.Refrig	GenIndices.Ligh	GenIndices.Office	GenIndices.Misc	GenIndices.PV	AContrib2Sales.GenOtherUse
2013	131,514.27	18,158.85	19,521.39	228,280.44	678,542.46	124,192.19	347,591.00	0.00	12.50
2014	128,839.10	17,854.37	19,309.34	227,100.58	652,610.50	123,852.33	341,095.24	0.00	12.58
2015	126,370.77	17,578.24	19,101.41	225,671.18	632,040.13	123,219.80	335,604.06	0.00	12.66
2016	124,064.24	17,306.09	18,966.09	224,489.64	616,146.86	122,493.06	331,287.10	0.00	12.87
2017	121,891.53	17,008.93	18,833.70	223,844.19	603,405.04	122,016.20	325,819.17	0.00	13.09
2018	119,904.13	16,718.83	18,669.60	221,931.81	583,141.83	121,602.93	319,582.38	0.00	13.33
2019	118,040.15	16,444.65	18,508.26	220,445.54	560,824.12	121,302.85	315,653.96	0.00	13.64
2020	115,957.80	16,191.84	18,453.52	218,025.84	534,767.29	121,737.42	320,423.10	0.00	13.44
2021	113,939.76	15,948.59	18,366.11	214,633.69	510,440.45	121,934.86	320,530.69	0.00	13.95
2022	112,016.55	15,693.78	18,108.72	211,950.14	490,562.31	121,825.08	315,436.39	0.00	14.37
2023	110,269.00	15,464.25	17,990.29	209,998.98	472,995.06	121,867.02	311,648.66	0.00	14.54
2024	108,739.00	15,246.73	17,873.38	208,431.40	457,140.79	122,223.27	309,804.85	0.00	14.75
2025	107,230.27	15,050.25	17,792.22	206,430.11	443,406.15	122,813.72	308,240.17	0.00	14.91
2026	103,562.01	14,902.74	17,678.13	204,554.55	431,468.23	123,464.61	307,045.93	0.00	15.13
2027	100,151.27	14,759.77	17,599.44	202,796.81	421,052.12	124,004.86	305,987.25	0.00	15.32
2028	96,978.96	14,605.11	17,487.68	201,254.22	408,143.09	124,791.36	304,832.35	0.00	15.54
2029	94,032.43	14,446.77	17,342.74	199,806.94	396,850.58	125,559.48	303,816.14	0.00	15.68
2030	91,136.34	14,313.42	17,266.98	198,246.75	377,619.69	126,574.37	303,207.84	0.00	15.87
2031	88,438.16	14,176.81	17,157.86	196,859.35	360,399.62	127,509.16	302,709.39	0.00	16.06
2032	85,924.35	14,051.09	17,083.56	195,606.32	345,130.51	128,554.06	302,162.63	0.00	16.30
2033	83,582.78	13,928.35	16,975.76	194,271.90	331,779.68	129,606.92	301,697.91	0.00	16.46

	Other Regression Variables						
Year	AContrib2Sales.Feb18	AContrib2Sales.May20	AContrib2Sales.Jun20	ntrib2Sales.O	ntrib2Sales.S	ntrib2Sales.C	AContrib2Sales.GenSalesARMA
2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	0.00	0.00	0.00	0.00	0.00	0.00	8,156.93
2015	0.00	0.00	0.00	0.00	0.00	0.00	14,564.56
2016	0.00	0.00	0.00	0.00	0.00	0.00	9,977.66
2017	0.00	0.00	0.00	0.00	0.00	0.00	-5,115.49
2018	1.00	0.00	0.00	0.00	0.00	0.00	-699.28
2019	0.00	0.00	0.00	0.00	0.00	0.00	-9,789.63
2020	0.00	1.00	1.00	0.00	0.00	10.00	-15,007.68
2021	0.00	0.00	0.00	0.00	0.00	11.00	14,371.64
2022	0.00	0.00	0.00	1.00	1.00	6.38	-15,003.55
2023	0.00	0.00	0.00	0.00	0.00	2.25	-3,141.22
2024	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2025	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2026	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2027	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2028	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2029	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2030	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2031	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2032	0.00	0.00	0.00	0.00	0.00	2.25	0.00
2033	0.00	0.00	0.00	0.00	0.00	2.25	0.00

	Regression Sales Results Out of Monthly Model (kWh / HH)
Year	AContrib2Sales.GenMetrixSales
2013	2,467,465.60
2014	2,414,804.67
2015	2,426,107.95
2016	2,391,516.17
2017	2,371,437.83
2018	2,439,691.15
2019	2,414,199.09
2020	2,185,631.72
2021	2,285,722.54
2022	2,323,158.50
2023	2,377,560.66
2024	2,386,869.17
2025	2,388,613.23
2026	2,400,097.48
2027	2,406,524.18
2028	2,419,256.57
2029	2,421,317.30
2030	2,428,668.27
2031	2,440,593.60
2032	2,464,146.40
2033	2,480,881.09

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	GenIndices Heating	GenIndices Cooling	GenIndices Others	XHeat	XCool	XOther	Feb 18	May 20	Jun 20	22-Oct
2012	604,693.0	329,531.5	1,547,800.6	702,054.6	138,853.7	1,741,281.2	0	0	0	0
2013	595,455.5	327,385.4	1,510,661.5	680,867.7	121,557.8	1,710,468.8	0	0	0	0
2014	581,601.6	325,670.7	1,479,585.6	699,544.6	145,537.7	1,685,718.6	0	0	0	0
2015	572,451.0	324,209.8	1,454,753.1	657,356.9	149,161.3	1,684,728.9	0	0	0	0
2016	563,736.1	323,577.5	1,432,818.8	654,999.3	140,423.9	1,687,582.1	0	0	0	0
2017	559,729.5	321,469.8	1,401,551.5	678,470.5	173,760.3	1,681,601.5	1	0	0	0
2018	555,751.4	319,573.9	1,371,219.5	719,170.1	145,248.9	1,683,806.4	0	0	0	0
2019	551,801.6	317,948.2	1,345,556.8	647,213.6	146,314.6	1,627,211.3	0	1	1	0
2020	547,879.8	316,146.8	1,315,794.2	627,212.8	163,765.2	1,652,313.5	0	0	0	0
2021	547,394.7	314,372.8	1,285,593.0	647,524.2	178,457.3	1,662,530.1	0	0	0	1
2022	548,424.5	312,579.8	1,260,233.3	713,615.5	159,929.4	1,649,254.7	0	0	0	0
2023	550,739.9	310,883.0	1,239,459.4	724,680.1	163,411.5	1,644,917.2	0	0	0	0
2024	554,149.2	309,404.8	1,220,962.9	732,047.8	167,331.6	1,638,715.6	0	0	0	0
2025	558,502.3	308,085.6	1,202,676.2	745,572.6	171,168.8	1,637,422.2	0	0	0	0
2026	559,040.0	306,904.4	1,186,351.5	752,842.3	174,858.2	1,635,868.5	0	0	0	0
2027	564,767.1	305,857.0	1,168,092.8	770,235.0	178,282.3	1,633,300.3	0	0	0	0
2028	571,111.5	304,937.8	1,151,855.1	780,983.5	181,920.0	1,625,201.4	0	0	0	0
2029	585,272.0	303,964.3	1,128,365.4	807,055.0	185,516.2	1,611,303.1	0	0	0	0
2030	600,353.9	303,105.8	1,107,250.4	834,978.2	189,159.7	1,600,384.8	0	0	0	0
2031	615,208.1	302,363.1	1,088,512.5	867,714.1	192,872.5	1,597,005.6	0	0	0	0
2032	635,079.8	301,719.5	1,071,843.3	899,349.2	196,664.0	1,587,910.7	0	0	0	0

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	22-Sep	Covid	ARMA	XHeatNew	XCoolNew	XOtherNew	Feb 18 New	May 20 New	Jun 20 New	Oct 22`	22-Sep	Covid	ARMA new	Total (kWh)
2012	0	0	0	525,136.81	99,141.55	1,844,016.84	-	-	-	-	-	-	-	2,468,295.21
2013	0	0	8156.93	509,289.01	86,792.26	1,811,386.45	-	-	-	-	-	-	8,156.93	2,415,624.65
2014	0	0	14564.56	523,259.35	103,913.91	1,785,176.04	-	-	-	-	-	-	14,564.56	2,426,913.86
2015	0	0	9977.66	491,702.95	106,501.17	1,784,127.89	-	-	-	-	-	-	9,977.66	2,392,309.67
2016	0	0	-5115.49	489,939.46	100,262.67	1,787,149.45	-	-	-	-	-	-	(5,115.49)	2,372,236.08
2017	0	0	-699.28	507,495.93	124,064.83	1,780,816.03	28,808.83	-	-	-	-	-	(699.28)	2,440,486.35
2018	0	0	-9789.63	537,939.22	103,707.69	1,783,151.02	-	-	-	-	-	-	(9,789.63)	2,415,008.30
2019	0	10	-15007.7	484,115.76	104,468.64	1,723,216.79	-	(29,683.90)	(22,742.87)	-	-	(57,963.85)	(15,007.68)	2,186,402.88
2020	0	11	14371.64	469,155.19	116,928.35	1,749,800.00	-	-	-	-	-	(63,760.24)	14,371.64	2,286,494.94
2021	1	6.38	-15003.6	484,348.06	127,418.53	1,760,619.39	-	-	-	22,423.85	(18,919.30)	(36,980.94)	(15,003.55)	2,323,906.05
2022	0	2.25	-3141.22	533,784.37	114,189.59	1,746,560.69	-	-	-	-	-	(13,041.87)	(3,141.22)	2,378,351.57
2023	0	2.25	0	542,060.70	116,675.83	1,741,967.33	-	-	-	-	-	(13,041.87)	-	2,387,661.99
2024	0	2.25	0	547,571.72	119,474.79	1,735,399.81	-	-	-	-	-	(13,041.87)	-	2,389,404.45
2025	0	2.25	0	557,688.30	122,214.50	1,734,030.15	-	-	-	-	-	(13,041.87)	-	2,400,891.09
2026	0	2.25	0	563,126.07	124,848.77	1,732,384.78	-	-	-	-	-	(13,041.87)	-	2,407,317.76
2027	0	2.25	0	576,135.77	127,293.55	1,729,665.04	-	-	-	-	-	(13,041.87)	-	2,420,052.49
2028	0	2.25	0	584,175.65	129,890.87	1,721,088.28	-	-	-	-	-	(13,041.87)	-	2,422,112.94
2029	0	2.25	0	603,677.12	132,458.56	1,706,369.95	-	-	-	-	-	(13,041.87)	-	2,429,463.77
2030	0	2.25	0	624,563.70	135,060.03	1,694,807.48	-	-	-	-	-	(13,041.87)	-	2,441,389.34
2031	0	2.25	0	649,050.18	137,710.94	1,691,228.92	-	-	-	-	-	(13,041.87)	-	2,464,948.18
2032	0	2.25	0	672,713.22	140,418.07	1,681,597.39	-	-	-	-	-	(13,041.87)	-	2,481,686.81

Regression Coefficients

Variable	MStructGen.WtXHeat	MStructGen.WtXCool	MStructGen.WtXOther	MBin.Feb18	MBin.May20	MBin.Jun20	MBin.Oct22	MBin.COV	MBin.Sep2	SMA(1)
Coefficient	0.748	0.714	1.059	28808.83	-29683.9	-22742.9	22423.85	-5796.39	-18919.3	0.39
StdErr	0.033	0.07	0.02	6110.783	6224.254	6212.852	6675.915	1903.894	6796.019	0.093
T-Stat	22.453	10.199	53.877	4.714	-4.769	-3.661	3.359	-3.044	-2.784	4.188
P-Value	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.11%	0.0029	0.0063	0.0001

			NSPI and other Programs				Before future DSM		After DSM	
Year	SAE model Regression Sales (kWh / HH)	Forecast without HP and without DSM (GWh)	RTR	EV	Solar PV (GWh)	Total Programs (GWh)	**Total SAE + adjsutments outside model**	DSM (GWh)	**Final Sales**
2013	2,468,295.2	2,468.3					**2,468.3**		**2,468.3**
2014	2,415,624.7	2,415.6					**2,415.6**		**2,415.6**
2015	2,426,913.9	2,426.9					**2,426.9**		**2,426.9**
2016	2,392,309.7	2,392.3					**2,392.3**		**2,392.3**
2017	2,372,236.1	2,372.2					**2,372.2**		**2,372.2**
2018	2,440,486.3	2,440.5					**2,440.5**		**2,440.5**
2019	2,415,008.3	2,415.0					**2,415.0**		**2,415.0**
2020	2,186,402.9	2,186.4					**2,186.4**		**2,186.4**
2021	2,286,494.9	2,286.5					**2,286.5**		**2,286.5**
2022	2,323,906.0	2,323.9					**2,323.9**		**2,323.9**
2023	2,378,351.6	2,378.4		2.2	(4.0)	(1.8)	**2,376.6**	(12.6)	**2,364.0**
2024	2,387,662.0	2,387.7	(64.1)	7.3	(6.4)	(63.2)	**2,324.4**	(32.7)	**2,291.8**
2025	2,389,404.5	2,389.4	(64.1)	15.5	(9.2)	(57.8)	**2,331.6**	(53.2)	**2,278.4**
2026	2,400,891.1	2,400.9	(64.1)	28.6	(12.0)	(47.5)	**2,353.4**	(69.6)	**2,283.8**
2027	2,407,317.8	2,407.3	(64.1)	47.9	(15.5)	(31.7)	**2,375.6**	(85.7)	**2,289.9**
2028	2,420,052.5	2,420.1	(64.1)	74.8	(19.6)	(8.9)	**2,411.1**	(103.9)	**2,307.3**
2029	2,422,112.9	2,422.1	(64.1)	108.8	(24.3)	20.4	**2,442.5**	(118.9)	**2,323.6**
2030	2,429,463.8	2,429.5	(64.1)	144.9	(29.7)	51.2	**2,480.6**	(133.7)	**2,347.0**
2031	2,441,389.3	2,441.4	(64.1)	184.0	(35.6)	84.3	**2,525.7**	(147.5)	**2,378.1**
2032	2,464,948.2	2,464.9	(64.1)	226.4	(42.3)	120.0	**2,585.0**	(161.0)	**2,424.0**
2033	2,481,686.8	2,481.7	(64.1)	272.4	(49.6)	158.7	**2,640.4**	(173.6)	**2,466.8**

Gen Demand load post regression

	Load from Regre	RTR	EV	Solar	Gen Dema	DSM	Gen Demand Sales (wi	Total Dem	DSM captured by End uses
2023	2,378	-	2	(4)	2,377	(13)	2,364	(32)	(19)
2033	2,482	(64)	272	(50)	2,640	(174)	2,467	(437)	(264)
Change to	4.3%	-2.7%	11.4%	-1.9%	11.1%	-6.8%	4.4%		

Gen Demand - Regression (includes coefficients)

	Xheat	Xcool	Xother	Binaries	ARMA	Total Sales
2023	533,784	114,190	1,746,561	(13,042)	(3,141)	2,378,352
2033	672,713	140,418	1,681,597	(13,042)	-	2,481,687
Change to	5.8%	1.1%	-2.7%	0.0%	0.1%	4.3%

Gen Demand Intensities - Inputs to Regression

Xheat Inputs

	Heating	HeatUse Va	Coefficient	Total Xheat
2023	548,425	1.30	0.748	533,784
2033	635,080	1.42	0.748	672,713
Change to	17.2%	8.8%	0.0%	26.0%

Xcool Inputs

	Cooling	CoolUse Va	Coefficient	Scaling Fac	Total Xcool
2023	312,580	1.38	0.714	0.370	114,190
2033	301,720	1.76	0.714	0.370	140,418
Change to	-4.4%	27.4%	0.0%	0.0%	23.0%

Xother Inputs

	Vent	EWHeat	Cooking	Refrig	Light	Office	Misc	OtherUse '	Coeff	Scaling Factor	Total Xother
2023	110,269	15,464	17,990	209,999	472,995	121,867	311,649	14.54	1.059	0.090	1,746,561
2033	83,583	13,928	16,976	194,272	331,780	129,607	301,698	16.46	1.059	0.090	1,681,597
Change to	-2.4%	-0.1%	-0.1%	-1.4%	-12.7%	0.7%	-0.9%	13.2%	0.0%	0.0%	-3.7%

Request IR-38:

Appendix B: Small Industrial Model (pp 21-23)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full results used to produce the model coefficients and statistics tables.

(b) Please explain why "ManGDP" was chosen as the long-term driver for this forecast, whether any other variables were considered such as employment, and why they were rejected.

Response IR-38:

(a) All calculations for the Small Industrial forecast are completed within Metrix ND, the forecasting software used by NS Power. Please refer to 2023 Load Forecast Report Attachment 8 Small Industrial Model inputs, coefficients, and outputs (filed electronically).

(b) Starting in 2015, NS Power started testing different economic indicators (and combinations) in the industrial forecast to increase model fit and predictability. For the 2023 forecast period ManGDP was found to be a satisfactory predictor in the Small Industrial class based on model statistics (Appendix B).

Request IR-39:

Appendix B: Medium Industrial Model (pp 24-26)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full results used to produce the model coefficients and statistics tables.

(b) Please explain why Manufacturing Employment was chosen as the long-term driver for this forecast, whether any other variables were considered, and why they were rejected.

Response IR-39:

(a) All calculations for the Medium Industrial forecast are completed within Metrix ND, the forecasting software used by NS Power. Please refer to 2023 Load Forecast Report Attachment 9 Medium Industrial Model, filed electronically, for the inputs, coefficients, and outputs.

(b) In 2015, NS Power started testing different economic indicators (and combinations) in the Industrial forecast to increase model fit and predictability. For the 2023 forecast period, Manufacturing Employment (ManEmp) was found to be a satisfactory predictor in the Medium Industrial class based on model statistics (Appendix B).

Request IR-40:

Appendix B: Combined Model for Commercial and Industrial DSM Coefficient (pp 27-28)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full results used to produce the model coefficients and statistics tables.

(b) Please describe the method and data used to weigh the X variable.

(c) Please explain why the X variables from the General Service model were used to represent both commercial and industrial customers?

(d) Were other alternatives considered? If so, please describe and indicate why this approach was preferred.

Response IR-40:

(a) Please refer to Synapse IR-17 (b).

(b-d) The General Service model was used as it constitutes the bulk of the Commercial class (77 percent of the commercial class in 2022, 62 percent if Small and Medium Industrial are also included). No other alternatives were considered.

Request IR-41:

Appendix B: Peak Forecast (pp 29-33)

(a) Please provide in electronic spreadsheet format the data and the statistical model parameters and the full results used to produce the model coefficients and statistics tables.

(b) Please provide the customer load values used to construct the aggregate HeatVar, CoolVar, and BaseVar values both for the model development and the forecast.

(c) Please provide the details of the large customer class's energy and coincident load factors. Please provide also the historical coincident peak load factors associated with this load.

Response IR-41:

(a) Please refer to the 2023 Load Forecast Report Attachment 10: Peak Model Inputs filed electronically. All calculations in the peak forecast are completed within Metrix ND, the forecasting software used by NS Power.

(b) Please refer to Attachment 1 for the input load components HeatVar, CoolVar, and BaseVar.

(c) Please refer to the table below for the coincident peak load factors used in calculating the peak contributions for the large customer rate classes. The values used are the historical coincident load factors for 2023. The large customer class energy values used to create the peak forecast can be found on the "Energy Annual Profile" tab in 2023 Load Forecast Report Attachment 4 10-Year Forecast Classes PCONFIDENTIAL ELECTRONIC ONLY".

Large classes	**Load Factor (Percent)**
Large General	86.6
Large Industrial	93.6
L. I. Interruptible	88.7
GR & LF	81.3
Shore Power	0.00
Municipal	73.5

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REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Month	ResEndUse.ResHeat	NResEndUse.SmlGenHeat	NResEndUse.GenHeat	mVars.HeatLoad	mVars.Days	mVars.Heat_AvgMW	mPkDayWthr.PkHDDIdx	mVars.Heat_Var
2013	1	299,837.2	12,431.4	86,010.9	398,279.5	31.0	535.3	1.2	661.9
2013	2	269,076.5	11,147.6	77,151.5	357,375.5	28.0	531.8	1.4	743.8
2013	3	264,018.5	10,924.7	75,650.3	350,593.6	31.0	471.2	1.0	491.4
2013	4	186,958.4	7,740.1	53,562.1	248,260.6	30.0	344.8	0.7	253.7
2013	5	123,889.0	5,126.1	35,477.9	164,493.0	31.0	221.1	0.4	85.4
2013	6	53,425.9	2,210.8	15,286.5	70,923.3	30.0	98.5	-	-
2013	7	8,517.5	353.1	2,435.6	11,306.2	31.0	15.2	-	-
2013	8	3,064.9	127.2	876.1	4,068.2	31.0	5.5	-	-
2013	9	30,530.8	1,266.8	8,726.3	40,524.0	30.0	56.3	-	-
2013	10	97,763.9	4,052.1	27,945.7	129,761.6	31.0	174.4	0.7	126.7
2013	11	175,723.6	7,274.5	50,207.8	233,205.8	30.0	323.9	0.8	270.0
2013	12	254,740.5	10,558.1	72,789.7	338,088.3	31.0	454.4	1.3	571.7
2014	1	304,845.3	12,882.1	84,873.5	402,600.9	31.0	541.1	1.4	770.2
2014	2	273,656.8	11,575.0	76,222.4	361,454.3	28.0	537.9	1.2	646.5
2014	3	268,421.3	11,346.2	74,808.1	354,575.6	31.0	476.6	1.2	575.6
2014	4	190,010.9	8,036.9	53,034.5	251,082.3	30.0	348.7	0.8	260.5
2014	5	125,882.7	5,331.1	35,164.8	166,378.7	31.0	223.6	0.7	144.3
2014	6	54,240.1	2,297.6	15,168.2	71,705.8	30.0	99.6	0.1	9.4
2014	7	8,643.9	366.2	2,419.6	11,429.7	31.0	15.4	-	-
2014	8	3,109.5	131.5	870.3	4,111.3	31.0	5.5	-	-
2014	9	30,968.9	1,313.4	8,663.6	40,945.8	30.0	56.9	-	-
2014	10	99,163.6	4,207.5	27,732.8	131,104.0	31.0	176.2	0.4	70.3
2014	11	178,253.3	7,566.1	49,804.7	235,624.1	30.0	327.3	0.8	255.2
2014	12	258,479.2	10,988.0	72,180.4	341,647.5	31.0	459.2	1.1	498.4
2015	1	308,443.8	13,148.6	83,425.0	405,017.4	31.0	544.4	1.2	676.8
2015	2	276,880.2	11,844.1	74,876.8	363,601.1	28.0	541.1	1.2	657.6
2015	3	271,601.1	11,632.7	73,468.3	356,702.0	31.0	479.4	1.1	533.4
2015	4	192,381.3	8,245.7	52,086.2	252,713.2	30.0	351.0	0.9	299.6
2015	5	127,502.4	5,475.6	34,535.5	167,513.5	31.0	225.2	0.6	131.6
2015	6	54,954.6	2,360.1	14,894.0	72,208.7	30.0	100.3	0.4	42.8
2015	7	8,762.7	376.9	2,374.6	11,514.2	31.0	15.5	-	-
2015	8	3,151.3	135.8	854.6	4,141.7	31.0	5.6	-	-
2015	9	31,374.7	1,355.7	8,514.5	41,244.9	30.0	57.3	-	-
2015	10	100,467.1	4,345.8	27,283.2	132,096.1	31.0	177.6	0.7	119.5
2015	11	180,544.3	7,824.3	49,043.4	237,412.0	30.0	329.7	0.9	282.5
2015	12	261,696.1	11,363.5	71,132.9	344,192.5	31.0	462.6	1.1	506.8
2016	1	313,810.4	13,829.2	82,944.6	410,584.2	31.0	551.9	1.0	559.8
2016	2	291,207.6	12,856.5	77,035.2	381,099.3	29.0	547.6	1.1	604.0
2016	3	276,222.7	12,224.0	73,142.8	361,589.5	31.0	486.0	1.0	505.5
2016	4	195,674.7	8,681.8	51,862.1	256,218.6	30.0	355.9	1.0	351.2
2016	5	129,564.0	5,766.5	34,398.1	169,728.6	31.0	228.1	0.4	101.0
2016	6	55,834.8	2,484.8	14,846.5	73,166.0	30.0	101.6	0.3	25.1
2016	7	8,902.9	396.7	2,370.0	11,669.6	31.0	15.7	-	-
2016	8	3,204.1	142.9	853.5	4,200.6	31.0	5.7	-	-
2016	9	31,942.7	1,428.3	8,510.2	41,881.2	30.0	58.2	-	-

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Year	Month	ResEndUse.ResHeat	NResEndUse.SmlGenHeat	NResEndUse.GenHeat	mVars.HeatLoad	mVars.Days	mVars.Heat_AvgMW	mPkDayWthr.PkHDDIdx	mVars.Heat_Var
2016	10	102,388.2	4,581.0	27,293.7	134,262.9	31.0	180.5	0.5	87.2
2016	11	184,125.3	8,260.1	49,100.5	241,485.9	30.0	335.4	0.6	215.5
2016	12	267,237.6	12,006.2	71,267.4	350,511.2	31.0	471.1	1.3	609.7
2017	1	322,178.2	14,481.7	83,174.8	419,834.7	31.0	564.3	1.2	700.1
2017	2	289,435.2	13,020.5	74,798.2	377,253.9	28.0	561.4	1.1	594.7
2017	3	284,093.9	12,794.0	73,475.2	370,363.1	31.0	497.8	1.1	564.0
2017	4	201,304.1	9,089.5	52,130.4	262,524.0	30.0	364.6	0.7	270.8
2017	5	133,378.8	6,037.3	34,574.8	173,991.0	31.0	233.9	0.6	132.4
2017	6	57,522.5	2,609.6	14,924.9	75,056.9	30.0	104.3	-	-
2017	7	9,175.4	417.1	2,382.9	11,975.4	31.0	16.1	-	-
2017	8	3,302.8	149.9	857.7	4,310.4	31.0	5.8	-	-
2017	9	32,926.1	1,494.5	8,548.2	42,968.8	30.0	59.7	-	-
2017	10	105,465.7	4,786.7	27,394.4	137,646.8	31.0	185.0	0.5	97.0
2017	11	189,655.5	8,613.2	49,248.2	247,517.0	30.0	343.8	0.8	273.3
2017	12	275,276.1	12,497.2	71,462.3	359,235.6	31.0	482.8	1.2	584.7
2018	1	328,861.0	15,326.4	84,043.5	428,231.0	31.0	575.6	1.2	701.7
2018	2	295,364.3	13,778.9	75,517.9	384,661.1	28.0	572.4	1.2	668.0
2018	3	290,024.4	13,542.1	74,178.9	377,745.4	31.0	507.7	1.0	480.4
2018	4	205,511.0	9,623.4	52,611.5	267,745.8	30.0	371.9	0.8	285.5
2018	5	136,267.5	6,388.3	34,916.9	177,572.6	31.0	238.7	0.5	114.6
2018	6	58,773.7	2,761.2	15,073.2	76,608.1	30.0	106.4	0.4	42.1
2018	7	9,375.6	440.3	2,405.8	12,221.7	31.0	16.4	-	-
2018	8	3,373.9	158.7	867.2	4,399.8	31.0	5.9	-	-
2018	9	33,617.1	1,583.9	8,654.9	43,855.9	30.0	60.9	-	-
2018	10	107,701.1	5,088.0	27,770.6	140,559.7	31.0	188.9	0.5	100.7
2018	11	193,572.8	9,171.7	49,993.1	252,737.6	30.0	351.0	1.1	371.6
2018	12	280,795.9	13,336.0	72,636.5	366,768.3	31.0	493.0	1.1	521.8
2019	1	337,263.1	16,355.9	85,559.7	439,178.7	31.0	590.3	1.1	651.1
2019	2	302,869.0	14,714.3	76,986.0	394,569.3	28.0	587.2	1.2	730.8
2019	3	297,154.1	14,453.2	75,697.4	387,304.7	31.0	520.6	1.2	603.3
2019	4	210,526.4	10,266.1	53,783.8	274,576.2	30.0	381.4	0.6	214.4
2019	5	139,512.9	6,821.8	35,719.2	182,053.9	31.0	244.7	0.5	126.7
2019	6	60,170.5	2,947.9	15,439.5	78,557.8	30.0	109.1	0.3	33.7
2019	7	9,592.5	471.5	2,467.5	12,531.5	31.0	16.8	-	-
2019	8	3,452.3	169.0	884.5	4,505.8	31.0	6.1	-	-
2019	9	34,377.9	1,675.2	8,776.9	44,829.9	30.0	62.3	-	-
2019	10	110,059.9	5,351.1	28,007.0	143,418.1	31.0	192.8	0.6	113.2
2019	11	197,774.4	9,578.9	50,118.8	257,472.0	30.0	357.6	0.8	274.6
2019	12	286,747.2	13,829.9	72,408.4	372,985.5	31.0	501.3	1.0	475.0
2020	1	340,732.1	16,765.0	84,788.5	442,285.6	31.0	594.5	1.1	640.8
2020	2	316,304.2	15,503.3	78,443.5	410,250.9	29.0	589.4	1.2	710.8
2020	3	300,081.9	14,635.8	74,155.8	388,873.4	31.0	522.7	0.9	472.7
2020	4	212,626.6	10,331.5	52,346.6	275,304.6	30.0	382.4	0.7	250.4
2020	5	140,904.2	6,833.3	34,576.1	182,313.6	31.0	245.1	0.5	131.7
2020	6	60,766.8	2,936.9	14,846.0	78,549.7	30.0	109.1	-	-

Year	Month	ResEndUse.ResHeat	NResEndUse.SmlGenHeat	NResEndUse.GenHeat	mVars.HeatLoad	mVars.Days	mVars.Heat_AvgMW	mPkDayWthr.PkHDDIdx	mVars.Heat_Var
2020	7	9,691.1	466.7	2,356.9	12,514.6	31.0	16.8	-	-
2020	8	3,489.8	168.6	851.3	4,509.7	31.0	6.1	-	-
2020	9	34,785.2	1,688.6	8,513.4	44,987.2	30.0	62.5	0.2	11.5
2020	10	111,444.6	5,426.3	27,374.5	144,245.5	31.0	193.9	0.6	113.1
2020	11	200,523.6	9,802.5	49,406.6	259,732.7	30.0	360.7	0.8	270.7
2020	12	291,076.4	14,285.7	71,926.8	377,288.9	31.0	507.1	0.9	474.5
2021	1	349,343.3	17,487.6	84,899.4	451,730.3	31.0	607.2	0.9	571.1
2021	2	314,018.6	15,784.3	76,545.2	406,348.1	28.0	604.7	1.1	645.5
2021	3	308,464.6	15,569.9	75,424.4	399,458.9	31.0	536.9	1.1	584.7
2021	4	218,740.3	11,088.3	53,694.0	283,522.5	30.0	393.8	0.6	242.0
2021	5	145,215.2	7,398.6	35,743.5	188,357.3	31.0	253.2	0.5	131.6
2021	6	62,686.7	3,208.7	15,488.3	81,383.6	30.0	113.0	-	-
2021	7	10,006.5	514.9	2,482.3	13,003.7	31.0	17.5	-	-
2021	8	3,600.5	185.5	894.1	4,680.1	31.0	6.3	-	-
2021	9	35,920.1	1,852.0	8,915.4	46,687.5	30.0	64.8	-	-
2021	10	115,047.2	5,946.6	28,593.7	149,587.4	31.0	201.1	0.3	68.5
2021	11	206,913.2	10,716.9	51,448.2	269,078.2	30.0	373.7	0.7	246.0
2021	12	300,707.4	15,605.2	74,695.3	391,007.8	31.0	525.6	1.0	522.6
2022	1	357,427.3	19,191.5	88,479.6	465,098.4	31.0	625.1	1.2	776.0
2022	2	321,154.4	17,263.0	79,565.4	417,982.8	28.0	622.0	1.2	721.6
2022	3	315,370.7	16,991.1	78,198.9	410,560.7	31.0	551.8	1.2	636.8
2022	4	223,685.7	12,077.8	55,513.7	291,277.1	30.0	404.6	0.7	268.5
2022	5	148,392.4	8,030.7	36,854.5	193,277.5	31.0	259.8	0.5	121.0
2022	6	64,061.9	3,473.6	15,921.5	83,457.1	30.0	115.9	-	-
2022	7	10,239.0	556.2	2,543.8	13,339.0	31.0	17.9	-	-
2022	8	3,686.7	200.4	915.8	4,802.9	31.0	6.5	-	-
2022	9	36,752.2	2,000.8	9,125.2	47,878.1	30.0	66.5	-	-
2022	10	117,692.9	6,407.7	29,246.6	153,347.2	31.0	206.1	0.5	95.3
2022	11	211,505.1	11,519.3	52,552.2	275,576.5	30.0	382.8	0.8	285.3
2022	12	306,820.5	16,720.1	76,227.2	399,767.8	31.0	537.3	0.8	416.6
2023	1	364,253.2	20,319.0	90,439.2	475,011.4	31.0	638.5	1.2	793.9
2023	2	326,971.2	18,257.2	81,187.8	426,416.2	28.0	634.6	1.3	796.0
2023	3	320,808.3	17,928.0	79,651.2	418,387.5	31.0	562.4	1.1	620.5
2023	4	227,403.5	12,715.1	56,439.2	296,557.7	30.0	411.9	0.6	263.3
2023	5	150,691.2	8,433.7	37,401.0	196,525.9	31.0	264.2	0.4	110.5
2023	6	64,988.3	3,639.5	16,125.0	84,752.8	30.0	117.7	0.2	19.2
2023	7	10,374.0	580.8	2,570.7	13,525.5	31.0	18.2	-	-
2023	8	3,732.7	209.1	925.2	4,867.0	31.0	6.5	-	-
2023	9	37,159.6	2,084.7	9,219.2	48,463.4	30.0	67.3	-	-
2023	10	118,973.9	6,682.7	29,539.5	155,196.1	31.0	208.6	0.5	108.0
2023	11	213,681.1	12,017.8	53,096.1	278,795.0	30.0	387.2	0.8	302.2
2023	12	309,560.1	17,440.6	77,017.1	404,017.8	31.0	543.0	1.0	537.5
2024	1	370,936.3	21,011.0	91,192.4	483,139.7	31.0	649.4	1.2	804.3
2024	2	344,440.5	19,527.8	84,713.8	448,682.1	29.0	644.7	1.3	805.6
2024	3	326,852.4	18,547.4	80,420.8	425,820.6	31.0	572.3	1.1	631.5

Year	Month	ResEndUse.ResHeat	NResEndUse.SmlGenHeat	NResEndUse.GenHeat	mVars.HeatLoad	mVars.Days	mVars.Heat_AvgMW	mPkDayWthr.PkHDDIdx	mVars.Heat_Var
2024	4	231,666.0	13,158.0	57,023.8	301,847.7	30.0	419.2	0.6	268.0
2024	5	153,565.9	8,730.0	37,815.4	200,111.3	31.0	269.0	0.4	112.5
2024	6	66,229.5	3,768.5	16,315.6	86,313.6	30.0	119.9	0.2	19.6
2024	7	10,562.2	601.5	2,603.1	13,766.8	31.0	18.5	-	-
2024	8	3,798.9	216.5	936.7	4,952.1	31.0	6.7	-	-
2024	9	37,827.4	2,157.7	9,331.4	49,316.5	30.0	68.5	-	-
2024	10	121,124.9	6,914.6	29,893.6	157,933.2	31.0	212.3	0.5	109.9
2024	11	217,582.0	12,430.8	53,723.2	283,736.0	30.0	394.1	0.8	307.6
2024	12	315,415.4	18,034.3	77,914.1	411,363.7	31.0	552.9	1.0	547.3
2025	1	377,907.4	21,803.2	92,433.5	492,144.1	31.0	661.5	1.2	816.3
2025	2	339,470.4	19,601.0	83,069.4	442,140.8	28.0	658.0	1.2	819.1
2025	3	333,273.8	19,258.3	81,589.7	434,121.8	31.0	583.5	1.1	643.8
2025	4	236,320.5	13,666.6	57,880.3	307,867.4	30.0	427.6	0.6	273.3
2025	5	156,721.3	9,070.5	38,401.9	204,193.6	31.0	274.5	0.4	114.8
2025	6	67,621.8	3,916.8	16,577.0	88,115.5	30.0	122.4	0.2	20.0
2025	7	10,789.4	625.4	2,646.1	14,060.9	31.0	18.9	-	-
2025	8	3,882.3	225.2	952.4	5,059.9	31.0	6.8	-	-
2025	9	38,675.1	2,244.9	9,489.7	50,409.6	30.0	70.0	-	-
2025	10	123,893.5	7,196.0	30,406.7	161,496.2	31.0	217.1	0.5	112.4
2025	11	222,653.6	12,940.7	54,658.0	290,252.3	30.0	403.1	0.8	314.6
2025	12	322,909.4	18,780.0	79,288.0	420,977.5	31.0	565.8	1.0	560.1
2026	1	385,283.6	22,636.6	94,253.1	502,173.2	31.0	675.0	1.2	830.0
2026	2	346,049.4	20,344.9	84,675.2	451,069.5	28.0	671.2	1.2	832.8
2026	3	339,687.6	19,984.1	83,138.2	442,809.9	31.0	595.2	1.1	656.7
2026	4	240,837.2	14,178.1	58,958.7	313,973.9	30.0	436.1	0.6	278.7
2026	5	159,696.8	9,407.6	39,104.2	208,208.6	31.0	279.9	0.4	117.1
2026	6	68,897.2	4,061.4	16,874.6	89,833.1	30.0	124.8	0.2	20.4
2026	7	10,991.6	648.4	2,692.7	14,332.7	31.0	19.3	-	-
2026	8	3,954.8	233.4	969.1	5,157.3	31.0	6.9	-	-
2026	9	39,393.5	2,326.8	9,655.1	51,375.4	30.0	71.4	-	-
2026	10	126,184.7	7,458.3	30,934.1	164,577.0	31.0	221.2	0.5	114.5
2026	11	226,752.9	13,411.5	55,601.0	295,765.4	30.0	410.8	0.8	320.6
2026	12	328,828.5	19,461.8	80,648.9	428,939.3	31.0	576.5	1.0	570.7
2027	1	392,368.0	23,279.7	95,219.3	510,867.0	31.0	686.7	1.2	841.6
2027	2	352,384.1	20,921.5	85,535.6	458,841.2	28.0	682.8	1.2	844.4
2027	3	345,878.3	20,549.0	83,975.7	450,403.0	31.0	605.4	1.1	667.9
2027	4	245,207.1	14,577.9	59,547.4	319,332.4	30.0	443.5	0.6	283.5
2027	5	162,581.4	9,672.2	39,491.1	211,744.7	31.0	284.6	0.4	119.1
2027	6	70,136.1	4,175.3	17,040.0	91,351.4	30.0	126.9	0.2	20.7
2027	7	11,188.3	666.5	2,718.9	14,573.7	31.0	19.6	-	-
2027	8	4,025.0	240.0	978.3	5,243.3	31.0	7.1	-	-
2027	9	40,088.6	2,391.8	9,745.7	52,226.2	30.0	72.5	-	-
2027	10	128,395.2	7,666.4	31,219.3	167,280.8	31.0	224.8	0.5	116.4
2027	11	230,696.7	13,785.3	56,104.5	300,586.5	30.0	417.5	0.8	325.8
2027	12	334,506.2	20,003.9	81,365.9	435,875.9	31.0	585.9	1.0	579.9

Year	Month	ResEndUse.ResHeat	NResEndUse.SmlGenHeat	NResEndUse.GenHeat	mVars.HeatLoad	mVars.Days	mVars.Heat_AvgMW	mPkDayWthr.PkHDDIdx	mVars.Heat_Var
2028	1	399,551.2	24,050.0	96,953.9	520,555.1	31.0	699.7	1.2	854.9
2028	2	371,038.8	22,351.0	90,052.2	483,442.0	29.0	694.6	1.2	856.3
2028	3	352,124.3	21,227.9	85,477.8	458,829.9	31.0	616.7	1.1	680.4
2028	4	249,604.6	15,059.1	60,602.7	325,266.5	30.0	451.8	0.6	288.7
2028	5	165,477.2	9,991.3	40,184.6	215,653.0	31.0	289.9	0.4	121.3
2028	6	71,376.7	4,312.9	17,336.5	93,026.1	30.0	129.2	0.2	21.1
2028	7	11,384.9	688.5	2,765.8	14,839.1	31.0	20.0	-	-
2028	8	4,095.7	247.9	995.3	5,338.8	31.0	7.2	-	-
2028	9	40,791.0	2,471.1	9,915.4	53,177.5	30.0	73.9	-	-
2028	10	130,642.0	7,921.1	31,765.8	170,328.9	31.0	228.9	0.5	118.6
2028	11	234,728.3	14,244.5	57,091.8	306,064.6	30.0	425.1	0.8	331.8
2028	12	340,344.3	20,672.1	82,805.1	443,821.4	31.0	596.5	1.0	590.5
2029	1	405,471.6	24,822.2	98,787.7	529,081.5	31.0	711.1	1.2	866.3
2029	2	364,099.7	22,309.1	88,734.6	475,143.4	28.0	707.1	1.2	869.1
2029	3	357,326.0	21,913.4	87,109.9	466,349.3	31.0	626.8	1.1	691.6
2029	4	253,286.2	15,546.8	61,765.4	330,598.3	30.0	459.2	0.6	293.5
2029	5	167,914.1	10,315.7	40,959.1	219,188.9	31.0	294.6	0.4	123.3
2029	6	72,426.3	4,453.4	17,672.2	94,551.8	30.0	131.3	0.2	21.4
2029	7	11,552.0	711.0	2,819.6	15,082.5	31.0	20.3	-	-
2029	8	4,155.6	256.0	1,014.6	5,426.2	31.0	7.3	-	-
2029	9	41,386.1	2,551.8	10,108.6	54,046.5	30.0	75.1	-	-
2029	10	132,541.7	8,180.0	32,385.0	173,106.6	31.0	232.7	0.5	120.5
2029	11	238,130.5	14,710.3	58,205.2	311,046.0	30.0	432.0	0.8	337.2
2029	12	345,261.4	21,348.2	84,420.9	451,030.5	31.0	606.2	1.0	600.1
2030	1	411,261.4	25,445.7	102,081.4	538,788.5	31.0	724.2	1.2	879.8
2030	2	369,281.9	22,869.7	91,694.2	483,845.9	28.0	720.0	1.2	882.7
2030	3	362,395.2	22,464.3	90,016.4	474,875.8	31.0	638.3	1.1	704.2
2030	4	256,867.6	15,937.7	63,826.9	336,632.2	30.0	467.5	0.6	298.8
2030	5	170,280.5	10,575.2	42,326.7	223,182.4	31.0	300.0	0.4	125.5
2030	6	73,443.5	4,565.5	18,262.4	96,271.4	30.0	133.7	0.2	21.8
2030	7	11,713.8	728.9	2,913.8	15,356.4	31.0	20.6	-	-
2030	8	4,213.6	262.4	1,048.6	5,524.6	31.0	7.4	-	-
2030	9	41,961.9	2,616.1	10,446.4	55,024.3	30.0	76.4	-	-
2030	10	134,379.7	8,385.9	33,467.5	176,233.1	31.0	236.9	0.5	122.7
2030	11	241,422.5	15,080.7	60,151.0	316,654.3	30.0	439.8	0.8	343.2
2030	12	350,019.3	21,885.8	87,243.6	459,148.8	31.0	617.1	1.0	610.9
2031	1	416,805.7	26,223.4	105,610.1	548,639.2	31.0	737.4	1.2	893.7
2031	2	374,243.9	23,568.7	94,864.3	492,676.9	28.0	733.2	1.2	896.5
2031	3	367,248.8	23,150.9	93,128.9	483,528.6	31.0	649.9	1.1	717.1
2031	4	260,296.8	16,424.9	66,034.2	342,755.9	30.0	476.1	0.6	304.3
2031	5	172,546.4	10,898.5	43,790.7	227,235.6	31.0	305.4	0.4	127.8
2031	6	74,417.7	4,705.1	18,894.2	98,016.9	30.0	136.1	0.2	22.2
2031	7	11,868.6	751.1	3,014.6	15,634.3	31.0	21.0	-	-
2031	8	4,269.0	270.5	1,084.8	5,624.3	31.0	7.6	-	-
2031	9	42,510.1	2,696.1	10,808.1	56,014.3	30.0	77.8	-	-

Year	Month	ResEndUse.ResHeat	NResEndUse.SmlGenHeat	NResEndUse.GenHeat	mVars.HeatLoad	mVars.Days	mVars.Heat_AvgMW	mPkDayWthr.PkHDDIdx	mVars.Heat_Var
2031	10	136,125.2	8,642.7	34,626.6	179,394.5	31.0	241.1	0.5	124.9
2031	11	244,539.8	15,542.8	62,235.0	322,317.5	30.0	447.7	0.8	349.4
2031	12	354,511.9	22,556.7	90,267.2	467,335.8	31.0	628.1	1.0	621.8
2032	1	422,074.6	26,997.9	109,177.6	558,250.1	31.0	750.3	1.2	907.2
2032	2	391,881.5	25,093.5	101,417.5	518,392.5	29.0	744.8	1.2	908.7
2032	3	371,835.1	23,835.4	96,276.9	491,947.5	31.0	661.2	1.1	729.5
2032	4	263,527.6	16,910.8	68,267.1	348,705.6	30.0	484.3	0.6	309.5
2032	5	174,674.9	11,221.1	45,272.0	231,167.9	31.0	310.7	0.4	130.0
2032	6	75,330.0	4,844.4	19,533.5	99,707.9	30.0	138.5	0.2	22.6
2032	7	12,013.2	773.4	3,116.6	15,903.2	31.0	21.4	-	-
2032	8	4,320.8	278.5	1,121.6	5,720.9	31.0	7.7	-	-
2032	9	43,025.3	2,776.4	11,174.4	56,976.1	30.0	79.1	-	-
2032	10	137,770.3	8,900.7	35,801.0	182,471.9	31.0	245.3	0.5	127.0
2032	11	247,487.2	16,007.8	64,347.1	327,842.1	30.0	455.3	0.8	355.4
2032	12	358,773.4	23,233.2	93,332.7	475,339.3	31.0	638.9	1.0	632.4
2033	1	426,575.99	27,783.1	113,736.53	568,095.7	31.0	763.57	1.21	921.29
2033	2	382,975.38	24,972.73	102,167.19	510,115.29	28.0	759.1	1.22	924.22
2033	3	375,776.49	24,532.12	100,301.43	500,610.03	31.0	672.86	1.1	742.39
2033	4	266,312.32	17,406.32	71,122.25	354,840.90	30.0	492.83	0.64	314.99
2033	5	176,515.04	11,550.68	47,166.38	235,232.10	31.0	316.17	0.42	132.28
2033	6	76,121.14	4,987.02	20,351.32	101,459.49	30.0	140.92	0.16	23
2033	7	12,138.98	796.21	3,247.17	16,182.36	31.0	21.75	0	0
2033	8	4,365.95	286.72	1,168.57	5,821.24	31.0	7.82	0	0
2033	9	43,473.23	2,858.46	11,642.57	57,974.26	30.0	80.52	0	0
2033	10	139,200.76	9,163.96	37,300.97	185,665.68	31.0	249.55	0.52	129.22
2033	11	250,049.67	16,481.60	67,043.41	333,574.69	30.0	463.3	0.78	361.57
2033	12	362,477.57	23,921.36	97,243.85	483,642.79	31.0	650.06	0.99	643.44

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2013	1	-	-	-	-	31.0	-	-	-
2013	2	-	-	-	-	28.0	-	-	-
2013	3	-	-	-	-	31.0	-	-	-
2013	4	1.8	0.3	2.9	5.1	30.0	0.0	-	-
2013	5	646.4	115.1	1,061.6	1,823.2	31.0	2.5	-	-
2013	6	5,148.8	917.2	8,448.4	14,514.4	30.0	20.2	1.3	26.7
2013	7	20,795.3	3,711.2	34,100.4	58,606.9	31.0	78.8	1.5	117.9
2013	8	24,558.4	4,388.2	40,256.6	69,203.1	31.0	93.0	0.9	79.7
2013	9	10,753.2	1,920.7	17,625.4	30,299.3	30.0	42.1	0.3	10.6
2013	10	1,101.0	196.4	1,804.8	3,102.3	31.0	4.2	-	-
2013	11	84.5	15.1	138.5	238.0	30.0	0.3	-	-
2013	12	-	-	-	-	31.0	-	-	-
2014	1	-	-	-	-	31.0	-	-	-
2014	2	-	-	-	-	28.0	-	-	-
2014	3	-	-	-	-	31.0	-	-	-
2014	4	2.0	0.3	2.9	5.3	30.0	0.0	-	-
2014	5	729.7	115.4	1,061.6	1,906.7	31.0	2.6	-	-
2014	6	5,807.0	918.9	8,457.6	15,183.4	30.0	21.1	-	-
2014	7	23,444.2	3,709.9	34,178.3	61,332.4	31.0	82.4	0.2	18.8
2014	8	27,678.4	4,373.8	40,344.1	72,396.3	31.0	97.3	0.8	80.1
2014	9	12,117.1	1,919.7	17,654.4	31,691.1	30.0	44.0	0.4	15.6
2014	10	1,240.6	196.6	1,807.0	3,244.3	31.0	4.4	-	-
2014	11	95.2	15.1	138.6	248.9	30.0	0.4	-	-
2014	12	-	-	-	-	31.0	-	-	-
2015	1	-	-	-	-	31.0	-	-	-
2015	2	-	-	-	-	28.0	-	-	-
2015	3	-	-	-	-	31.0	-	-	-
2015	4	2.4	0.3	2.9	5.6	30.0	0.0	-	-
2015	5	854.5	116.9	1,061.8	2,033.2	31.0	2.7	-	-
2015	6	6,802.2	930.6	8,458.0	16,190.8	30.0	22.5	-	-
2015	7	27,477.5	3,765.3	34,162.3	65,405.2	31.0	87.9	0.6	49.2
2015	8	32,431.4	4,450.5	40,351.4	77,233.2	31.0	103.8	0.6	60.5
2015	9	14,192.9	1,953.6	17,670.8	33,817.3	30.0	47.0	0.7	34.9
2015	10	1,453.2	200.3	1,810.6	3,464.0	31.0	4.7	-	-
2015	11	111.5	15.4	139.0	265.9	30.0	0.4	-	-
2015	12	-	-	-	-	31.0	-	-	-
2016	1	-	-	-	-	31.0	-	-	-
2016	2	-	-	-	-	29.0	-	-	-
2016	3	-	-	-	-	31.0	-	-	-
2016	4	2.7	0.3	3.0	6.0	30.0	0.0	-	-
2016	5	979.7	119.6	1,069.7	2,168.9	31.0	2.9	-	-

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2016	6	7,797.9	951.5	8,527.3	17,276.7	30.0	24.0	-	-
2016	7	31,499.0	3,848.7	34,484.7	69,832.4	31.0	93.9	0.7	65.4
2016	8	37,205.5	4,549.1	40,759.6	82,514.2	31.0	110.9	0.7	79.9
2016	9	16,303.7	1,998.9	17,863.7	36,166.3	30.0	50.2	0.9	43.6
2016	10	1,671.0	205.0	1,832.0	3,708.0	31.0	5.0	-	-
2016	11	128.3	15.8	140.7	284.8	30.0	0.4	-	-
2016	12	-	-	-	-	31.0	-	-	-
2017	1	-	-	-	-	31.0	-	-	-
2017	2	-	-	-	-	28.0	-	-	-
2017	3	-	-	-	-	31.0	-	-	-
2017	4	3.1	0.3	3.0	6.4	30.0	0.0	-	-
2017	5	1,109.3	122.9	1,089.7	2,321.9	31.0	3.1	-	-
2017	6	8,835.9	981.4	8,687.9	18,505.3	30.0	25.7	1.4	35.5
2017	7	35,705.2	3,974.1	35,139.8	74,819.1	31.0	100.6	1.2	120.7
2017	8	42,181.0	4,687.6	41,512.5	88,381.1	31.0	118.8	1.0	119.5
2017	9	18,484.0	2,054.1	18,185.4	38,723.6	30.0	53.8	0.2	12.9
2017	10	1,893.2	210.4	1,863.5	3,967.0	31.0	5.3	-	-
2017	11	145.4	16.2	143.1	304.6	30.0	0.4	-	-
2017	12	-	-	-	-	31.0	-	-	-
2018	1	-	-	-	-	31.0	-	-	-
2018	2	-	-	-	-	28.0	-	-	-
2018	3	-	-	-	-	31.0	-	-	-
2018	4	3.4	0.4	3.0	6.8	30.0	0.0	-	-
2018	5	1,228.2	124.8	1,101.1	2,454.1	31.0	3.3	-	-
2018	6	9,783.9	996.6	8,779.5	19,560.0	30.0	27.2	-	-
2018	7	39,538.7	4,026.4	35,498.8	79,063.9	31.0	106.3	0.8	83.8
2018	8	46,696.6	4,762.0	41,994.7	93,453.3	31.0	125.6	1.0	129.2
2018	9	20,451.9	2,089.4	18,423.3	40,964.5	30.0	56.9	1.1	60.5
2018	10	2,095.1	214.6	1,890.2	4,199.9	31.0	5.7	-	-
2018	11	160.8	16.5	145.3	322.6	30.0	0.5	-	-
2018	12	-	-	-	-	31.0	-	-	-
2019	1	-	-	-	-	31.0	-	-	-
2019	2	-	-	-	-	28.0	-	-	-
2019	3	-	-	-	-	31.0	-	-	-
2019	4	3.7	0.4	3.1	7.2	30.0	0.0	-	-
2019	5	1,347.5	128.2	1,127.8	2,603.4	31.0	3.5	-	-
2019	6	10,733.9	1,023.0	9,003.8	20,760.7	30.0	28.8	-	-
2019	7	43,351.0	4,145.5	36,453.7	83,950.3	31.0	112.8	1.0	113.5
2019	8	51,203.5	4,876.9	42,884.6	98,965.0	31.0	133.0	1.2	159.6
2019	9	22,412.8	2,124.6	18,705.8	43,243.2	30.0	60.1	0.5	26.8
2019	10	2,294.4	217.0	1,908.6	4,420.0	31.0	5.9	-	-

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2019	11	176.1	16.6	145.9	338.5	30.0	0.5	-	-
2019	12	-	-	-	-	31.0	-	-	-
2020	1	-	-	-	-	31.0	-	-	-
2020	2	-	-	-	-	29.0	-	-	-
2020	3	-	-	-	-	31.0	-	-	-
2020	4	3.9	0.4	3.0	7.3	30.0	0.0	-	-
2020	5	1,419.9	124.7	1,093.9	2,638.6	31.0	3.6	-	-
2020	6	11,310.3	990.2	8,675.3	20,975.9	30.0	29.1	0.8	22.0
2020	7	45,695.5	3,986.2	34,890.0	84,571.8	31.0	113.7	1.3	148.1
2020	8	54,004.8	4,726.0	41,361.1	100,091.9	31.0	134.5	1.0	139.9
2020	9	23,661.7	2,080.7	18,181.2	43,923.6	30.0	61.0	-	-
2020	10	2,424.0	213.8	1,869.3	4,507.1	31.0	6.1	-	-
2020	11	186.3	16.5	144.1	346.8	30.0	0.5	-	-
2020	12	-	-	-	-	31.0	-	-	-
2021	1	-	-	-	-	31.0	-	-	-
2021	2	-	-	-	-	28.0	-	-	-
2021	3	-	-	-	-	31.0	-	-	-
2021	4	4.2	0.4	3.1	7.7	30.0	0.0	-	-
2021	5	1,518.9	130.4	1,132.5	2,781.8	31.0	3.7	-	-
2021	6	12,110.7	1,044.2	9,063.8	22,218.6	30.0	30.9	1.4	43.7
2021	7	48,974.4	4,244.7	36,800.3	90,019.4	31.0	121.0	0.5	59.5
2021	8	57,833.4	5,019.4	43,502.2	106,355.1	31.0	143.0	1.2	171.5
2021	9	25,361.4	2,202.5	19,067.4	46,631.3	30.0	64.8	0.4	27.4
2021	10	2,597.4	226.1	1,955.4	4,778.9	31.0	6.4	-	-
2021	11	199.5	17.4	150.2	367.1	30.0	0.5	-	-
2021	12	-	-	-	-	31.0	-	-	-
2022	1	-	-	-	-	31.0	-	-	-
2022	2	-	-	-	-	28.0	-	-	-
2022	3	-	-	-	-	31.0	-	-	-
2022	4	4.5	0.4	3.2	8.1	30.0	0.0	-	-
2022	5	1,634.8	135.8	1,162.2	2,932.7	31.0	3.9	-	-
2022	6	13,035.2	1,084.6	9,273.2	23,393.1	30.0	32.5	0.3	10.0
2022	7	52,779.8	4,399.7	37,534.4	94,713.9	31.0	127.3	0.7	87.3
2022	8	62,370.8	5,203.1	44,346.5	111,920.4	31.0	150.4	1.1	165.0
2022	9	27,330.3	2,283.2	19,423.6	49,037.1	30.0	68.1	1.0	70.1
2022	10	2,798.5	233.8	1,990.6	5,022.9	31.0	6.8	-	-
2022	11	214.8	18.0	152.7	385.5	30.0	0.5	-	-
2022	12	-	-	-	-	31.0	-	-	-
2023	1	-	-	-	-	31.0	-	-	-
2023	2	-	-	-	-	28.0	-	-	-
2023	3	-	-	-	-	31.0	-	-	-

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2023	4	4.8	0.4	3.2	8.4	30.0	0.0	-	-
2023	5	1,732.1	138.6	1,170.5	3,041.2	31.0	4.1	-	-
2023	6	13,781.1	1,104.9	9,320.7	24,206.7	30.0	33.6	0.2	6.8
2023	7	55,597.1	4,466.6	37,644.3	97,708.0	31.0	131.3	1.1	149.3
2023	8	65,574.2	5,278.5	44,465.5	115,318.2	31.0	155.0	0.8	127.0
2023	9	28,682.6	2,313.0	19,475.2	50,470.7	30.0	70.1	0.7	45.3
2023	10	2,934.5	237.1	1,995.3	5,166.9	31.0	6.9	-	-
2023	11	224.9	18.2	153.2	396.3	30.0	0.6	-	-
2023	12	-	-	-	-	31.0	-	-	-
2024	1	-	-	-	-	31.0	-	-	-
2024	2	-	-	-	-	29.0	-	-	-
2024	3	-	-	-	-	31.0	-	-	-
2024	4	5.1	0.4	3.3	8.8	30.0	0.0	-	-
2024	5	1,835.6	142.3	1,194.5	3,172.4	31.0	4.3	-	-
2024	6	14,607.1	1,134.8	9,518.7	25,260.6	30.0	35.1	0.2	7.1
2024	7	58,955.8	4,588.8	38,473.0	102,017.6	31.0	137.1	1.1	155.9
2024	8	69,525.0	5,420.9	45,435.0	120,380.9	31.0	161.8	0.8	132.6
2024	9	30,401.4	2,374.6	19,895.9	52,671.9	30.0	73.2	0.7	47.3
2024	10	3,109.7	243.3	2,038.1	5,391.1	31.0	7.3	-	-
2024	11	238.3	18.7	156.4	413.4	30.0	0.6	-	-
2024	12	-	-	-	-	31.0	-	-	-
2025	1	-	-	-	-	31.0	-	-	-
2025	2	-	-	-	-	28.0	-	-	-
2025	3	-	-	-	-	31.0	-	-	-
2025	4	5.4	0.4	3.4	9.2	30.0	0.0	-	-
2025	5	1,940.7	146.0	1,221.8	3,308.5	31.0	4.5	-	-
2025	6	15,451.4	1,164.7	9,741.0	26,357.2	30.0	36.6	0.2	7.4
2025	7	62,396.3	4,711.5	39,391.6	106,499.3	31.0	143.1	1.1	162.8
2025	8	73,619.3	5,567.5	46,529.6	125,716.4	31.0	169.0	0.8	138.5
2025	9	32,208.0	2,439.6	20,379.5	55,027.0	30.0	76.4	0.7	49.4
2025	10	3,296.2	250.1	2,088.0	5,634.2	31.0	7.6	-	-
2025	11	252.7	19.2	160.3	432.2	30.0	0.6	-	-
2025	12	-	-	-	-	31.0	-	-	-
2026	1	-	-	-	-	31.0	-	-	-
2026	2	-	-	-	-	28.0	-	-	-
2026	3	-	-	-	-	31.0	-	-	-
2026	4	5.7	0.4	3.5	9.6	30.0	0.0	-	-
2026	5	2,052.0	150.4	1,250.6	3,453.1	31.0	4.6	-	-
2026	6	16,337.0	1,199.1	9,968.1	27,504.1	30.0	38.2	0.2	7.7
2026	7	65,968.8	4,849.4	40,296.3	111,114.5	31.0	149.4	1.1	169.8
2026	8	77,833.7	5,730.1	47,594.1	131,157.9	31.0	176.3	0.8	144.5

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2026	9	34,051.4	2,510.6	20,843.8	57,405.8	30.0	79.7	0.7	51.6
2026	10	3,484.8	257.3	2,135.4	5,877.5	31.0	7.9	-	-
2026	11	267.2	19.8	163.9	450.9	30.0	0.6	-	-
2026	12	-	-	-	-	31.0	-	-	-
2027	1	-	-	-	-	31.0	-	-	-
2027	2	-	-	-	-	28.0	-	-	-
2027	3	-	-	-	-	31.0	-	-	-
2027	4	6.0	0.4	3.5	10.0	30.0	0.0	-	-
2027	5	2,162.4	154.6	1,278.0	3,594.9	31.0	4.8	-	-
2027	6	17,215.2	1,232.5	10,185.0	28,632.8	30.0	39.8	0.2	8.0
2027	7	69,514.4	4,984.4	41,169.8	115,668.6	31.0	155.5	1.1	176.8
2027	8	82,011.6	5,889.5	48,617.7	136,518.7	31.0	183.5	0.8	150.4
2027	9	35,876.8	2,580.4	21,288.6	59,745.8	30.0	83.0	0.7	53.7
2027	10	3,671.3	264.5	2,180.6	6,116.4	31.0	8.2	-	-
2027	11	281.5	20.3	167.3	469.1	30.0	0.7	-	-
2027	12	-	-	-	-	31.0	-	-	-
2028	1	-	-	-	-	31.0	-	-	-
2028	2	-	-	-	-	29.0	-	-	-
2028	3	-	-	-	-	31.0	-	-	-
2028	4	6.3	0.4	3.6	10.3	30.0	0.0	-	-
2028	5	2,268.7	158.4	1,303.3	3,730.4	31.0	5.0	-	-
2028	6	18,060.7	1,262.5	10,385.3	29,708.5	30.0	41.3	0.2	8.4
2028	7	72,923.8	5,105.5	41,972.6	120,001.8	31.0	161.3	1.1	183.4
2028	8	86,037.3	6,033.1	49,570.1	141,640.5	31.0	190.4	0.8	156.0
2028	9	37,639.3	2,643.5	21,707.6	61,990.5	30.0	86.1	0.7	55.7
2028	10	3,851.9	271.0	2,223.7	6,346.5	31.0	8.5	-	-
2028	11	295.3	20.8	170.7	486.8	30.0	0.7	-	-
2028	12	-	-	-	-	31.0	-	-	-
2029	1	-	-	-	-	31.0	-	-	-
2029	2	-	-	-	-	28.0	-	-	-
2029	3	-	-	-	-	31.0	-	-	-
2029	4	6.6	0.5	3.7	10.7	30.0	0.0	-	-
2029	5	2,373.2	162.7	1,329.7	3,865.5	31.0	5.2	-	-
2029	6	18,892.9	1,297.2	10,596.2	30,786.3	30.0	42.8	0.2	8.7
2029	7	76,287.0	5,246.1	42,828.8	124,361.9	31.0	167.2	1.1	190.1
2029	8	90,006.5	6,199.4	50,581.9	146,787.8	31.0	197.3	0.8	161.7
2029	9	39,376.3	2,716.4	22,151.0	64,243.7	30.0	89.2	0.7	57.7
2029	10	4,029.7	278.4	2,269.2	6,577.3	31.0	8.8	-	-
2029	11	309.0	21.4	174.2	504.5	30.0	0.7	-	-
2029	12	-	-	-	-	31.0	-	-	-
2030	1	-	-	-	-	31.0	-	-	-

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2030	2	-	-	-	-	28.0	-	-	-
2030	3	-	-	-	-	31.0	-	-	-
2030	4	6.9	0.5	3.8	11.1	30.0	0.0	-	-
2030	5	2,474.6	167.1	1,355.9	3,997.7	31.0	5.4	-	-
2030	6	19,701.2	1,332.4	10,805.5	31,839.0	30.0	44.2	0.2	9.0
2030	7	79,551.7	5,388.4	43,675.3	128,615.5	31.0	172.9	1.1	196.6
2030	8	93,859.6	6,367.6	51,582.0	151,809.1	31.0	204.0	0.8	167.2
2030	9	41,062.5	2,790.1	22,589.0	66,441.6	30.0	92.3	0.7	59.7
2030	10	4,202.3	286.0	2,314.0	6,802.3	31.0	9.1	-	-
2030	11	322.2	22.0	177.6	521.8	30.0	0.7	-	-
2030	12	-	-	-	-	31.0	-	-	-
2031	1	-	-	-	-	31.0	-	-	-
2031	2	-	-	-	-	28.0	-	-	-
2031	3	-	-	-	-	31.0	-	-	-
2031	4	7.1	0.5	3.8	11.4	30.0	0.0	-	-
2031	5	2,575.0	171.5	1,382.5	4,129.1	31.0	5.6	-	-
2031	6	20,500.4	1,367.9	11,017.6	32,885.9	30.0	45.7	0.2	9.2
2031	7	82,780.2	5,532.0	44,532.9	132,845.0	31.0	178.6	1.1	203.0
2031	8	97,670.9	6,537.3	52,595.4	156,803.6	31.0	210.8	0.8	172.7
2031	9	42,730.9	2,864.6	23,033.1	68,628.5	30.0	95.3	0.7	61.7
2031	10	4,373.1	293.6	2,359.6	7,026.3	31.0	9.4	-	-
2031	11	335.3	22.6	181.1	539.0	30.0	0.8	-	-
2031	12	-	-	-	-	31.0	-	-	-
2032	1	-	-	-	-	31.0	-	-	-
2032	2	-	-	-	-	29.0	-	-	-
2032	3	-	-	-	-	31.0	-	-	-
2032	4	7.4	0.5	3.9	11.8	30.0	0.0	-	-
2032	5	2,673.0	176.5	1,409.6	4,259.1	31.0	5.7	-	-
2032	6	21,281.3	1,407.4	11,233.5	33,922.2	30.0	47.1	0.2	9.5
2032	7	85,935.1	5,692.1	45,406.1	137,033.2	31.0	184.2	1.1	209.4
2032	8	101,394.4	6,726.9	53,627.8	161,749.1	31.0	217.4	0.8	178.2
2032	9	44,360.4	2,947.8	23,485.7	70,794.0	30.0	98.3	0.7	63.6
2032	10	4,540.0	302.2	2,406.0	7,248.1	31.0	9.7	-	-
2032	11	348.1	23.2	184.7	556.0	30.0	0.8	-	-
2032	12	-	-	-	-	31.0	-	-	-
2033	1	-	-	-	-	31.0	-	-	-
2033	2	-	-	-	-	28.0	-	-	-
2033	3	-	-	-	-	31.0	-	-	-
2033	4	7.7	0.5	4.0	12.2	30.0	0.0	-	-
2033	5	2,767.9	181.2	1,437.3	4,386.3	31.0	5.9	-	-
2033	6	22,036.6	1,444.9	11,454.1	34,935.6	30.0	48.5	0.2	9.8

Year	Month	ResEndUse.ResCool	NResEndUse.SmlGenCool	NResEndUse.GenCool	mVars.CoolLoad	mVars.Days	mVars.Cool_AvgMW	mPkDayWthr.PkCDDIdx	mVars.Cool_Var
2033	7	88,986.0	5,844.0	46,298.8	141,128.8	31.0	189.7	1.1	215.7
2033	8	104,995.3	6,906.7	54,682.3	166,584.3	31.0	223.9	0.8	183.5
2033	9	45,936.3	3,026.7	23,947.6	72,910.5	30.0	101.3	0.7	65.5
2033	10	4,701.3	310.3	2,453.3	7,464.8	31.0	10.0	-	-
2033	11	360.5	23.8	188.3	572.6	30.0	0.8	-	-
2033	12	-	-	-	-	31.0	-	-	-

Year	Month	ResEndUse.ResOther	NResEndUse.SmlGenOther	NResEndUse.GenOther	Sales.SmlInd	Sales.MedInd	Sales.Unm	mVars.OthrUse	mVars.Days	mVars.Other_AvgMW
2013	1	246,919.1	14,475.3	156,645.9	25,704.8	42,300.1	8,822.5	494,867.7	31.0	665.1
2013	2	192,157.9	13,065.5	141,431.5	22,241.3	41,453.1	8,666.2	419,015.4	28.0	623.5
2013	3	218,036.7	16,664.2	156,556.6	22,892.5	39,360.3	8,710.2	462,220.4	31.0	621.3
2013	4	192,816.5	13,991.4	151,436.2	20,623.8	40,550.3	8,748.6	428,166.8	30.0	594.7
2013	5	195,718.2	14,453.3	156,456.2	21,181.5	39,671.7	8,719.1	436,199.9	31.0	586.3
2013	6	190,868.8	13,995.4	151,353.4	19,725.8	40,788.5	8,823.6	425,555.6	30.0	591.1
2013	7	187,255.7	14,492.0	156,336.9	22,439.7	41,390.5	8,900.2	430,815.0	31.0	579.1
2013	8	221,766.8	14,523.7	156,429.1	20,194.8	41,851.3	8,905.7	463,671.4	31.0	623.2
2013	9	225,204.2	15,429.7	151,502.2	20,524.0	41,219.1	8,906.1	462,785.3	30.0	642.8
2013	10	222,349.2	14,522.3	156,648.4	16,917.9	39,569.2	8,792.9	458,799.9	31.0	616.7
2013	11	197,647.4	14,051.9	151,691.1	19,581.4	39,953.2	8,718.2	431,643.1	30.0	599.5
2013	12	213,008.3	11,863.6	156,836.4	19,616.6	40,039.3	8,828.6	450,192.9	31.0	605.1
2014	1	241,562.8	15,052.1	154,423.6	25,498.7	40,921.6	8,806.5	486,265.3	31.0	653.6
2014	2	194,942.0	12,828.3	144,025.6	22,031.3	40,095.7	8,654.6	422,577.4	28.0	628.8
2014	3	215,345.8	15,993.9	150,544.7	22,678.5	38,024.0	8,700.3	451,287.1	31.0	606.6
2014	4	191,541.1	12,913.8	146,877.7	20,405.9	39,235.1	8,740.4	419,714.0	30.0	582.9
2014	5	191,608.8	14,425.4	151,787.5	20,959.6	38,377.6	8,712.6	425,871.4	31.0	572.4
2014	6	189,518.4	13,154.4	150,184.3	19,499.9	39,515.6	8,817.2	420,689.7	30.0	584.3
2014	7	186,851.1	13,581.5	151,611.9	22,209.9	40,138.6	8,893.2	423,286.2	31.0	568.9
2014	8	217,537.0	13,920.6	157,485.1	19,992.3	40,624.5	8,897.0	458,456.5	31.0	616.2
2014	9	224,224.1	15,327.0	152,981.3	20,348.7	40,017.3	8,900.1	461,798.5	30.0	641.4
2014	10	216,733.0	14,341.5	157,489.6	16,770.0	38,392.5	8,790.1	452,516.7	31.0	608.2
2014	11	194,994.5	13,199.9	149,321.2	19,460.8	38,801.5	8,717.0	424,494.9	30.0	589.6
2014	12	212,557.1	11,845.6	152,130.6	19,523.3	38,912.8	8,826.3	443,795.6	31.0	596.5
2015	1	239,887.3	14,766.1	154,421.6	25,432.6	39,820.1	8,802.5	483,130.2	31.0	649.4
2015	2	188,299.3	13,284.9	138,473.0	21,992.5	39,019.3	8,652.8	409,721.7	28.0	609.7
2015	3	200,153.1	16,899.7	150,126.9	22,667.0	36,972.6	8,696.8	435,516.1	31.0	585.4
2015	4	222,186.2	13,422.2	146,288.3	20,421.7	38,208.8	10,929.1	451,456.2	30.0	627.0
2015	5	237,947.2	14,905.1	150,176.9	21,002.7	37,376.3	8,709.6	470,117.7	31.0	631.9
2015	6	186,423.5	13,778.5	146,783.3	19,570.3	38,539.3	8,813.0	413,908.0	30.0	574.9
2015	7	184,681.9	15,476.4	155,622.3	22,307.6	39,187.4	8,887.4	426,162.9	31.0	572.8
2015	8	214,270.8	14,958.4	154,955.2	20,085.3	39,787.8	8,893.1	452,950.6	31.0	608.8
2015	9	222,064.0	15,904.2	146,347.3	20,437.0	39,295.1	8,896.2	452,943.8	30.0	629.1
2015	10	217,858.7	14,117.4	154,701.4	16,853.6	37,784.8	8,787.8	450,103.7	31.0	605.0
2015	11	196,318.9	14,435.1	149,104.3	19,539.7	38,308.3	6,911.5	424,617.7	30.0	589.8
2015	12	206,907.1	12,157.4	152,069.7	19,597.5	38,534.0	8,824.5	438,090.2	31.0	588.8
2016	1	237,864.1	15,570.7	152,785.8	25,502.2	37,471.7	8,806.2	478,000.6	31.0	642.5
2016	2	188,703.2	13,282.8	140,028.9	22,057.3	36,785.3	8,649.9	409,507.4	29.0	588.4
2016	3	204,420.0	16,380.2	152,948.4	22,727.2	34,853.1	8,695.0	440,023.9	31.0	591.4
2016	4	181,841.8	15,532.5	150,284.0	20,477.1	36,203.8	8,735.6	413,074.7	30.0	573.7
2016	5	196,690.5	16,069.1	149,019.6	21,053.4	35,485.8	8,707.8	427,026.2	31.0	574.0
2016	6	190,992.3	14,329.6	144,866.5	19,616.4	36,763.3	8,814.4	415,382.5	30.0	576.9
2016	7	181,515.2	14,951.2	152,894.4	22,349.0	37,525.9	8,891.5	418,127.1	31.0	562.0

Year	Month	ResEndUse.ResOther	NResEndUse.SmlGenOther	NResEndUse.GenOther	Sales.SmlInd	Sales.MedInd	Sales.Unm	mVars.OthrUse	mVars.Days	mVars.Other_AvgMW
2016	8	210,389.6	14,951.9	150,753.3	20,128.4	38,165.2	6,960.4	441,348.8	31.0	593.2
2016	9	216,202.7	15,408.7	147,129.4	20,481.8	37,711.5	6,961.8	443,895.9	30.0	616.5
2016	10	216,613.2	15,725.5	154,657.4	16,900.1	36,240.3	6,850.1	446,986.5	31.0	600.8
2016	11	197,729.3	13,736.7	145,673.7	19,587.9	36,802.7	6,775.3	420,305.6	30.0	583.8
2016	12	201,570.4	12,593.7	152,394.3	19,647.4	37,067.4	6,889.4	430,162.7	31.0	578.2
2017	1	231,974.7	15,053.6	149,634.1	25,553.8	38,128.2	6,865.1	467,209.5	31.0	628.0
2017	2	180,103.8	13,092.5	134,597.4	22,110.6	37,480.9	6,713.7	394,098.9	28.0	586.5
2017	3	201,619.2	17,275.8	148,196.5	22,782.2	35,587.7	6,755.4	432,216.8	31.0	580.9
2017	4	187,881.3	13,452.3	148,140.3	20,533.9	36,977.4	6,798.7	413,783.8	30.0	574.7
2017	5	188,649.5	15,792.0	151,574.4	21,111.9	36,298.4	6,768.6	420,194.7	31.0	564.8
2017	6	187,443.7	14,621.8	148,161.8	19,676.5	37,614.9	6,874.2	414,392.9	30.0	575.6
2017	7	184,477.9	15,276.5	150,582.2	22,410.8	38,416.5	6,948.5	418,112.5	31.0	562.0
2017	8	214,534.8	15,224.1	149,967.7	20,200.7	39,083.1	6,956.3	445,966.8	31.0	599.4
2017	9	214,199.8	16,862.6	150,848.1	20,564.6	38,656.7	6,953.4	448,085.1	30.0	622.3
2017	10	215,078.1	15,628.1	155,284.4	16,993.3	37,212.6	6,831.3	447,027.9	31.0	600.8
2017	11	196,553.9	14,632.8	144,093.6	19,691.6	37,802.3	6,752.3	419,526.5	30.0	582.7
2017	12	202,442.1	12,866.0	150,282.1	19,761.6	38,094.3	6,862.0	430,308.1	31.0	578.4
2018	1	224,265.2	15,787.0	150,663.1	25,678.4	39,182.4	6,833.4	462,409.5	31.0	621.5
2018	2	216,561.5	14,043.6	163,248.0	22,245.7	38,562.3	6,678.7	461,339.7	28.0	686.5
2018	3	203,059.4	17,915.5	150,131.0	22,927.7	36,696.3	6,719.4	437,449.3	31.0	588.0
2018	4	192,156.9	14,154.0	144,750.9	20,689.9	38,113.3	6,762.1	416,626.9	30.0	578.7
2018	5	194,817.4	16,122.3	146,965.4	21,278.3	37,461.5	6,729.9	423,374.9	31.0	569.1
2018	6	188,692.7	14,569.4	146,946.3	19,853.4	38,805.3	6,833.3	415,700.4	30.0	577.4
2018	7	179,989.8	16,018.1	152,512.2	22,598.2	39,634.1	6,908.7	417,661.2	31.0	561.4
2018	8	212,301.2	15,577.0	152,398.5	20,400.9	40,283.5	6,901.0	447,862.0	31.0	602.0
2018	9	216,277.4	16,255.2	149,694.5	20,777.6	39,839.8	6,900.1	449,744.6	30.0	624.7
2018	10	214,058.4	15,602.7	153,664.9	17,219.2	38,378.5	6,789.4	445,713.1	31.0	599.1
2018	11	189,315.6	14,755.3	147,935.5	19,930.3	38,951.0	6,714.5	417,602.2	30.0	580.0
2018	12	205,739.9	11,943.5	149,345.8	20,013.1	39,225.7	6,823.1	433,091.1	31.0	582.1
2019	1	232,847.5	16,181.8	148,994.0	25,942.8	40,296.5	6,801.4	471,064.0	31.0	633.2
2019	2	188,095.9	14,499.9	135,139.4	22,523.0	39,659.2	6,649.3	406,566.7	28.0	605.0
2019	3	201,371.2	18,112.5	148,653.1	23,217.8	37,776.0	6,693.7	435,824.3	31.0	585.8
2019	4	196,931.9	14,620.4	148,576.6	20,992.8	39,175.6	6,730.4	427,027.6	30.0	593.1
2019	5	183,998.2	15,739.0	151,348.8	21,594.1	38,506.7	6,693.8	417,880.6	31.0	561.7
2019	6	188,285.5	14,946.1	147,297.2	20,182.1	39,833.2	6,786.8	417,330.8	30.0	579.6
2019	7	189,467.6	15,191.5	150,763.5	22,939.6	40,644.8	6,850.8	425,857.7	31.0	572.4
2019	8	205,941.2	15,710.7	150,596.5	20,689.6	41,178.9	6,863.4	440,980.2	31.0	592.7
2019	9	215,752.0	16,604.5	145,742.4	21,013.6	40,619.9	6,861.8	446,594.2	30.0	620.3
2019	10	215,178.7	15,936.6	152,490.5	17,402.4	39,043.4	6,750.3	446,801.9	31.0	600.5
2019	11	182,376.7	14,638.6	143,152.8	20,060.8	39,500.6	6,673.7	406,403.2	30.0	564.5
2019	12	198,342.8	13,004.9	149,936.7	20,090.8	39,660.1	6,777.2	427,812.4	31.0	575.0
2020	1	233,455.9	15,889.1	148,464.1	25,967.7	40,615.7	6,745.0	471,137.4	31.0	633.3
2020	2	186,718.5	13,729.0	136,481.0	22,495.1	39,863.1	6,582.5	405,869.1	29.0	583.2

Year	Month	ResEndUse.ResOther	NResEndUse.SmlGenOther	NResEndUse.GenOther	Sales.SmlInd	Sales.MedInd	Sales.Unm	mVars.OthrUse	mVars.Days	mVars.Other_AvgMW
2020	3	208,761.4	17,678.4	143,673.1	23,137.2	37,864.7	6,621.2	437,735.9	31.0	588.4
2020	4	181,881.3	13,214.3	129,742.5	20,859.4	39,149.1	6,662.6	391,509.1	30.0	543.8
2020	5	206,178.1	12,067.3	109,299.8	21,407.9	38,364.9	6,633.4	393,951.4	31.0	529.5
2020	6	173,777.7	10,824.0	111,045.7	19,943.1	39,576.2	6,739.2	361,905.9	30.0	502.7
2020	7	217,639.5	14,950.8	135,122.6	22,648.0	40,272.5	6,811.6	437,445.0	31.0	588.0
2020	8	246,605.6	14,576.3	136,486.2	20,459.7	40,835.4	6,797.3	465,760.5	31.0	626.0
2020	9	241,723.0	16,271.1	137,532.6	20,845.4	40,305.2	6,796.3	463,473.5	30.0	643.7
2020	10	215,651.9	14,844.0	136,633.6	17,296.0	38,757.5	6,683.8	429,866.7	31.0	577.8
2020	11	202,833.3	13,830.8	136,252.2	20,016.1	39,243.4	6,607.7	418,783.5	30.0	581.6
2020	12	218,223.6	11,666.8	136,437.8	20,107.8	39,431.7	6,710.6	432,578.2	31.0	581.4
2021	1	244,559.4	15,141.7	141,863.9	26,046.5	40,416.0	6,677.8	474,705.3	31.0	638.0
2021	2	191,387.9	13,282.8	128,523.6	22,635.6	39,692.2	6,537.7	402,059.8	28.0	598.3
2021	3	210,291.8	17,125.0	140,717.8	23,339.5	37,722.5	6,581.9	435,778.5	31.0	585.7
2021	4	208,971.9	15,035.6	145,133.0	21,123.4	39,035.7	6,622.8	435,922.4	30.0	605.5
2021	5	218,783.5	15,391.4	141,317.2	21,733.7	38,280.2	6,593.0	442,099.2	31.0	594.2
2021	6	196,521.1	14,122.9	135,711.3	20,330.7	39,520.2	6,699.4	412,905.6	30.0	573.5
2021	7	200,735.7	15,398.2	143,005.9	23,097.2	40,245.3	6,772.5	429,254.7	31.0	577.0
2021	8	231,707.6	15,666.7	145,641.4	20,864.3	40,879.2	6,772.6	461,531.8	31.0	620.3
2021	9	233,660.2	16,176.1	139,089.7	21,205.3	40,420.0	6,765.2	457,316.4	30.0	635.2
2021	10	229,283.4	15,800.8	150,677.7	17,611.2	38,943.2	6,655.0	458,971.2	31.0	616.9
2021	11	208,600.4	14,930.7	142,311.3	20,286.6	39,500.1	6,580.7	432,209.6	30.0	600.3
2021	12	217,001.3	12,849.2	145,761.5	20,333.7	39,759.3	6,689.2	442,394.1	31.0	594.6
2022	1	245,059.5	15,677.9	143,406.0	26,227.6	40,814.5	6,666.3	477,851.8	31.0	642.3
2022	2	198,096.1	12,822.6	126,238.3	22,772.1	40,161.7	6,515.8	406,606.6	28.0	605.1
2022	3	252,147.3	18,165.9	146,419.0	23,431.2	38,262.9	6,560.2	484,986.6	31.0	651.9
2022	4	209,723.4	14,424.6	139,175.5	21,170.5	39,647.1	6,600.0	430,741.1	30.0	598.3
2022	5	221,347.2	16,348.0	141,990.7	21,736.1	38,962.6	6,572.0	446,956.5	31.0	600.8
2022	6	197,257.1	14,138.2	137,243.7	20,288.3	40,273.6	6,676.9	415,877.8	30.0	577.6
2022	7	202,943.7	16,470.3	147,451.4	23,010.2	41,069.6	6,752.8	437,698.1	31.0	588.3
2022	8	221,708.5	15,783.5	146,068.2	20,768.9	41,599.5	6,763.5	452,692.1	31.0	608.5
2022	9	223,542.2	17,979.2	126,051.7	21,101.7	41,036.2	6,766.0	436,477.0	30.0	606.2
2022	10	283,948.5	21,963.3	172,454.8	22,310.0	39,455.4	6,655.3	546,787.2	31.0	734.9
2022	11	199,629.6	15,422.1	140,711.1	20,166.3	39,908.3	6,581.7	422,419.2	30.0	586.7
2022	12	212,852.3	12,998.5	144,296.5	20,205.2	40,063.6	6,691.4	437,107.4	31.0	587.5
2023	1	248,932.5	16,292.2	146,008.2	26,090.8	41,014.8	6,670.3	485,008.8	31.0	651.9
2023	2	191,449.1	14,343.2	133,461.6	22,627.0	40,257.9	6,514.8	408,653.6	28.0	608.1
2023	3	211,481.1	19,525.5	150,592.1	23,277.8	38,255.2	6,557.9	449,689.7	31.0	604.4
2023	4	199,661.8	15,116.3	143,806.5	21,008.8	39,535.3	6,598.8	425,727.4	30.0	591.3
2023	5	205,457.9	16,699.0	144,984.2	21,566.1	38,746.9	6,568.0	434,022.0	31.0	583.4
2023	6	198,196.3	15,921.4	144,485.2	20,110.0	39,953.8	6,671.1	425,337.8	30.0	590.8
2023	7	198,653.3	16,793.8	147,737.5	22,823.6	40,645.9	6,745.2	433,399.3	31.0	582.5
2023	8	222,995.6	16,494.6	141,596.6	20,615.5	41,215.7	6,748.3	449,666.4	31.0	604.4
2023	9	229,294.5	15,797.8	142,605.4	20,981.4	40,692.5	6,748.4	456,119.9	30.0	633.5

Year	Month	ResEndUse.ResOther	NResEndUse.SmlGenOther	NResEndUse.GenOther	Sales.SmlInd	Sales.MedInd	Sales.Unm	mVars.OthrUse	mVars.Days	mVars.Other_AvgMW
2023	10	223,718.0	15,859.6	147,564.4	17,412.1	39,151.6	6,636.4	450,342.1	31.0	605.3
2023	11	199,980.1	15,608.5	141,107.0	20,112.3	39,644.5	6,561.4	423,013.8	30.0	587.5
2023	12	214,543.5	13,285.9	145,772.9	20,184.3	39,839.7	6,670.4	440,296.7	31.0	591.8
2024	1	249,796.5	15,664.3	145,591.6	26,103.1	40,831.0	6,647.4	484,633.9	31.0	651.4
2024	2	198,498.8	14,676.2	136,273.3	22,672.4	40,114.1	6,492.0	418,726.7	29.0	601.6
2024	3	211,196.1	18,185.4	145,897.5	23,356.4	38,151.3	6,535.1	443,321.8	31.0	595.9
2024	4	199,318.2	15,228.5	141,300.1	21,120.5	39,471.4	6,576.0	423,014.7	30.0	587.5
2024	5	205,292.6	15,759.7	146,193.8	21,710.9	38,722.9	6,545.2	434,225.1	31.0	583.6
2024	6	198,300.1	15,273.9	141,581.8	20,288.0	39,969.9	6,648.4	422,061.9	30.0	586.2
2024	7	198,768.2	15,806.0	146,479.7	23,034.8	40,701.9	6,722.5	431,513.0	31.0	580.0
2024	8	223,189.5	15,826.1	146,620.0	20,830.3	41,260.6	6,726.5	454,452.9	31.0	610.8
2024	9	229,359.6	16,863.5	141,991.6	21,199.9	40,726.2	6,727.5	456,868.3	30.0	634.5
2024	10	223,350.6	15,866.3	146,903.0	17,634.3	39,174.3	6,616.5	449,545.0	31.0	604.2
2024	11	199,404.0	15,373.9	142,261.5	20,338.3	39,656.0	6,542.4	423,576.1	30.0	588.3
2024	12	214,223.4	12,906.4	147,177.0	20,413.9	39,840.1	6,652.3	441,213.0	31.0	593.0
2025	1	249,856.9	15,686.1	145,099.7	26,336.4	40,820.2	6,630.3	484,429.6	31.0	651.1
2025	2	190,899.3	14,194.2	131,150.8	22,909.4	40,092.1	6,475.7	405,721.6	28.0	603.8
2025	3	211,076.3	18,241.5	145,538.2	23,597.2	38,118.2	6,519.8	443,091.3	31.0	595.6
2025	4	199,250.5	15,263.8	141,020.1	21,365.0	39,427.2	6,561.6	422,888.1	30.0	587.3
2025	5	205,453.3	15,801.3	145,975.0	21,959.1	38,667.6	6,531.7	434,388.0	31.0	583.9
2025	6	198,852.1	15,319.4	141,441.7	20,539.9	39,903.4	6,635.8	422,692.4	30.0	587.1
2025	7	199,825.5	15,858.8	146,409.9	23,290.3	40,624.3	6,710.8	432,719.7	31.0	581.6
2025	8	224,625.1	15,883.9	146,581.2	21,082.2	41,183.5	6,715.2	456,071.1	31.0	613.0
2025	9	230,514.5	16,939.6	141,983.6	21,448.0	40,649.7	6,716.5	458,251.9	30.0	636.5
2025	10	224,043.0	15,934.2	146,923.9	17,878.7	39,098.2	6,605.8	450,483.9	31.0	605.5
2025	11	199,881.8	15,444.6	142,315.1	20,578.9	39,580.5	6,532.1	424,333.1	30.0	589.4
2025	12	214,992.1	12,954.6	147,266.4	20,650.9	39,765.1	6,642.3	442,271.3	31.0	594.5
2026	1	253,459.1	15,774.6	145,213.3	26,569.6	40,745.8	6,620.6	488,382.9	31.0	656.4
2026	2	193,684.7	14,270.5	131,207.6	23,138.9	40,018.3	6,466.4	408,786.4	28.0	608.3
2026	3	214,071.5	18,347.2	145,550.6	23,822.9	38,044.9	6,510.8	446,347.8	31.0	599.9
2026	4	201,955.2	15,338.1	140,983.5	21,587.0	39,354.4	6,552.9	425,771.1	30.0	591.4
2026	5	208,185.0	15,874.4	145,887.8	22,177.4	38,595.3	6,523.3	437,243.2	31.0	587.7
2026	6	201,587.1	15,386.5	141,309.9	20,754.4	39,831.7	6,627.8	425,497.4	30.0	591.0
2026	7	202,980.9	15,924.4	146,225.0	23,501.1	40,553.1	6,703.1	435,887.7	31.0	585.9
2026	8	228,107.7	15,948.5	146,383.0	21,292.5	41,109.8	6,707.6	459,549.1	31.0	617.7
2026	9	233,630.1	17,016.5	141,778.7	21,657.8	40,573.4	6,709.1	461,365.6	30.0	640.8
2026	10	226,819.4	15,996.8	146,698.8	18,087.9	39,019.4	6,598.5	453,220.8	31.0	609.2
2026	11	202,448.2	15,504.1	142,084.3	20,787.6	39,499.2	6,524.9	426,848.3	30.0	592.8
2026	12	217,891.2	12,984.8	147,014.6	20,859.0	39,681.2	6,635.2	445,065.9	31.0	598.2
2027	1	256,746.4	15,853.2	145,160.0	26,777.2	40,659.3	6,613.7	491,809.7	31.0	661.0
2027	2	196,220.8	14,340.6	131,147.6	23,346.0	39,929.3	6,459.6	411,443.8	28.0	612.3
2027	3	216,801.6	18,449.0	145,471.2	24,029.5	37,953.4	6,504.1	449,208.7	31.0	603.8
2027	4	204,417.2	15,411.3	140,894.2	21,793.0	39,260.3	6,546.3	428,322.2	30.0	594.9

Year	Month	ResEndUse.ResOther	NResEndUse.SmlGenOther	NResEndUse.GenOther	Sales.SmlInd	Sales.MedInd	Sales.Unm	mVars.OthrUse	mVars.Days	mVars.Other_AvgMW
2027	5	210,673.6	15,949.0	145,782.3	22,382.9	38,498.7	6,516.9	439,803.3	31.0	591.1
2027	6	204,097.9	15,457.7	141,195.1	20,959.4	39,732.5	6,621.4	428,064.1	30.0	594.5
2027	7	205,934.8	15,997.0	146,093.3	23,705.6	40,451.4	6,696.9	438,879.0	31.0	589.9
2027	8	231,366.7	16,020.8	146,226.9	21,494.7	41,026.9	6,701.1	462,837.1	31.0	622.1
2027	9	236,496.1	17,101.8	141,604.0	21,857.9	40,509.4	6,702.2	464,271.4	30.0	644.8
2027	10	229,327.9	16,068.5	146,493.8	18,285.8	38,974.3	6,591.3	455,741.6	31.0	612.6
2027	11	204,758.0	15,573.2	141,862.5	20,983.4	39,472.9	6,517.3	429,167.2	30.0	596.1
2027	12	220,506.7	13,025.3	146,761.0	21,052.6	39,673.8	6,627.3	447,646.6	31.0	601.7
2028	1	259,806.7	15,892.8	144,616.9	26,968.6	40,670.7	6,605.4	494,561.2	31.0	664.7
2028	2	206,226.5	14,889.5	135,339.6	23,535.2	39,959.5	6,451.0	426,401.4	29.0	612.7
2028	3	219,313.2	18,513.5	144,879.7	24,216.5	38,002.5	6,495.2	451,420.6	31.0	606.8
2028	4	206,665.1	15,448.7	140,298.3	21,977.9	39,328.3	6,537.1	430,255.3	30.0	597.6
2028	5	212,933.2	15,987.3	145,142.6	22,565.6	38,585.5	6,507.3	441,721.5	31.0	593.7
2028	6	206,382.3	15,494.5	140,552.7	21,139.9	39,838.2	6,611.5	430,019.1	30.0	597.3
2028	7	208,673.8	16,034.7	145,405.4	23,883.9	40,576.0	6,686.7	441,260.5	31.0	593.1
2028	8	234,423.9	16,060.0	145,551.4	21,674.0	41,152.8	6,690.6	465,552.7	31.0	625.7
2028	9	239,162.4	17,157.0	140,962.4	22,038.1	40,636.6	6,691.5	466,648.0	30.0	648.1
2028	10	231,649.0	16,110.7	145,843.5	18,466.9	39,102.8	6,580.4	457,753.2	31.0	615.3
2028	11	206,915.1	15,615.6	141,245.1	21,165.4	39,602.7	6,506.2	431,050.1	30.0	598.7
2028	12	222,976.8	13,039.6	146,135.5	21,235.5	39,804.9	6,616.0	449,808.4	31.0	604.6
2029	1	262,567.8	15,968.7	144,232.9	27,152.5	40,803.2	6,593.9	497,319.0	31.0	668.4
2029	2	200,691.4	14,446.0	130,299.7	23,720.0	40,093.4	6,439.3	415,689.8	28.0	618.6
2029	3	221,604.8	18,618.2	144,520.9	24,402.2	38,137.6	6,483.2	453,766.9	31.0	609.9
2029	4	208,731.0	15,526.6	139,963.2	22,164.5	39,464.8	6,524.9	432,374.9	30.0	600.5
2029	5	215,030.0	16,069.4	144,808.8	22,753.1	38,723.3	6,494.9	443,879.6	31.0	596.6
2029	6	208,535.4	15,575.4	140,241.9	21,328.4	39,977.3	6,598.9	432,257.3	30.0	600.4
2029	7	211,315.9	16,119.9	145,096.8	24,073.3	40,716.4	6,673.9	443,996.1	31.0	596.8
2029	8	237,365.8	16,145.5	145,244.3	21,863.6	41,293.2	6,677.8	468,590.0	31.0	629.8
2029	9	241,691.9	17,255.9	140,666.6	22,227.8	40,776.9	6,678.7	469,297.8	30.0	651.8
2029	10	233,823.9	16,196.7	145,539.2	18,656.9	39,243.1	6,567.5	460,027.3	31.0	618.3
2029	11	208,932.5	15,699.1	140,951.9	21,355.5	39,743.1	6,493.4	433,175.4	30.0	601.6
2029	12	225,284.4	13,095.0	145,834.0	21,425.8	39,945.2	6,603.2	452,187.6	31.0	607.8
2030	1	264,803.7	15,941.3	142,982.2	27,343.0	40,943.5	6,581.0	498,594.7	31.0	670.2
2030	2	202,385.1	14,421.4	129,170.6	23,910.6	40,233.6	6,426.4	416,547.7	28.0	619.9
2030	3	223,442.9	18,617.0	143,271.1	24,593.0	38,277.9	6,470.3	454,672.3	31.0	611.1
2030	4	210,408.5	15,500.4	138,754.1	22,355.5	39,605.0	6,512.0	433,135.5	30.0	601.6
2030	5	216,753.1	16,042.4	143,559.8	22,944.3	38,863.5	6,482.0	444,645.2	31.0	597.6
2030	6	210,354.9	15,549.5	139,033.4	21,519.7	40,117.5	6,586.0	433,161.0	30.0	601.6
2030	7	213,689.1	16,093.2	143,848.6	24,264.8	40,856.5	6,660.9	445,413.1	31.0	598.7
2030	8	240,044.2	16,118.7	143,995.5	22,055.5	41,433.3	6,664.9	470,312.0	31.0	632.1
2030	9	243,903.4	17,246.0	139,457.5	22,420.2	40,917.0	6,665.8	470,609.9	30.0	653.6
2030	10	235,622.5	16,169.9	144,289.2	18,849.8	39,383.1	6,554.6	460,869.1	31.0	619.5
2030	11	210,540.5	15,673.2	139,741.8	21,548.9	39,883.0	6,480.5	433,867.8	30.0	602.6

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Year	Month	ResEndUse.ResOther	NResEndUse.SmlGenOther	NResEndUse.GenOther	Sales.SmlInd	Sales.MedInd	Sales.Unm	mVars.OthrUse	mVars.Days	mVars.Other_AvgMW
2030	12	227,083.5	13,036.7	144,582.9	21,619.7	40,085.1	6,590.2	452,998.1	31.0	608.9
2031	1	266,930.9	15,924.1	142,001.1	27,537.3	41,083.3	6,568.1	500,044.8	31.0	672.1
2031	2	204,002.6	14,405.8	128,284.0	24,105.4	40,373.4	6,413.5	417,584.7	28.0	621.4
2031	3	225,195.8	18,626.0	142,289.3	24,788.3	38,417.6	6,457.5	455,774.4	31.0	612.6
2031	4	212,004.6	15,483.7	137,803.7	22,551.2	39,744.6	6,499.1	434,087.0	30.0	602.9
2031	5	218,391.2	16,025.2	142,577.5	23,140.5	39,003.1	6,469.1	445,606.5	31.0	598.9
2031	6	212,090.9	15,532.8	138,082.6	21,716.4	40,257.0	6,573.1	434,252.8	30.0	603.1
2031	7	215,974.6	16,075.9	142,865.6	24,462.0	40,996.0	6,648.1	447,022.1	31.0	600.8
2031	8	242,604.9	16,101.7	143,013.2	22,253.0	41,573.1	6,652.0	472,197.8	31.0	634.7
2031	9	245,987.7	17,245.9	138,507.6	22,618.1	41,057.2	6,652.8	472,069.3	30.0	655.7
2031	10	237,300.6	16,153.3	143,308.3	19,048.0	39,523.8	6,541.6	461,875.5	31.0	620.8
2031	11	212,041.8	15,657.3	138,793.1	21,747.4	40,024.0	6,467.4	434,731.0	30.0	603.8
2031	12	228,762.3	12,988.6	143,603.3	21,818.5	40,226.5	6,577.1	453,976.4	31.0	610.2
2032	1	268,875.9	15,952.7	141,299.8	27,736.5	41,225.1	6,555.0	501,644.9	31.0	674.3
2032	2	213,404.5	14,947.3	132,249.2	24,305.0	40,515.6	6,400.3	431,821.8	29.0	620.4
2032	3	226,787.4	18,681.7	141,589.8	24,988.2	38,560.1	6,444.2	457,051.4	31.0	614.3
2032	4	213,441.8	15,512.2	137,127.7	22,751.5	39,887.6	6,485.8	435,206.6	30.0	604.5
2032	5	219,856.4	16,054.9	141,879.9	23,341.1	39,146.4	6,455.8	446,734.5	31.0	600.5
2032	6	213,640.1	15,561.8	137,408.4	21,917.4	40,400.7	6,559.7	435,488.1	30.0	604.8
2032	7	218,019.3	16,106.3	142,170.0	24,663.3	41,140.1	6,634.6	448,733.5	31.0	603.1
2032	8	244,899.2	16,133.2	142,319.8	22,454.7	41,720.3	6,638.2	474,165.3	31.0	637.3
2032	9	247,848.0	17,294.0	137,838.8	22,820.1	41,207.5	6,638.7	473,647.1	30.0	657.8
2032	10	238,800.0	16,187.2	142,619.6	19,250.4	39,677.0	6,527.2	463,061.4	31.0	622.4
2032	11	213,400.0	15,691.3	138,128.9	21,950.2	40,180.4	6,452.6	435,803.4	30.0	605.3
2032	12	230,295.9	12,992.8	142,919.4	22,021.8	40,385.9	6,562.0	455,177.8	31.0	611.8
2033	1	270,647.9	16,024.0	140,861.7	27,940.1	41,387.6	6,539.6	503,400.9	31.0	676.6
2033	2	206,841.8	14,497.5	127,258.1	24,509.0	40,681.1	6,384.5	420,171.9	28.0	625.3
2033	3	228,257.5	18,782.3	141,156.8	25,192.6	38,728.7	6,428.1	458,546.1	31.0	616.3
2033	4	214,772.8	15,584.9	136,711.1	22,956.2	40,059.3	6,469.4	436,553.7	30.0	606.3
2033	5	221,220.8	16,131.3	141,452.0	23,546.2	39,321.1	6,439.1	448,110.5	31.0	602.3
2033	6	215,096.8	15,636.9	136,996.8	22,122.9	40,578.5	6,542.7	436,974.5	30.0	606.9
2033	7	219,969.0	16,185.1	141,747.1	24,869.2	41,320.9	6,617.2	450,708.5	31.0	605.8
2033	8	247,083.9	16,212.5	141,897.1	22,660.9	41,902.3	6,620.7	476,377.3	31.0	640.3
2033	9	249,605.7	17,387.7	137,429.7	23,026.6	41,390.6	6,621.1	475,461.5	30.0	660.4
2033	10	240,209.8	16,267.5	142,196.8	19,457.2	39,861.3	6,509.5	464,502.0	31.0	624.3
2033	11	214,681.8	15,769.3	137,719.9	22,157.3	40,365.8	6,434.8	437,128.8	30.0	607.1
2033	12	231,748.4	13,041.4	142,496.7	22,229.0	40,572.5	6,544.1	456,632.1	31.0	613.8

Request IR-42:

Appendix C: Forecast Comparison and Accuracy

(a) Is the data in this appendix weather normalized? If so, please provide the raw data and the normalization factors used.

Response IR-42:

(a) No.

Request IR-43:

Appendix D: Forecast Sensitivity Analysis

(a) Please provide the model outputs in electronic form.

(b) Please provide the full set of Oracle input data in electronic format so that it can be replicated.

(c) Please provide the historical data and forecasts used to develop the probability distributions for each variable used in the Monte Carlo analysis.

(d) Please provide the source data and calculations for Figure D8.

Response IR-43:

(a) Please refer to Attachment 1.

(b) Please refer to Attachment 2, filed electronically.

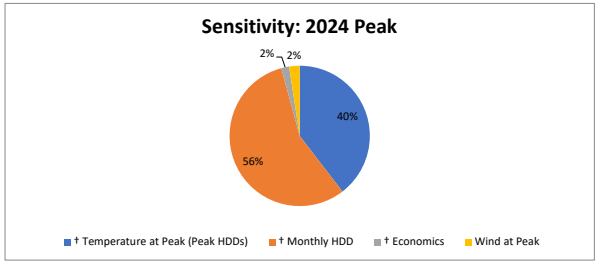
(c) Please refer to Attachment 2, filed electronically.

(d) Please refer to Partially Confidential Attachment 3.

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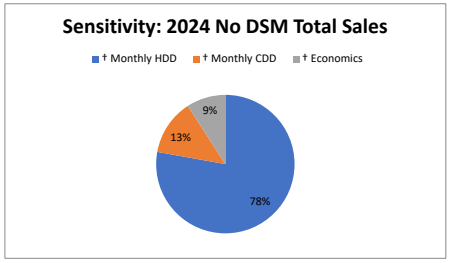
Sensitivity: 2024 Peak

Assumptions	ContributionToVariance	RankCorrelation
† Temperature at Peak (Peak HDDs)	0.395635578	0.503546271
† Monthly HDD	0.562004808	0.600152653
† Economics	0.018235666	0.108106679
Wind at Peak	0.024123948	0.124341444



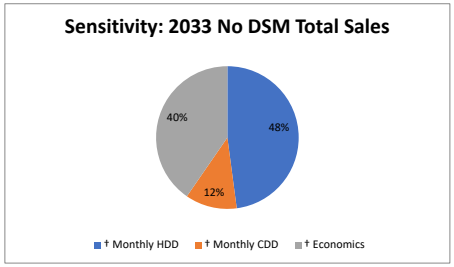
Sensitivity: 2024 No DSM Total Sales

Assumptions	ContributionToVariance	RankCorrelation
† Monthly HDD	0.778235387	0.861811518
† Monthly CDD	0.13049711	0.352904547
† Economics	0.091267503	0.295131042



Sensitivity: 2033 No DSM Total Sales

Assumptions	ContributionToVariance	RankCorrelation
† Monthly HDD	0.479020235	0.670473419
† Monthly CDD	0.117150259	0.331570789
† Economics	0.403829505	0.615607155



M11108 2023 Load Forecast Synapse IR-43 Attachment 2 has been filed electronically.

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Item	2023 Energy (GWh	2023 Peak (MW)	2033 Energy (GWh)	2033 Peak (MW)
Included in Forecast				
DSM (base case)	-121	-27	-1483	-272
Solar PV	-44	0	-551	0
[redacted]				
EV (current forecast)	10	2	1007	240
Other Possible Scenarios				
EV (current forecast, no peak mitigation)	10	4	1007	424
E3 Hybrid Scenario	0	0	-99	-257
Battery (5% share by 2033)	0	0	0	-135
Weather/Economics P10/P90	+/-217	+/-188	+/-279	+/-224

Request IR-44:

Nova Scotia Power Electrification Support Overview by E3

(a) Please provide the full report produced by E3 on this issue.

(b) Please provide any supplemental materials produced by E3 in developing these results.

Response IR-44:

(a) The report was provided as Appendix E in the 2022 Load Forecast Report. Please refer to Attachment 1.

(b) Please refer to Attachment 2 for the EV load shape data and Attachment 3 for the space heating data provided by E3.

Nova Scotia Power Electrification Support

Load Forecast Inputs – Overview

April 2022

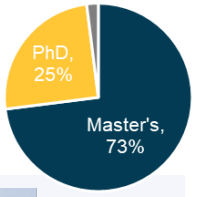


Liz Mettetal, PhD
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Michaela Levine
Arne Olson
Dan Aas

Energy+Environmental Economics

About E3

90+ full-time consultants | 30 years of deep expertise | Engineering, Economics, Mathematics, Public Policy…




San Francisco

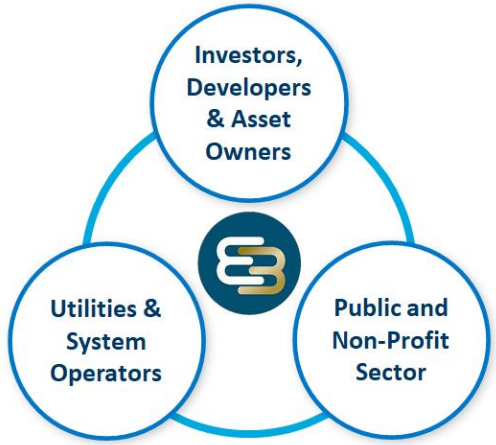

New York


Boston


Calgary

E3 Clients

300+ projects per year across our diverse client base

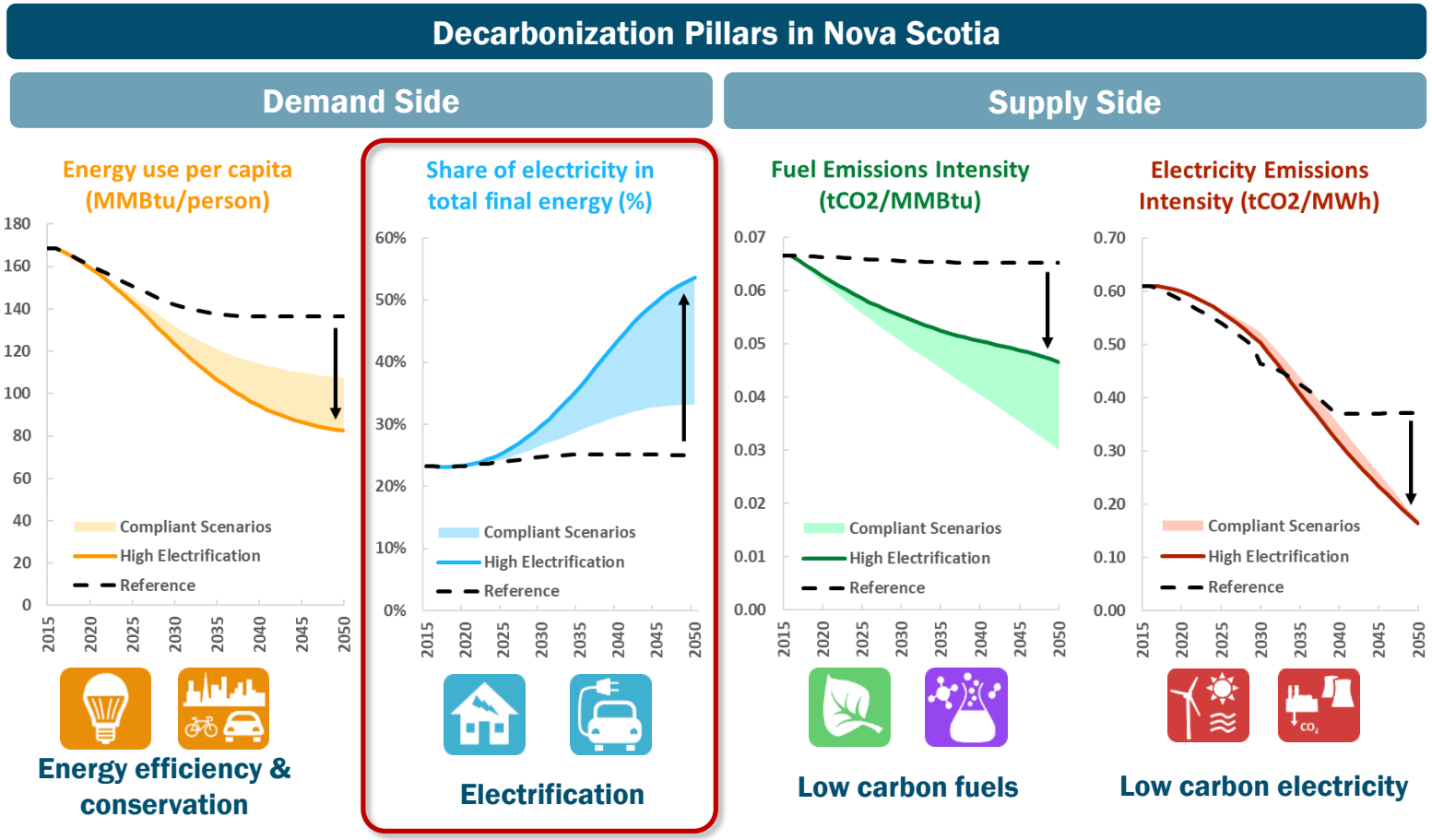


Recent Related Projects

- **Nova Scotia Power Integrated Resource Planning Support & ongoing Electrification Strategy Report**
- **Transportation Electrification Plans/Roadmaps for Xcel Colorado (2020), Arizona (2021), and Hawaii (HECO)**
- **Building Electrification Studies for EWEB (Eugene, Oregon), California, Utah**
- **Net Zero New England: Electric Reliability under Deep Decarbonization**

Electrification is key to achieving Net-Zero in Nova Scotia

- **In decarbonization modeling in Nova Scotia, consistent with the Canadian Net-Zero study, near-complete electrification of transportation and most buildings is a "safe bet"**
  - Measures are lower cost and commercially available to support economy-wide decarbonization
- **Electrification must be pursued in parallel to aggressive power sector GHG reductions, which remains a Net Zero lynchpin, with supporting energy efficiency and conservation**



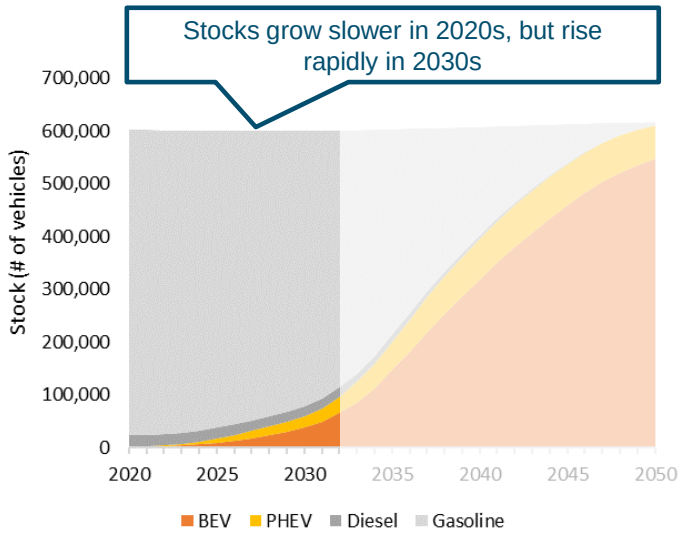
Source: E3 Nova Scotia Power PATHWAYS Phase 1 Report (Feb 2020)

Electric Vehicle Adoption Stock Rollover

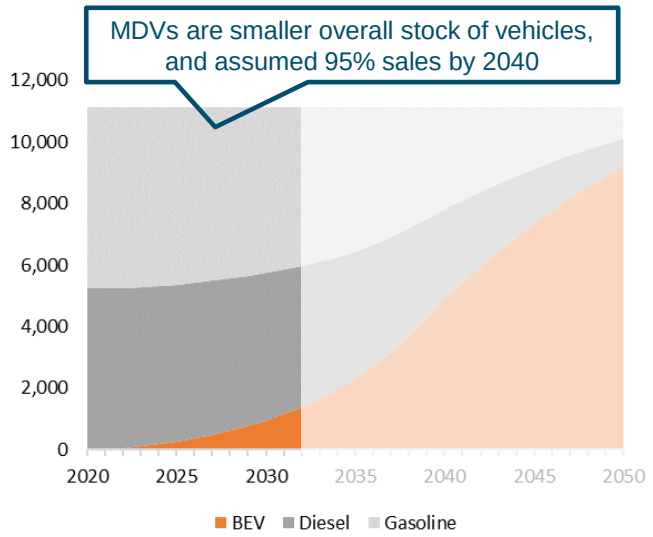
+ EV adoption/stock estimate was developed in E3's PATHWAYS stock rollover model

- PATHWAYS is an infrastructure-based model reflecting vehicle lifetimes and relationship of sales to stocks
- Light-duty vehicle (LDV) forecast assumes 100% electric LDV sales by 2035, with the base forecasts relying on a "slow sales ramp" scenario that achieves 30% electric LDV sales by 2030

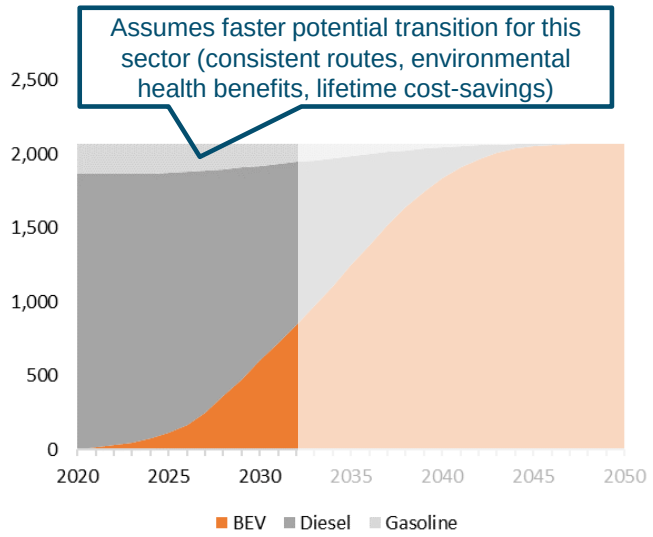
Light-Duty Vehicle Stocks



Parcel Truck/MDV Stocks

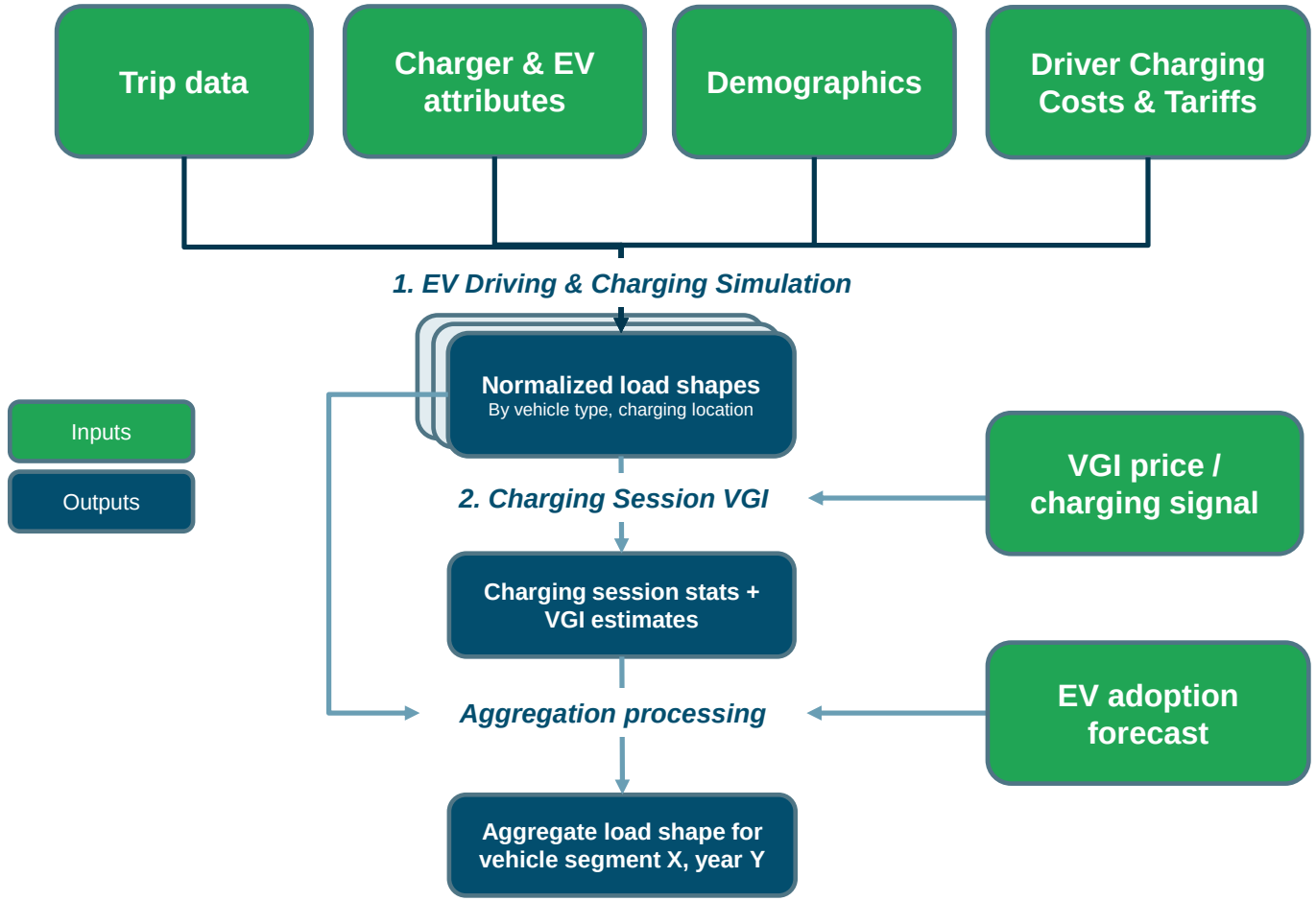


Bus Stocks



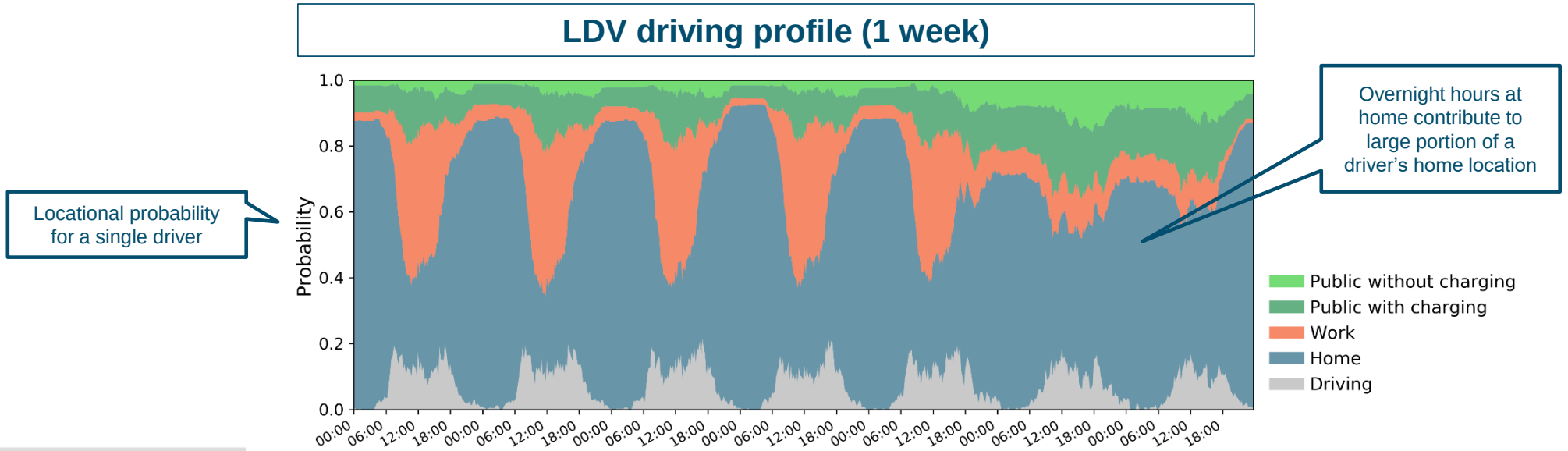
Transportation Load Shaping Process

- **E3 generates forecast of transportation load shape based on simulations of EV driving and charging behavior, using travel survey data**
  - Population characterized by vehicle type, charging access, cost of charging, etc.
  - Drivers choose where and when to charge based on minimizing cost subject to constraints
- **Modeling based on Nova Scotia population and driving statistics**



Profiles for light-duty vehicle drivers were developed to inform future charging patterns

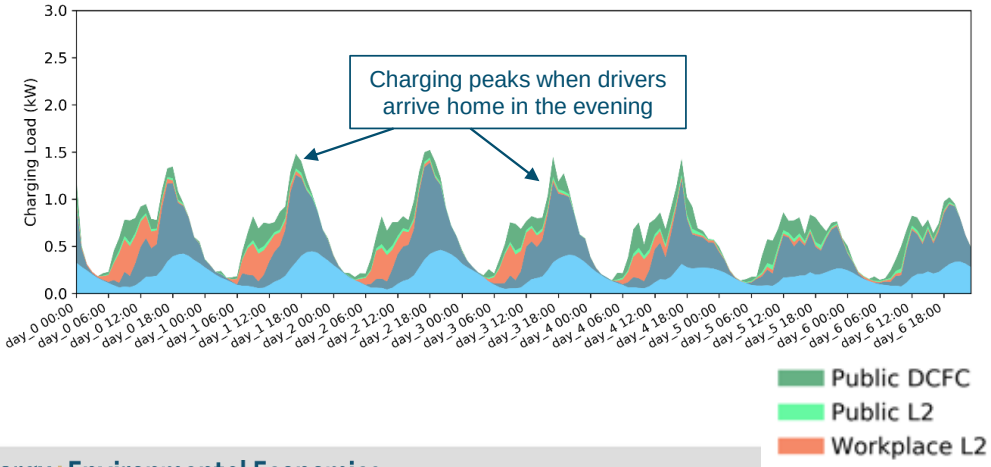
- The driving profile shows the probability of a vehicle being at each location type, based on National Household Travel Survey data for New England (assumed to be representative of driving patterns in Nova Scotia)
- Drivers are assumed to drive 10,830 miles/year (17,430 km/year) based on historical Nova Scotia VMT statistics
- The simulated driving profiles are used as an input in the EV Load Shape Tool



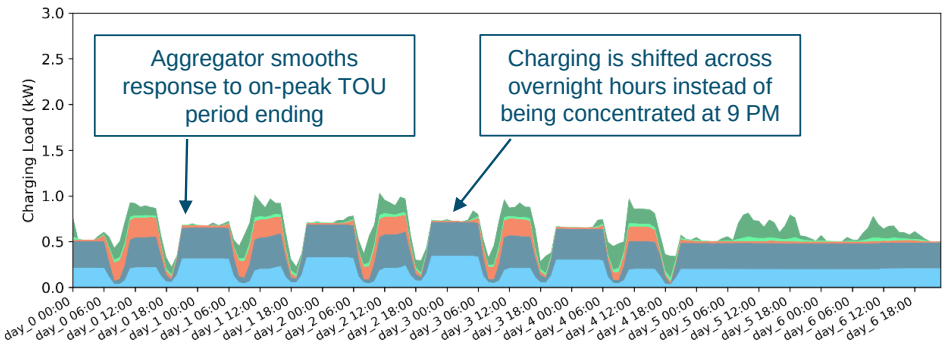
LDV Charging Profiles

- **Charging profiles represent population-level charging scaled down to one vehicle**
- **In unmanaged charging, drivers begin charging immediately upon arrival at their charging location**
- **Managed charging shifts timing of charging to reduce charging costs (based on time-varying rates)**
  - Managed charging shown assumes NSP or a third-party aggregator performs additional coordinated charge management across EVs to flatten peak loads during off-peak periods.
  - This smooths the sharp increase in charging that occurs in the “Managed” case when the on-peak TOU period ends
  - E3’s input into the forecast assumes about 70% manage their charging with an aggregator

Unmanaged charging profile (winter, one week)



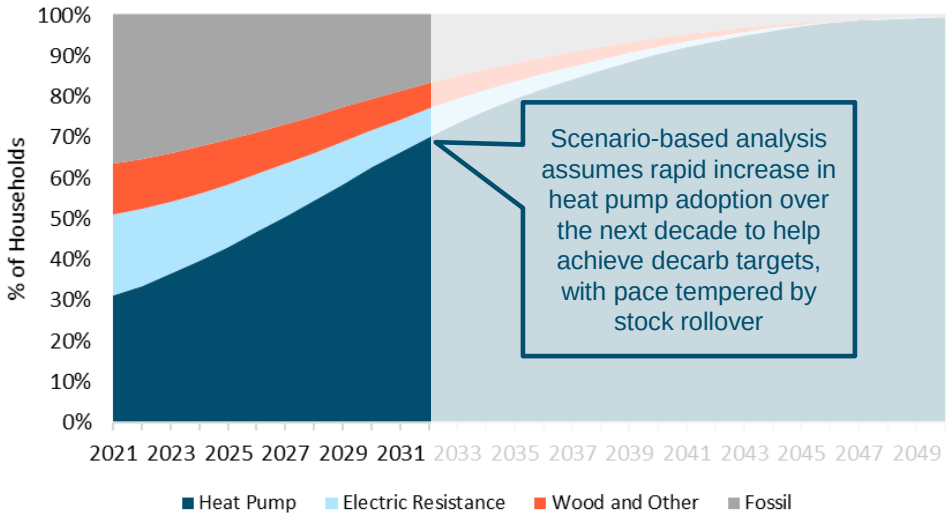
Managed charging profile w/ VGI Aggregator (winter, one week)



Heating Equipment Stock Rollover

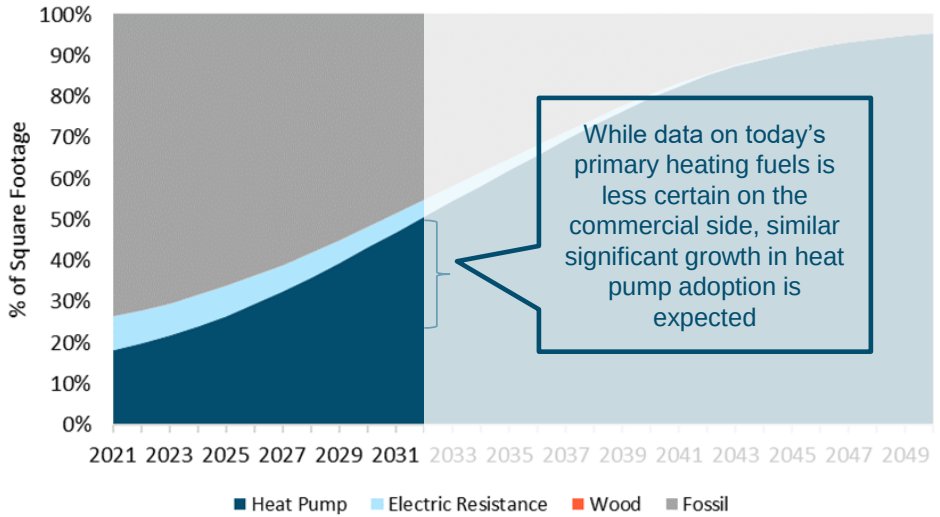
+ **E3's electrification study scenarios ultimately yield near-complete electrification of residential and commercial buildings by 2050; to achieve policy targets, E3 scenarios assume most sales are heat pumps sales by 2030s**

Residential Building Stocks



** Both graphs reflect primary heating source*

Commercial Building Stocks



** Starting breakdown of heating fuel varies from NSP forecast given lack of data and reporting differences (e.g., primary heating source) – however, growth in HPs is aligned with NSP*

M11108 2023 Load Forecast Synapse IR-44 Attachment 2 has been filed electronically.

M11108 2023 Load Forecast Synapse IR-44 Attachment 3 has been filed electronically.

Request IR-45:

General Forecast Report Improvements – The Board Decision of October 31, 2022 notes that NS Power agreed to the following changes in the 2023 forecast report (p 4):

> **In its Reply, NS Power addressed the concerns raised by the intervenors. NS Power agreed to include analysis of the impact of multi-hour temperature averages and windspeed on the peak in the next forecast. As well, it agreed to investigate multi-station weather for peak load forecasting and to review the methods for integrating weather data with stakeholders before filing the next forecast. NS Power will incorporate water heating load control and provide a peak sensitivity analysis in the 2023 report that is similar to the sensitivity analysis in Appendix D.**
>
> **NS Power intends to refine the impact of electrification through examining existing measures and trends to achieve government electrification goals. It will investigate and include commercial and industrial electrification impacts after 2027. NS Power will evaluate the findings from the recent Itron Report on the impact of heat pumps. Information from the SGNS project and water heating load control will be incorporated in the next report. EV adoption rates will be updated in the forecast and more details on the EV high and low cases will be provided. NS Power will review how an ELCC adjustment could be applied to EV load shapes.**
>
> **Changes to the DR estimates in the IRP Action Plan will be incorporated into the forecast. NS Power will consider hybrid scenarios where customers keep their existing non-electric heating as backup, through the 2022 IRP Evergreen process, as well as a scenario analysis for ETS to moderate peak load. It will monitor growth in heating load for commercial customers and work with EOne on possible firm peak mitigation strategies.**
>
> **NS Power confirmed that the model used a COP of 2.3 at -15oC for new heat pumps. It clarified that an analysis removing lock-out temperature is in the IRP Action Plan. NS Power will continue consulting with EOne and other stakeholders on DR implementation. NS Power confirmed that about 15 percent of the commercial and industrial DSM effects are allocated to the industrial class and 85 percent are allocated to the commercial class. It also confirmed that the DSM coefficients vary each year and the change to the commercial and industrial adjustment is the result of underlying end-use data, particularly the commercial lighting efficiency and intensity.**

NS Power's reply submission did not agree with a few of the intervenors' requests. NS Power does not consider the line loss determination model as a tool for load planning and said a report on this topic is not required. NS Power considers an ELCC factor is not needed for the Large Industrial Interruptible Rider (LIIR) because these customers do not contribute to peak demand needs; however, it will considers applying an ELCC adjustment to EV load shapes. A request for the information on the benefits and costs of commercial electrification programs was denied as NS Power has not performed such an analysis.

(a) Please indicate how this report incorporates each of these agreed changes.

Response IR-45:

Please refer to the following table:

Recommendations Agreed To	Status	Notes
Include analysis of the impact of multi-hour temperature averages and windspeed on the peak in the next forecast.	Included	Please refer to Section 4.2 at page 21.
Investigate multi-station weather for peak load forecasting and to review the methods for integrating weather data with stakeholders before filing the next forecast.	Included	Please refer to Section 4.2 at page 24.
Incorporate water heating load control and provide a peak sensitivity analysis in the 2023 report that is similar to the sensitivity analysis in Appendix D.	Included	Please refer to Section 10 at page 78.

Recommendations Agreed To	Status	Notes
Refine the impact of electrification through examining existing measures and trends to achieve government electrification goals.	Included	Please refer to the updated EV sales targets provided in Section 4.4 at page 38.
Investigate and include commercial and industrial electrification impacts after 2027.	Included	Please refer to Section 4.4 at page 50.
Evaluate the findings from the recent Itron Report on the impact of heat pumps.	Included	Please refer to Section 4.4 at page 36.
Information from the SGNS project and water heating load control will be incorporated in the next report.	Included	Please refer to Section 10 at page 78.
EV adoption rates will be updated in the forecast and more details on the EV high and low cases will be provided.	Included	Please refer to Section 4.4 at page 40.
Review how an ELCC adjustment could be applied to EV load shapes.	Deferred	Will be evaluated in a future capacity value study.
Changes to the DR estimates in the IRP Action Plan will be incorporated into the forecast.	Included	Please refer to Section 10 at page 77.

Recommendations Agreed To	Status	Notes
Consider hybrid scenarios where customers keep their existing non-electric heating as backup, through the 2022 IRP Evergreen process, as well as a scenario analysis for ETS to moderate peak load.	Included	The impact of a hybrid scenario is included in Appendix D page 8. NS Power incorporated three scenarios using a Hybrid Peak forecast in the evergreen IRP Final Modeling Results Release dated May 29, 2023; these scenarios are noted as using electrification forecast "E2".
It will monitor growth in heating load for commercial customers and work with EOne on possible firm peak mitigation strategies.	Work ongoing	Please refer to Section 10 at page 79.

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Request IR-46:

General Forecast Report Improvements – The Board Decision of October 31, 2022 Includes the following findings (pp 5-6):

> **The Board notes that NS Power has agreed to many of the intervenors' recommendations and acknowledges this commitment as a positive step toward continuous improvement of the Load Forecast. The Board directs NS Power to proceed with implementing the recommendations it has agreed to in the next Load Forecast report, including providing greater details and investigation of the impact to energy and peak from electrification as well as from new technologies, especially findings from pilot projects. Further, NS Power is directed to continue evaluating and implementing improvements to the calculation of weather-normalized values for energy and peak as recommended by intervenors.**
>
> **The Board directs NS Power to evaluate the model's economic inputs, including the COVID-19 variable and the assumptions and calculations used to assess the impact of DSM, Solar PV, EVs, battery storage, and weather.**
>
> **The Board acknowledges the intervenors' participation in examining changes to the Load Forecast. The Board directs NS Power to continue to actively engage with intervenors as well as other stakeholders and their consultants well in advance of filing its 2023 Load Forecast Report. As many of the recommendations made by intervenors are important to discuss in the initial stakeholder meeting, it is prudent that NS Power share how potential impacts were evaluated and what was incorporated into the forecast early in the process.**
>
> **In addition to the above directives, the Board encourages NS Power to include information on each of the following in future load forecasts:**
>
> - **Examine the elasticity used in the SAE model to exclude elasticities calculated from non-winter peaking utilities or to apply elasticities from Canadian studies of Canadian electric utilities;**
>
> - **Evaluate the input variables in the residential model and test, over a period of time, if alternative inputs make the residential model more robust, considering the following:**

- **Given the continued population growth in Nova Scotia and ongoing housing shortage in the province, re-evaluate the use of housing completions for the near-term;**

- **Given the current inflationary environment, evaluate the use of Median Household Income in place of Total Household Income, as it is biased by outliers. Should the Conference Board of Canada be unable to provide the Median, NS Power could use data published by Statistics Canada and apply the Conference Board of Canada's annual growth rate to estimate the long-term Median Household Income;**

- **Consider incorporating household size and age of household residents, to determine if a better understanding of demand on load by time of day is achieved.**

(a) Please indicate how this report incorporates each of these directives.

Response IR-46:

Please refer to the table below.

Category	UARB Comments	Status	Notes
NSUARB Direction	The Board directs NS Power to proceed with implementing the recommendations it has agreed to in the next Load Forecast report, including providing greater details and investigation of the impact to energy and peak from electrification as well as from new technologies, especially findings from pilot projects.	Please refer to NSUARB IR-45.	Please refer to NSUARB IR-45.
	NS Power is directed to continue evaluating and implementing improvements to the calculation of weather-normalized values for energy and peak as recommended by intervenors.	Included	Weather normalized values are used for energy and peak throughout the 2023 Load Forecast report.
	The Board directs NS Power to evaluate the model's economic inputs, including the COVID-19 variable and the assumptions and calculations used to	Included	This is updated annually and found throughout the 2023 Load Forecast report.

Category	UARB Comments	Status	Notes
	assess the impact of DSM, Solar PV, EVs, battery storage, and weather.		
	The Board directs NS Power to continue to actively engage with intervenors as well as other stakeholders and their consultants well in advance of filing its 2023 Load Forecast Report.	Completed.	NS Power held a stakeholder conference on March 31, well in advance of the submission of the 2023 Load Forecast report.
NSUARB Suggestions ("encourage")	Examine the elasticity used in the SAE model to exclude elasticities calculated from non-winter peaking utilities or to apply elasticities from Canadian studies of Canadian electric utilities.	Please refer to NSUARB IR-10	Please refer to NSUARB IR-10
	Evaluate the input variables in the residential model and test, over a period of time, if alternative inputs make the residential model more robust, considering the following: - Given the continued population growth in Nova Scotia and ongoing housing shortage in the province, re-evaluate the use of housing completions for the near term; - Given the current inflationary environment, evaluate the use of Median Household Income in place of Total Household Income, as it is biased by outliers. Should the Conference Board of Canada be unable to provide the Median, NS Power could use data published by Statistics Canada and apply the Conference Board of Canada's annual growth rate to estimate the long-term Median Household Income; - Consider incorporating household size and age of household residents, to determine if a better understanding of demand on load by time of day is achieved.	• Housing Completions – Re-evaluation considered. • Median Household Income - Included. • Household Metrics – Not included	• Housing completions are still the best measure; please refer to Section 4.3 at page 28 and NSUARB IR-03 • Median Household Income is discussed in section 4.3 at page 27 • Household size and demographics will be investigated for a future forecast.
	Revisit the short-term economic inputs provided by the Conference Board of	Included.	These metrics are updated annually and included in

Category	UARB Comments	Status	Notes
	Canada to ensure data are close to those used in the forecasts of Canada's major Banks.		the 2023 Load Forecast report.
	Revisit the model's EV adoption rates and examine EV rebates to ensure that the model is using data that is in line with the data reported by Statistics Canada and Nova Scotia Open data.	Please refer to NSUARB IR-07	Please refer to NSUARB IR-07
	With respect to the unresolved status of large infrastructure projects, NS Power is encouraged to maintain communications with those customers to ensure system adequacy.	Ongoing.	NS Power is in contact with those customers on a regular basis.

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