NON-CONFIDENTIAL

Request IR-01:

Please explain the method used by EfficiencyOne and NSPI in setting the investment level of $34.05 million for the proposed 2019 DSM Plan. (EfficiencyOne 2019 DSM Plan Filing – Evidence, Page 19 of 23, Line 15)

Response IR-01:

The 2019 DSM Resource Plan investment level reflects the $34,050,000 identified in the *Electricity Plan Implementation (2015) Act*.[1]

The *Electricity Plan Implementation (2015) Act* was drafted to support rate stability for NS Power's Rate Stability Period of 2017-2019 by, *inter alia*, requiring NS Power to develop a Fuel Stability Plan and providing predictability for the 2019 DSM investment. The legislation achieved this predictability for the 2019 DSM investment by introducing a continuation approach, which essentially extended the 2016-2018 DSM Resource Plan, and set a corresponding 2019 DSM investment amount of not greater than $34,050,000. This amount is the annual average of the UARB-approved investment for the 2016-2018 DSM Resource Plan.

The energy and demand targets for 2019 were also developed based on the approved 2016-2018 DSM Resource Plan, following the continuation approach established in the *Electricity Plan Implementation (2015) Act*, with targets that are similar to the annual averages for the approved 2016-2018 DSM Resource Plan.

[1] The legislation states: "(1) Notwithstanding clause 79I(2)(a) of the *Public Utilities Act*, for the calendar year 2019, Nova Scotia Power shall enter into an agreement with the electricity efficiency and conservation franchise holder for the provision of electricity efficiency and conservation activities in an amount not greater than $34,050,000. (2) Sections 79J, 79L and 79M of the Public Utilities Act apply mutatis mutandis to the agreement referred to in subsection (1)." *Electricity Plan Implementation (2015) Act*, SNS 2015, c 30, s 20.

NON-CONFIDENTIAL

Request IR-02:

Please explain the reasons for setting the energy savings and demand savings targets of 127.2 GWh and 20.2 MW, respectively, for 2019 DSM Plan. (EfficiencyOne 2019 DSM Plan Filing – Evidence, Page 19 of 23, Line 13)

Response IR-02:

EfficiencyOne set the 2019 net energy and net demand savings targets (127.2 GWh and 20.2 MW, respectively) at levels similar to the approved annual averages in the 2016-2018 DSM Resource Plan (135.3 GWh and 20.8 MW, respectively) to align with the continuation approach established in the *Electricity Plan Implementation (2015) Act.* The variance between the 2019 targets and 2016-2018 approved annual averages is due to the allocation of $1M for demand reduction initiatives and 2017 evaluation results.

The energy savings target of 127.2 GWh will allow EfficiencyOne to continue offering cost-effective energy savings to Nova Scotians, while diversifying its energy savings. Compared to the 2016-2018 DSM Resource Plan, there is a smaller variance for demand savings (-3%) than energy savings (-6%); this is due to updated demand savings results from recent evaluations.

NON-CONFIDENTIAL

Request IR-03:

Please explain the method used by EfficiencyOne in breaking down proposed 2019 DSM Plan total annual budget and energy savings and demand targets by program types listed in Table 1, Appendix A of 2019 DSM Plan Filing.

Response IR-03:

EfficiencyOne considered the following factors in the development of the 2019 DSM Plan:

a. UARB-approved 2016-2018 DSM Resource Plan (budget, energy savings, and demand savings);
b. 2014-2017 results (expenditure, energy savings, and demand savings);
c. Program participation; and
d. Program impact and process evaluations, including evaluated savings results, Delivery Agent input, and participant feedback.

EfficiencyOne developed a spreadsheet to compare details from the approved 2016-2018 DSM Resource Plan and recent evaluated results (2014-2017), including budget, energy savings, demand savings, and unit costs. Please refer to Attachment 1 of EfficiencyOne's response to SBA IR-06 for this spreadsheet. EfficiencyOne then drafted 2019 program budgets and energy and demand targets reflecting anticipated program uptake and a desire to diversify energy savings.

NON-CONFIDENTIAL

Request IR-04:

Please explain the reason for not performing the cost-effectiveness testing for selecting proposed programs for 2019.

Response IR-04:

EfficiencyOne did not perform cost-effectiveness testing as the 2019 DSM Resource Plan was developed based on the continuation of the 2016-2018 DSM Resource Plan's cost-effective mix of programs. Given the limited changes to measures and programs within the portfolio, EfficiencyOne is confident that all proposed programs are cost-effective. This is demonstrated by maintaining similar unit costs to the 2016-2018 DSM Resource Plan.

However, in response to an Information Request, EfficiencyOne has provided both PAC and TRC cost-effectiveness test results for these programs. Please refer to EfficiencyOne's response to Synapse IR-05 a) for these cost-effectiveness test results.

NON-CONFIDENTIAL

Request IR-05:

Please provide analysis (reports, memos, presentations, excel work papers) performed by EfficiencyOne to support the following statement made in the Filing (EfficiencyOne 2019 DSM Plan Filing – Evidence, Page 19 of 23, Line 2): "EfficiencyOne is confident that the programs proposed in 2019 are cost-effective."

Response IR-05:

Please refer to EfficiencyOne's response to SBA IR-04 for context on why EfficiencyOne is confident that the proposed 2019 programs are cost-effective, and Synapse IR-05 a) for cost-effectiveness testing results.

NON-CONFIDENTIAL

Request IR-06:

Please provide any economic analysis (reports, memos, presentations, excel work papers) of proposed 2019 DSM Plan performed by EfficiencyOne in addition to the analysis conducted for the forward-looking Rate and Bill Impact Analysis (RBIA) included in Appendix C of the Application.

Response IR-06:

Please refer to Attachment 1 of this response, filed electronically, for the electronic model used to develop the 2019 DSM Resource Plan.

The electronic model was used to compare results from recent years (2014 – 2017) to those of the approved 2016-2018 DSM Resource Plan. This was completed at both the program level, and the program component level. The intention was to develop targets and budgets that were informed by the approved 2016-2018 DSM Resource Plan and actual results from recent years. ENS also used the electronic model to reproduce and update similar graphs and tables from past filings.

Please refer to EfficiencyOne's response to Synapse IR-06 for the modelling approach used within this electronic model, and how it compares to EfficiencyOne's fully-modelled approaches (e.g. as used for the 2016-2018 DSM Resource Plan).

NON-CONFIDENTIAL

Request IR-07:

Regarding the savings from lighting and non-lighting measures:

a) Please provide the energy and demand savings of DSM programs offered in 2017 by breaking down among lighting and non-lighting measures.

b) Please provide the estimated energy and demand savings for each DSM program that are being offered in 2018 and 2019 by breaking down among lighting and non-lighting measures.

Response IR-07:

a) The program savings achieved in 2017 are as follows:

DSM Program (2017)	Energy Savings (GWh)		Demand Savings (MW)	
	Lighting Measures	Non-Lighting Measures	Lighting Measures	Non-Lighting Measures
Efficient Product Rebates (Residential)	17.7	4.9	2.7	0.3
Existing Residential	12.3	15.6	1.5	5.7
New Residential	0.0	3.4	0.0	1.0
Efficient Product Rebates (BNI)	40.1	6.5	6.6	0.7
Custom Incentives	2.8	19.6	0.8	3.1
Direct Installation	6.3	1.6	1.1	0.3
Total	79.2	51.5	12.6	11.1

NON-CONFIDENTIAL

b) Based on the 2018 Mid-Course Adjustment and the proposed 2019 DSM Resource Plan, EfficiencyOne estimates the breakdown to be as follows:

DSM Program (2018)	Energy Savings (GWh)		Demand Savings (MW)	
	Lighting Measures	Non-Lighting Measures	Lighting Measures	Non-Lighting Measures
Efficient Product Rebates (Residential)	14.7	4.6	2.3	0.3
Existing Residential	11.7	16.8	1.4	6.6
New Residential	0.0	4.6	0.0	1.3
Efficient Product Rebates (BNI)	43.5	7.0	7.1	0.8
Custom Incentives	3.3	22.6	0.9	3.6
Direct Installation	7.6	2.0	1.3	0.4
Total	80.8	57.5	13.0	12.9

DSM Program (2019)	Energy Savings (GWh)		Demand Savings (MW)	
	Lighting Measures	Non-Lighting Measures	Lighting Measures	Non-Lighting Measures
Efficient Product Rebates (Residential)	11.4	3.5	1.3	0.2
Existing Residential	11.6	19.4	1.4	5.6
New Residential	0.0	5.3	0.0	1.6
Efficient Product Rebates (BNI)	28.0	4.5	4.6	0.5
Custom Incentives	4.1	30.2	0.7	2.9
Direct Installation	7.4	1.9	1.2	0.3
Total	62.4	64.8	9.1	11.1

NON-CONFIDENTIAL

Request IR-08:

Regarding the lighting measures included in EfficiencyOne DSM portfolio:

a) Please provide any research studies commissioned by EfficiencyOne in estimating market penetration levels and free-ridership ratios of the lighting measures included in DSM portfolio. Please note the date of each of the above study.

b) Please state how the studies identified in part (a), if any, have been used to selecting lighting measures in both ongoing 2018 DSM Plan and proposed 2019 DSM plan.

c) Please supply a table that includes free-ridership ratio assumed for lighting measures included in each of the DSM program of 2016, 2017, 2018, and 2019. Furthermore, for 2016 and 2017, please provide evaluated free-ridership ratios of the lighting measures included in each of the program.

Response IR-08:

a) EfficiencyOne has commissioned Residential Socket Studies in 2011 and 2016 related to estimating the market penetration of lighting measures. Please refer to Attachments 1 and 2 of this IR response for these studies.

As part of the 2017 Evaluation of programs, the Evaluation Consultant included Market Evolution analyses for the Instant Savings program component (Section 8 of the Residential Efficient Product Rebates Evaluation Report) and the Business Energy Rebates program component (Section 7 of the BNI Efficient Product Rebates Evaluation Report). These sections comment on the level of transformation and saturation of residential and commercial LEDs in the market.

Please refer to part c) of this IR response for free-ridership levels.

NON-CONFIDENTIAL

b) The Residential Socket Studies and the Market Evolution sections of the 2017 Evaluation Reports provide EfficiencyOne with information on the level of saturation of LED lighting. This is used to help inform program decisions and offerings.

For example, in the Executive Summary of the 2017 Evaluation Reports, the Evaluation Consultant noted the following:

> "The Evaluator concludes that LEDs remain in a growth phase and are approaching maturity as both the residential and BNI sectors increasingly adopt LEDs. Growth in LED sales is expected to continue in the years ahead since more efficient technology is not currently available and Canadian energy efficiency regulations will not impact LED lamps and fixtures in the near future. Also, the savings generated by LED products are expected to decline because the baseline efficiency for lighting will increase."[1]

These studies provide high-level information about overall lighting saturation; however, they do not provide information pertaining to specific lighting measures or products. In accordance with this information, lighting will continue to play an important role in achieving electrical energy savings in the years to come. However, EfficiencyOne is also seeking to further encourage Nova Scotians to also make choices to reduce electricity in other ways. As such, compared to previous years, the 2019 DSM Resource Plan places a greater emphasis on program components that are focused on non-lighting measures. No changes are planned for 2018 due to the research identified above.

[1] 2017 DSM Programs Evaluation, Executive Summary, Efficiency Nova Scotia, p. 35-36.

NON-CONFIDENTIAL

c) Please refer to Table 1, below, for the requested information for 2016-2019. Where available, free-ridership levels are presented for lighting measures. Instant Savings, Efficient Product Installation, and Business Energy Rebates (Instant Rebates) have free-ridership levels at the lighting measure level. All other programs containing lighting measures have free-ridership levels determined at a program level (which includes all eligible measures).

NON-CONFIDENTIAL

Table 1: Assumed and Evaluated Free-Ridership Levels for 2016-2019

		Assumed Free-Ridership Levels				Evaluated Free-Ridership Levels	
		2016[1]	2017[2]	2018[3]	2019[3]	2016	2017
Residential	**Efficient Product Rebates**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Instant Savings	N/A	N/A	N/A	N/A	N/A	N/A
	(CFLs only)	N/A	N/A	0.0	0.0	N/A	0%
	(LEDs only)	37%	33%	32%	32%	33%	32%
	Appliance Retirement	-	-	-	-	-	-
	Existing Residential	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Home Energy Assessment	-	-	-	-	-	-
	Green Heat	-	-	-	-	-	-
	Efficient Product Installation (LEDs only)[4]	N/A	N/A	25%	25%	N/A	25%
	Rental Properties & Condos (LEDs only)[5]	32%	30%	N/A	N/A	30%	N/A
	First Nations Home Energy Efficiency Pilot[6]	N/A	N/A	N/A	N/A	N/A	N/A
	New Residential	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	New Home Construction	-	-	-	-	-	-
	Passive House (pilot)	-	-	-	-	-	-
Business, Non-Profit and Institutional (BNI)	**Efficient Product Rebates**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Business Energy Rebates - Mail-In Rebates	17%	16%	14%	14%	16%	14%
	Business Energy Rebates - Instant Rebates[7]	16%	24%	27%	27%	24%	27%
	Lighting	17%	N/A	N/A	N/A	N/A	N/A
	LED Linear Fixture	N/A	37%	32%	32%	37%	32%
	LED Downlight Fixtures	N/A	37%	36%	36%	37%	36%
	LED Linear Lamps	N/A	34%	38%	38%	34%	38%
	LED General use/Decorative Lamps	N/A	35%	38%	38%	35%	38%
	Custom Incentives	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Custom	6%	9%	9%	9%	9%	9%
	Retrofit	8%	10%	9%	9%	10%	9%
	New Construction/Building Optimization	0%	0%	0%	0%	0%	0%
	Energy Management Information Systems	-	-	-	-	-	-
	Strategic Energy Management	-	-	-	-	-	-
	Direct Installation	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Small Business Energy Solutions	12%	17%	12%	12%	17%	12%

Please see next page for table footnotes

NON-CONFIDENTIAL

Footnotes for Table 1

A dash (-) indicates no lighting measures are offered.

N/A indicates that the free-ridership levels were either not calculated or not applicable at that time.

All free-ridership values can be found in the DSM Evaluation Reports filed annually with the Nova Scotia Utility and Review Board.

[1] The assumed free-ridership levels for 2016 are based on evaluated 2015 results.

[2] The assumed free-ridership levels for 2017 are based on evaluated 2016 results.

[3] The assumed free-ridership levels for 2018 and 2019 are based on evaluated 2017 results.

[4] Information presented for Efficient Product Installation (EPI) excludes low income participants as free-ridership is not applicable to low income participants.

[5] In 2017, Rental Properties & Condos and Residential Direct Installation were merged to form EPI.

[6] The First Nations Home Energy Efficiency Pilot was not evaluated.

[7] Free-ridership levels shown for Business Energy Rebates – Instant Rebates are an average of all measure types (lighting and non-lighting) for this service and are shown for contextual purposes only. Lighting types that have separate free-ridership values are shown (e.g., Lighting, LED Linear Fixture).

2011 Socket Study

Final Report

Reproduction in whole or in part is not permitted without the express permission of
Efficiency Nova Scotia

Prepared for:

efficiency NOVA SCOTIA CORPORATION

December 2011

CRA CORPORATE RESEARCH ASSOCIATES

www.cra.ca
1-888-414-1336

Marketing Research and Intelligence Association · L'Association de la Recherche et de l'Intelligence Marketing · Accredited Gold Seal Corporate Member · MRIA ARIM

Table of Contents

Page

Introduction 2

Executive Summary 3

Detailed Analysis 4

Light Bulb Count and Usage 11

Intentions to Implement Energy Efficient Light Bulbs 19

In-Home Verification Visits 21

Study Methodology 23

Appendix A – Study Questionnaire

Appendix B – Tabular Results

Introduction

This report presents the results of the **2011 Socket Study** conducted by Corporate Research Associates Inc. on behalf of Efficiency Nova Scotia. The overall goal of this study was to determine market penetration of energy efficient lighting (CFL and LED bulbs) and identify the degree of market transformation that has taken place in the efficiency sector. More specifically, this study sought to:

- Provide information on the type of bulbs present in each socket on the respondent's property;
- Estimate the number of hours of use of each type of lighting; and
- Probe intentions to implement energy efficient lighting.

A questionnaire was administered online between September 26 to 29, 2011. A total of 1,004 residents of Nova Scotia completed the survey, drawn from an online panel owned by Research Now. Results were weighted by region and by whether or not the respondent owns or rents his/her home, with the results being weighted to match known population parameters.

A total of 50 in-home verification visits with survey respondents were conducted in October and November 2011. These visits entailed CRA staff gaining compliance from respondents to enter their households and count their light bulbs of various types. Respondents were given $50 as thanks for granting this compliance. Results from this component of the research are presented near the end of this report.

This report includes a detailed analysis of the data, a complete set of data tables, an executive summary, and a methodology section. All numbers are rounded to the nearest full number and, as such, may not always add up to 100 percent due to rounding. Where multiple responses are permitted, totals will exceed 100 percent.

Executive Summary

The results of the ***2011 Socket Study*** indicate that approximately one-half of all bulbs in Nova Scotia are energy efficient CFL or LED. Overall, residents of Nova Scotia report having an average of 26 permanent light fixture bulbs, 6 plug-in lamp bulbs, and 4 outdoor light bulbs. On average, residents have 19 energy efficient bulbs installed in their home (either CFL or LED). Residents report that their permanent light fixture bulbs and plug-in lamp bulbs are currently outfitted with a fairly even mix of regular bulbs (48% of permanent light fixture bulbs are regular bulbs and 50% of plug-in lamp bulbs are regular bulbs), and CFL bulbs (48% of permanent light fixture bulbs are CFL bulbs and 47% of plug-in lamp bulbs are CFL bulbs). LED bulbs are less than four percent of all permanent light fixture bulbs and plug-in lamp bulbs. In contrast, regular bulbs comprise approximately one-half of outdoor light bulbs, while four in ten outdoor light bulbs are CFL bulbs and one in ten are LED bulbs.

Use of energy efficient CFL or LED ***permanent light fixture bulbs*** is more prominent among residence owners, those who do not live in apartments, residents 35 years of age or older, households with annual incomes of $50K or more, and among residents who use home heating energy sources other than oil or electricity. Residents report having their permanent light fixture bulbs turned on for an average of 4.7 hours daily. The usage of energy efficient ***plug-in lamp bulbs*** is more commonplace in households of middle-aged Nova Scotia residents, and among those who heat their homes with alternative sources of energy (i.e., other than oil or electricity). Results indicate that residents use their plug-in lamp bulbs an average of 3.6 hours per day. LED bulbs are more common in ***outdoor light bulbs*** than in permanent light fixture bulbs or plug-in lamp bulbs. Such energy efficient outdoor light bulbs are more common on the properties of homeowners, women, and residents who heat their homes with alternative sources of energy. Nova Scotia residents report a large variation in the length of time that their outdoor light bulbs are turned on during a typical day. Overall, residents report turning on their outdoor light bulbs for an average of approximately four hours per day.

In order to assess their intentions to improve the energy efficiency of their homes, residents were asked to indicate whether behavioural statements applied to their household in terms of replacing non-efficient bulbs in the next year with energy efficient light bulbs. Overall, four in ten residents plan to ***replace at least one light fixture with a light fixture that is more energy efficient***. When asked about CFL light bulbs specifically, one-half indicate their intention to improve the efficiency of their light bulbs by ***replacing at least one regular bulb with a CFL light bulb***. However, when it comes to LED light bulbs, residents appear to be more uncertain than anything, as four in ten say that they *don't know* whether they will ***replace at least one regular bulb with a LED light bulb***.

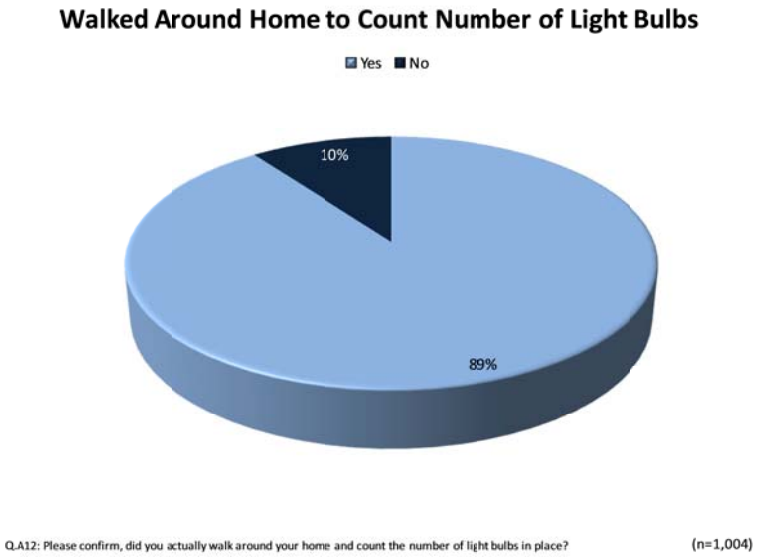
A verification component of the research indicated general concordance between the online survey results and those collected via the in-home verification visits, although there was a marked discrepancy in terms of the number of permanent regular light bulbs – the survey results being notably below those found via the in-home verification visits. A qualitative finding from the verification component of the study was that in many instances the use of energy efficient light bulbs was skewed towards high use light fixtures, lamps, or outdoor lights, that is, light bulbs that tend to be more heavily used.



Detailed Analysis

Data Collection Process

In completing this study, nine in ten residents (89%) indicate that they purposefully walked around their home to count the number of light bulbs in place, rather than make an educated guess.



Energy Efficiency

Approximately one-half of all bulbs in Nova Scotia are energy efficient CFL or LED. LED bulbs are the least common of all bulb types.

Overall, residents of Nova Scotia report having an average of 26 permanent light fixture bulbs, 6 plug-in lamp bulbs, and 4 outdoor light bulbs. Residents report that their permanent light fixture bulbs and plug-in lamp bulbs are currently outfitted with a fairly even mix of regular bulbs (48% of permanent light fixture bulbs are regular bulbs and 50% of plug-in lamp bulbs are regular bulbs) and CFL bulbs (48% of permanent light fixture bulbs are CFL bulbs and 47% of plug-in lamp bulbs are CFL bulbs), while LED bulbs are less than four percent of all permanent light fixture bulbs and plug-in lamp bulbs. In contrast, regular bulbs comprise approximately one-half of outdoor light bulbs (53%), while four in ten outdoor light bulbs are CFL bulbs (37%) and one in ten are LED bulbs (10%).

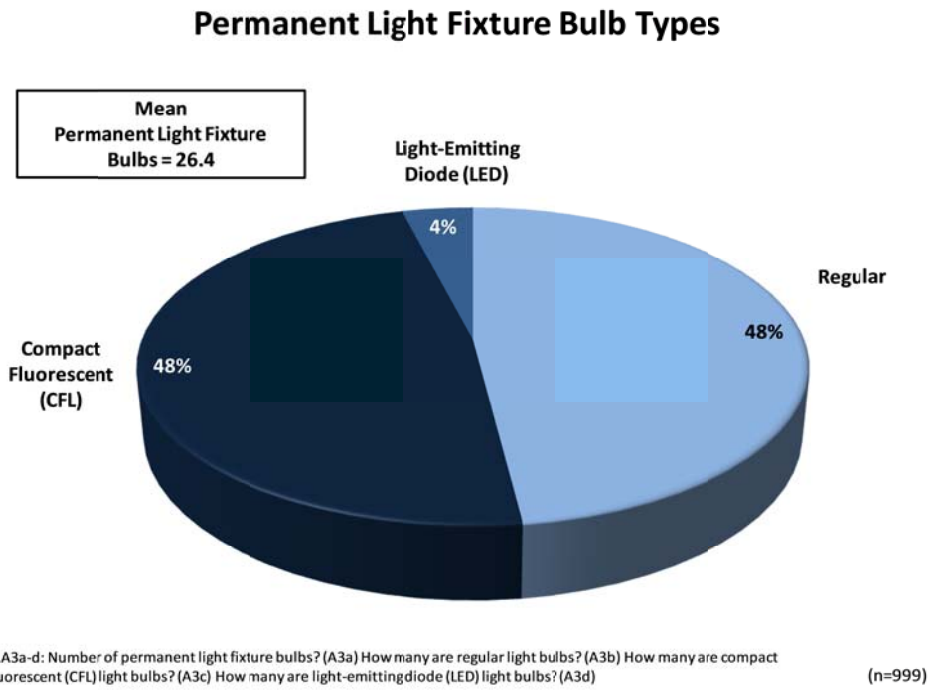
Number of bulbs found in ...*	Overall	Regular Bulbs	*Energy Efficient* CFL Bulbs	*Energy Efficient* LED Bulbs
Permanent Light Fixture Bulbs	**26**	13	12	1
Plug-in Lamp Bulbs	**6**	3	3	0
Outdoor Light Bulbs	**4**	2	1	1

**NOTE: Figures rounded to nearest whole number*

Energy Efficient Permanent Light Fixture Bulbs

Use of energy efficient CFL or LED permanent light fixture bulbs is more prominent among residence owners, Nova Scotians who do not live in apartments, residents 35 years of age or older, households with annual incomes of $50K or more, and among residents who use home heating energy sources other than oil or electricity.

As previously indicated, a relatively equal mix of regular and CFL bulbs is currently evident in permanent light fixtures, while LED light bulbs are considerably less popular. (Tables A3a-d)



In identifying the market penetration of energy efficient lighting in Nova Scotia, it is notable that the use of CFL bulbs is vastly more popular than the use of LED bulbs in permanent light fixtures. As previously mentioned, approximately one-half of permanent lighting bulbs are CFL (48%), while LED bulbs comprise a very small minority (4%). Energy efficient residents were identified as those most likely to use CFL bulbs in *most* of their permanent light fixture bulbs, and/or those most likely to use *any* LED bulbs. (This latter consideration regarding LED bulbs is due to the very small number of residents who utilize LED bulbs.) Those who meet this definition include residents who own their residence as opposed to rent, those who live in a single detached or duplex/townhouse dwelling, those between the ages of 35 and 54, those who heat their home with a source of energy other than electricity or oil (e.g., wood), and/or those from households with an annual household income of $50K or more.

The following table outlines the characteristics of residents who are most likely to utilize more of each specific type of light bulb in permanent light fixtures:

Permanent Light Fixture Bulbs

Light Bulb Type	Residents Most Likely to Use More
Regular bulbs (*over 50%* of permanent light fixture bulbs)	• Rent residence • Live in apartment • 55 years or older • Heat home with oil or electricity
CFL (*over 50%* of permanent light fixture bulbs)	• Own residence • 35-54 years old • Heat home with 'other' energy source (e.g., wood) • Household income level of $50K-$75K
LED (*at least one* permanent light fixture bulb)	• Own residence • Do not live in apartment • Household income level of more than $75K

CFL Bulb Use in Permanent Light Fixtures – Detailed Findings

Residents who are more likely to use CFL bulbs for more than one-half of their permanent light fixture bulbs include those who **own** their place of residence. However, it is notable that those who do not own their place of residence display a tendency to have either *all* of their permanent light fixture bulbs outfitted with CFL bulbs, or *none* of them. Although residents from households with a higher yearly income (more than $75K per year) are modestly more likely than lower-income residents (less than $50K per year) to have *at least one* CFL bulb among their permanent light fixture bulbs (92% compared to 85%), **middle income** households ($50K-$75K per year) are the most likely to have CFL bulbs in *all* of their permanent light fixture bulbs (17% compared to 7% among higher-income households and 13% in lower-income households). Those who utilize wood or energy sources other than electricity or oil to heat their homes are more likely to have CFLs as *at least half* their permanent light fixture bulbs (55% compared to 43% of those who use electricity and 44% of those who use oil).

LED Bulb Use in Permanent Light Fixtures – Detailed Findings

As LED usage in permanent light fixture bulbs is not common practice across Nova Scotia, CRA's analysis was based solely on whether or not respondents use *any* LED bulbs in their permanent light fixtures. To this end, residence **owners** (compared to renters) and **house dwellers** (compared to apartment dwellers) are more likely to use *at least one* LED bulb. In addition, residents with annual household incomes of more than $75K are the most likely to have *at least one* LED bulb (28%), compared to residents from less affluent households (17%).

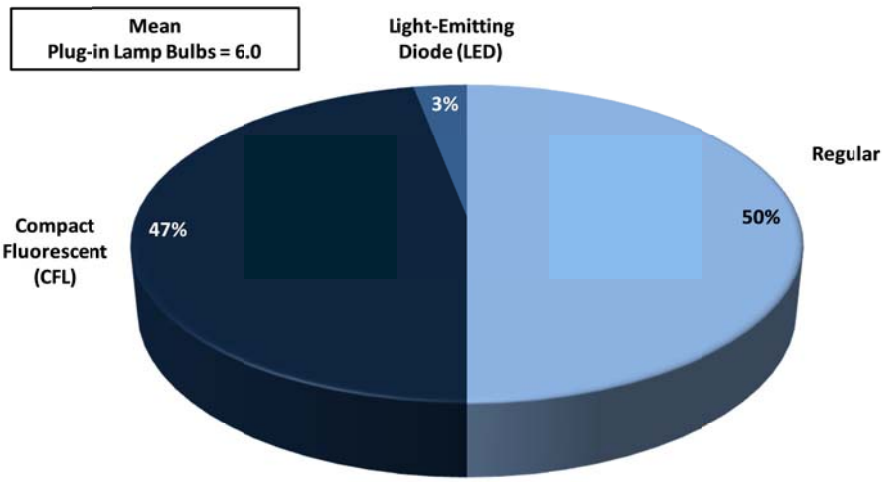


Energy Efficient Plug-in Lamp Bulbs

Plug-in lamp bulbs are less common than permanent light fixture bulbs. The usage of energy efficient bulbs is more commonplace in households of middle-aged residents, and among those who heat their homes with alternative sources of energy (i.e., other than oil or electricity).

Turning to the types of light bulbs found in plug-in lamps, as previously indicated, most plug-in lamp bulbs contain a fairly even mix of regular and CFL bulbs, while LED bulbs once again are not as popular. (Tables A6a-d)

Plug-in Lamp Bulb Types



Q.A6a-d: Number of plug-in lamp bulbs? (A6a) How many are regular light bulbs? (A6b) How many are compact fluorescent (CFL) light bulbs? (A6c) How many are light-emitting diode (LED) light bulbs? (A6d) (n=953)

The distribution of energy efficient bulbs in plug-in lamps is similar to that of energy efficient bulbs in permanent lighting fixture bulbs that was discussed above, as about one-half of plug-in lamp bulbs are CFL (47%), and considerably fewer are LED bulbs (3%). Generally speaking, those most likely to use energy efficient light bulbs (CFL and/or LED) as their plug-in lamp bulbs include residents between the ages of 35-54 years, and residents who heat their home via means other than oil or electricity, such as through wood.

The following table outlines the characteristics of residents who are most likely to use more of each specific type of plug-in lamp bulb:

Plug-in Lamp Bulbs

Light Bulb Type	Residents Most Likely to Use More
Regular bulbs (*over 50%* of plug-in lamp bulbs)	• Residents of Mainland Nova Scotia • Under the age of 35 • Heat home with oil or electricity
CFL (*over 50%* of plug-in lamp bulbs)	• Residents between 35-54 years old • Heat home with other energy source, (e.g., wood)
LED (*at least one* plug-in lamp bulb)	No population subgroup differences

CFL Bulb Use in Plug-in Lamps – Detailed Findings

Higher proportions of residents who use *at least one* CFL bulb can be found in **HRM** (73%) compared to the rest of the mainland (66%) and Cape Breton Island (59%). In fact, residents of Cape Breton are statistically less likely to use CFL bulbs as compared to residents from elsewhere in Nova Scotia. Interestingly, younger residents (aged 18-34) are less likely than older residents (aged 55 or older) to have *any* CFL plug-in lamp bulbs (38% have none, compared to 29% of residents 55 or older). **Middle-aged residents** (35-54 years of age) have a slightly higher average proportion of CFL plug-in lamp bulb usage (50%) as compared to their younger counterparts (42%). These middle-aged residents are also more likely to have CFLs for *all* their plug-in lamp bulbs (31%), as compared to older residents (21%). Finally, residents who use **alternative sources of energy** (such as wood) to heat their homes are more likely to have CFL plug-in lamp bulbs (55%), as compared to those who use oil (45%) or electricity (46%).

LED Bulb Use in Plug-in Lamps – Detailed Findings

Residents living in **duplex/townhouse**-style homes are more likely to have some LED plug-in lamp bulbs (12%), compared to those living in 'other' types of dwellings (0%) such as retirement homes or student dormitories. Apart from this small group difference, no other difference is evident across population subgroups in terms of LED Bulb Use in Plug-in Lamps.

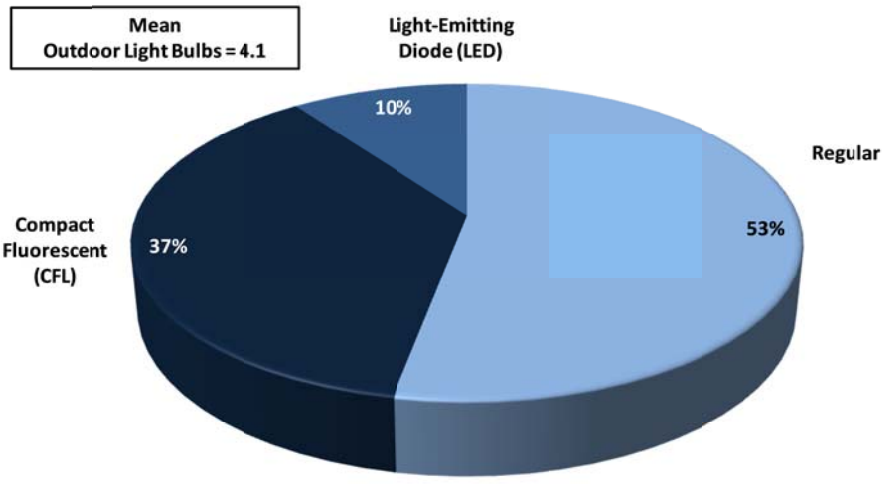


Energy Efficient Outdoor Light Bulbs

Approximately one-half of outdoor light bulbs are energy efficient CFLs or LEDs. Such energy efficient outdoor light bulbs are more common on the properties of homeowners, women, and residents who heat their homes with alternative sources of energy.

One-half of outdoor light bulbs are outfitted with regular bulbs (53%), with the other half being energy efficient bulbs. Four in ten outdoor light bulbs are CFL (37%) and one in ten are LED (10%). As such, LED bulbs are significantly more common in outdoor light bulbs than in permanent light fixture bulbs (4%) or plug-in lamp bulbs (3%). (Tables A9a-d)

Outdoor Light Bulb Types



Q.A9a-d: Number of outdoor light bulbs? (A9a) How many are regular light bulbs? (A9b) How many are compact fluorescent (CFL) light bulbs? (A9c) How many are light-emitting diode (LED)light bulbs? (A9d) (n=906)

Energy efficient light bulbs are used more commonly by residents who own their dwelling (instead of renting), and among Nova Scotians who use energy sources other than electricity or oil to heat their homes.

The following table outlines the characteristics of residents who are most likely to use more of each specific type of outdoor light bulb:

Outdoor Light Bulbs

Light Bulb Type	Residents Most Likely to Use More
Regular bulbs (***over 50%*** **of outdoor light bulbs)**	• Do not own residence • Use oil or electricity to heat home • Live in an apartment
CFL (***over 50%*** **of outdoor light bulbs)**	• Own residence • Use other energy sources (e.g., wood) to heat home
LED (***at least one*** **outdoor light bulb)**	• Own residence • Women • Part-time employment status

CFL Outdoor Light Bulb Usage – Detailed Findings

Those who **own** their residence are more likely to have *at least one* CFL outdoor light bulb (53%), as compared to those who are not homeowners (38%). Interestingly, **men** are more likely than women to have CFLs as *up to half* of their outdoor light bulbs (23% compared to 16%). **Older residents** (55+) are also more likely to have CFL bulbs as *up to half* of their outdoor light bulbs (23%), as compared to younger residents aged 18 to 34 (15%). Six in ten residents who heat their homes using **other energy sources** have *at least one* CFL outdoor light bulb (62%), compared to one-half of oil or electricity users (49%). Other energy source users are also more likely to have CFL bulbs as *more than half* of their outdoor light bulbs (11%), as compared to oil (6%) or electricity (5%) users. Residents living in **apartments** are likely to display a tendency to outfit "all or none" of their outdoor light bulbs with CFL bulbs, as the majority do not own *any* outdoor CFL bulbs (71%), but those who do have outfitted *all* their outdoor light bulbs with them (27%). Of note, the average number of outdoor light bulbs in apartments is less than one (0.8). Residents living in **detached** or **duplex** houses are more likely than those in apartments to have *at least one* CFL outdoor light bulb (54% and 50%, as compared to 29%). Similar to apartment dwellers, residents with lower household incomes (i.e., less than $50K per year) also display the tendency to outfit either *all* or *none* of their outdoor light bulbs with CFL bulbs, while residents from higher-income households (i.e., over $75K per year) tend to have a mix of CFL and regular bulbs.

LED Outdoor Light Bulb Usage – Detailed Findings

Residents who are more likely to have *at least one* LED outdoor light bulb include **homeowners** (17%) compared to those who do not own their residence (10%), **women** (19%) compared to men (12%), and residents with a **part-time** employment status (27%) compared to any other employment status (i.e., 13% of residents with full time employment and 17% of residents with other employment statuses).

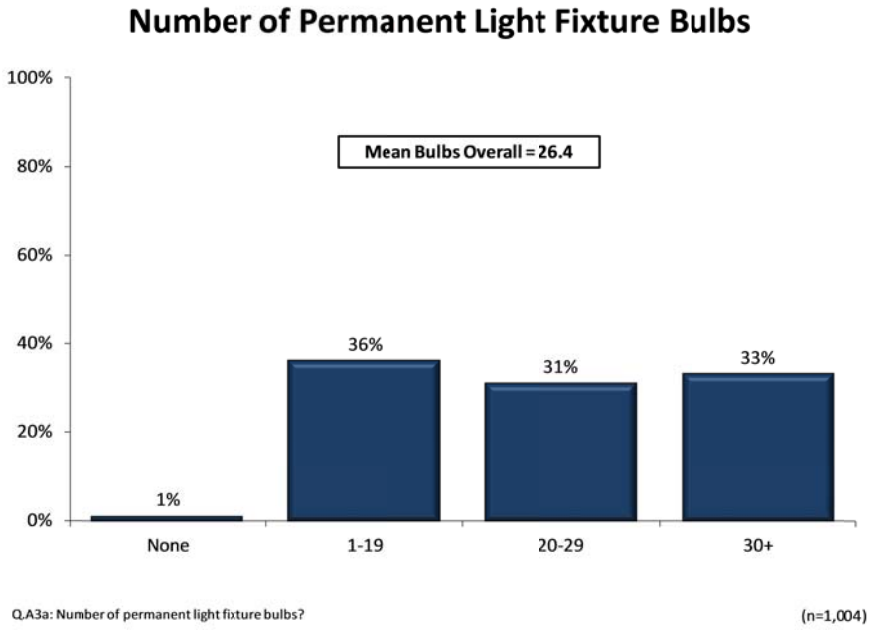


Light Bulb Count and Usage

Permanent Light Fixture Bulbs

Permanent light fixture bulbs are the most common across Nova Scotia, with slightly more than one-half being used on a typical day.

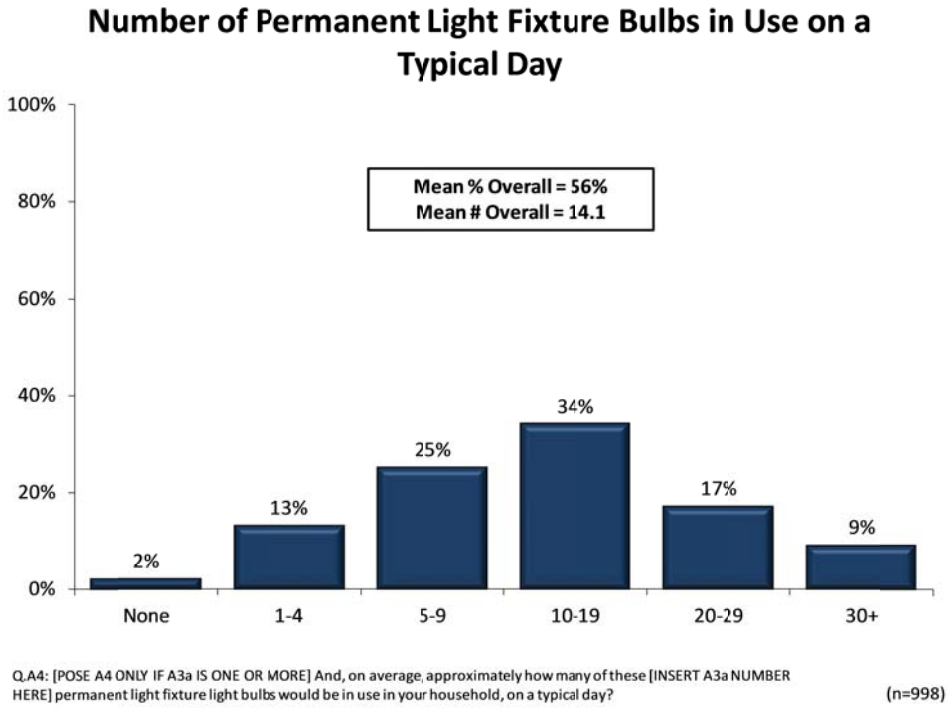
As noted above, Nova Scotia residents have an overall mean average of 26 permanent light fixture bulbs. Approximately four in ten residents have fewer than 20 permanent light fixture bulbs (37%), while three in ten have between 20 and 29 permanent light fixture bulbs (31%). One in three residents report owning 30 or more permanent light fixture bulbs (33%).



The incidence of permanent light fixture bulbs increases with age and yearly household income. As may be expected given that apartments often are comparatively smaller than houses, residents in apartments report having the lowest number of permanent light fixture bulbs (13), duplex/townhouse dwellers report having a number close to the overall average (23), and occupants of detached homes report having the highest number of permanent light fixture bulbs (30). (Table A3a)

Residents report using an average of 14 permanent light fixture bulbs on a typical day. This amounts to slightly more than one-half of their total permanent light fixture bulbs (56%) being typically used. Another helpful representation of permanent light fixture bulb use would be to examine the *proportion* of permanent light fixture bulbs used in relation to each resident's total number of permanent light fixture bulbs. Analysed from this perspective, one-half of residents indicate that on a typical day they use *less than half* of the permanent light fixture bulbs in their home (46%). Four in ten use *more than half, but not all* (41%), while one in ten residents indicate using *all* of the permanent light fixture bulbs in their home on a daily basis (12%).

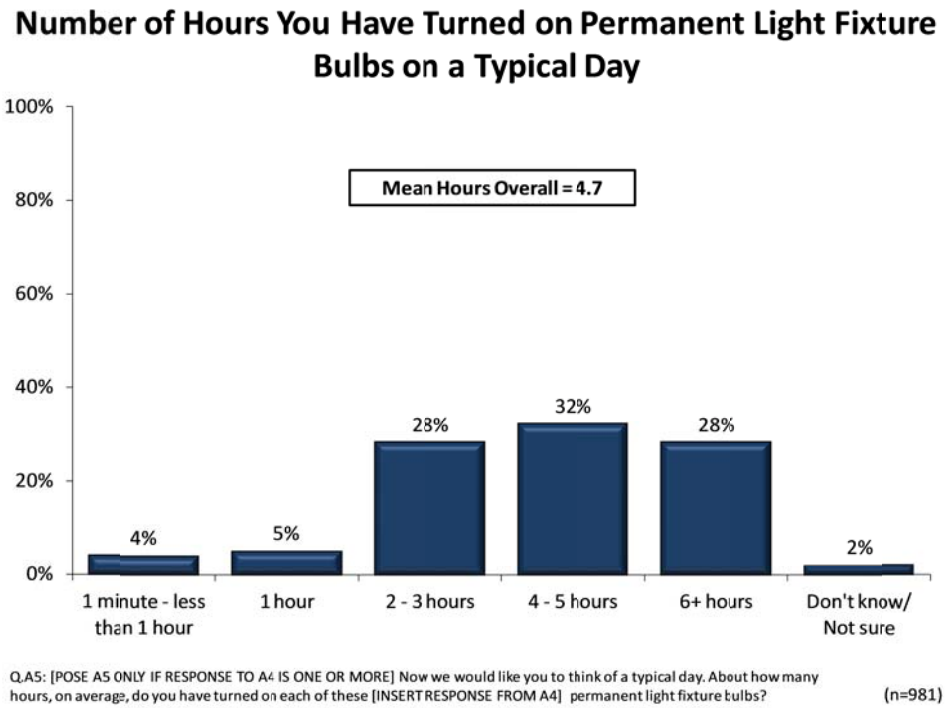
Still another manner of discussing the use of permanent light fixture bulbs on a typical day is presented in the following graph. This graphic displays the *number* of permanent light fixture bulbs in use on a typical day, as opposed to the previously-discussed *proportions*. (Table A4)



When considering the proportion of permanent light fixture bulbs used in a typical day relative to residents' total number of permanent light fixture bulbs, several differences across population subgroups are evident. Compared to residents who own their home, those who do not own their own home are more likely to use the majority of their permanent light fixture bulbs on a typical day. The number of permanent light fixture bulbs in use on a typical day decreases among older residents, and the likelihood of using *all* of one's permanent light fixture bulbs on a typical day is lower among higher household income Nova Scotians.

On average, residents report using their permanent light fixture bulbs for 4.7 hours on a typical day. Relatively equal groups of three in ten residents report turning on their permanent light fixture bulbs for two to three hours (28%), four to five hours (32%), or six hours or more (28%), while a combined one in ten residents use their permanent light fixture bulbs for one hour or less on a typical day (9%). (Table A5)



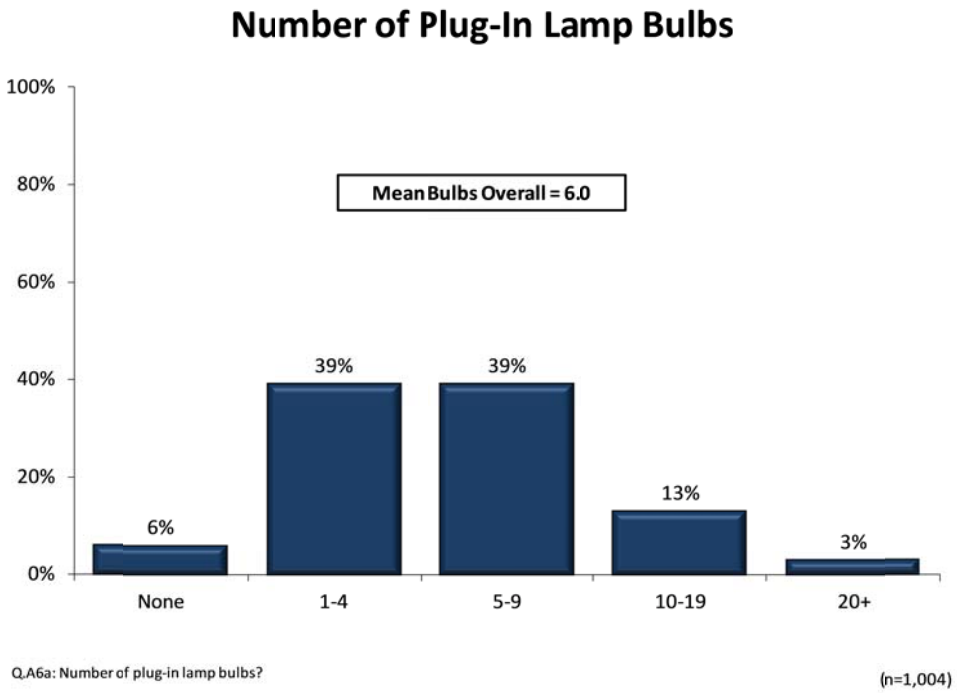


Although fewer permanent light fixture bulbs are present per capita among Cape Breton residents (22) as compared to HRM (27), it is noteworthy that these bulbs are used for almost one hour longer on average per day (i.e., 5.1 hours compared to 4.3 hours). Homeowners are less likely than those who do not own their place of residence to have their permanent light fixture bulbs turned on for six hours or more. Similarly, those residing in single, detached homes are less likely to have their permanent light fixture bulbs turned on for six hours or more as compared to apartment dwellers, while young residents (18-34) indicate that they are more likely than middle-aged residents (35-54) to have their permanent light fixture bulbs turned on for six hours or more. (Table A5)

Plug-in Lamp Bulbs

Although there are considerably fewer plug-in lamp bulbs as compared to permanent light fixture bulbs, usage of plug-in lamp bulbs on a typical day is similar to the permanent light fixture bulb use pattern.

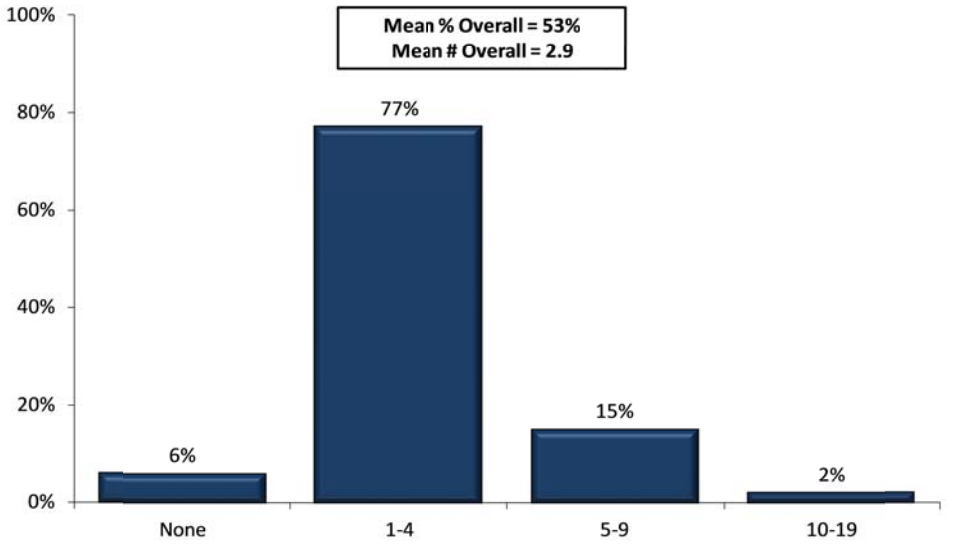
Across Nova Scotia, plug-in lamp bulbs are considerably less common as compared to permanent light fixture bulbs. As previously reported, residents have an average of six plug-in lamp bulbs. Slightly less than one-half of residents have fewer than five plug-in lamp bulbs (45%), while four in ten own between five and nine plug-in lamp bulbs (39%). Just under one in five residents report having ten or more plug-in lamp bulbs (16%).



The number of plug-in lamp bulbs in one's home increases with age, as older residents (55+) are three times more likely than younger residents (18-34), and twice as likely as middle-aged (35-54) residents, to have more than ten plug-in lamp bulbs. Interestingly, residents with full-time or part-time employment status are less likely to have more than ten plug-in lamp bulbs, as compared to those with some other employment status. Residents with full-time or part-time status have one fewer plug-in lamp bulb, on average, as compared to residents with some other employment status. (Table A6)

Given that the average resident owns six plug-in lamp bulbs, it is perhaps not surprising that the vast majority of respondents indicate that they use fewer than five plug-in lamp bulbs on a typical day (83%). Another helpful representation of the use of plug-in lamp bulbs would be to examine the *proportion* of plug-in lamp bulbs used in relation to each resident's total number of plug-in lamp bulbs. On average, residents use approximately one-half of their plug-in lamp bulbs on a typical day (53%). Six in ten indicate that they use *less than half,* or *none*, of their plug-in lamp bulbs on a typical day (58%), while close to one-quarter indicate that they use *more than half, but not all*, of their plug-in lamp bulbs (23%). An additional two in ten report that they use *all* their plug-in lamp bulbs on a typical day (19%). Still another manner of discussing the use of plug-in lamp bulbs on a typical day is presented in the following graph. This graphic displays the *number* of plug-in lamp bulbs in use on a typical day, as opposed to the previously-discussed *proportions*.

Number of Plug-In Lamp Bulbs in Use on a Typical Day

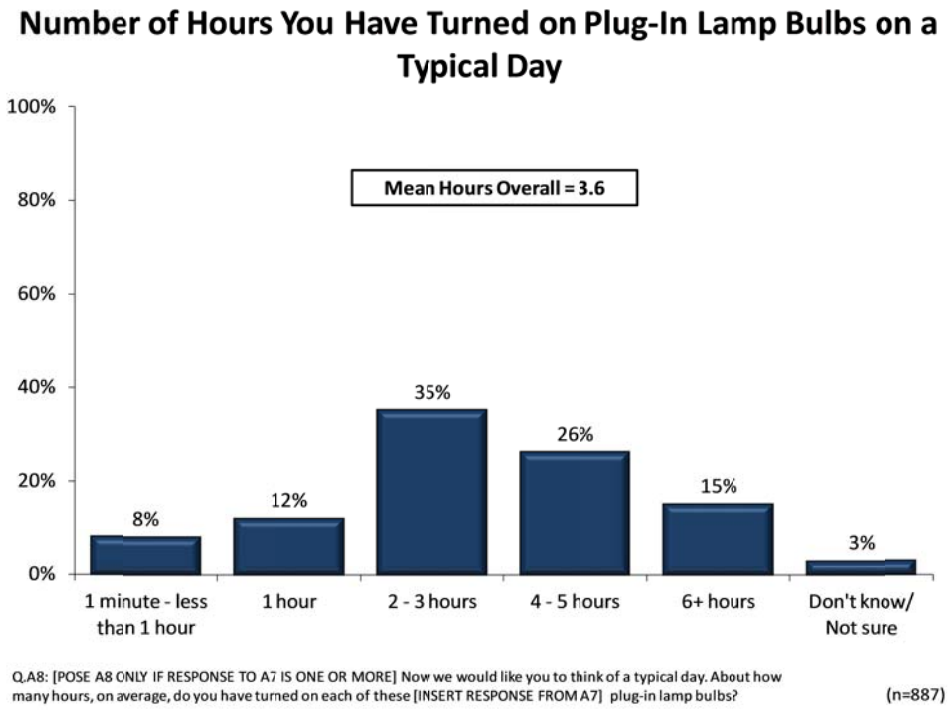


Q.A7: [POSE A7 ONLY IF A6a IS ONE OR MORE] And, on average, approximately how many of these [INSERT A5a NUMBER HERE] plug-in lamp bulbs would be in use in your household, on a typical day? (n=941)

Proportional differences in plug-in lamp bulb usage are evident across population subgroups. By region, residents of Cape Breton who have plug-in lamp bulbs are slightly more likely than HRM residents to use *none* of their plug-in lamp bulbs on a typical day (11% compared to 5%). Nova Scotians who do not own their own place of residence are twice as likely as residence owners to use *all* their plug-in lamp bulbs on a typical day (33% compared to 16%). Plug-in lamp bulb usage decreases noticeably as age increases, and also is lower among those with greater annual household incomes.

Residents use their plug-in lamp bulbs an average of 3.6 hours per day. Across Nova Scotia, on a typical day a small minority turn on their plug-in lamp bulbs either for less than one hour or not at all (8%), while one in ten say their plug-in lamp bulbs are turned on for about an hour (12%). More than one-third of residents have their plug-in lamp bulbs turned on for two to three hours on a typical day (35%), while one-quarter indicate that their plug-in lamp bulbs are on for four to five hours daily. A sizeable minority indicate that their plug-in lamp bulbs are used for six hours or more per day (15%).



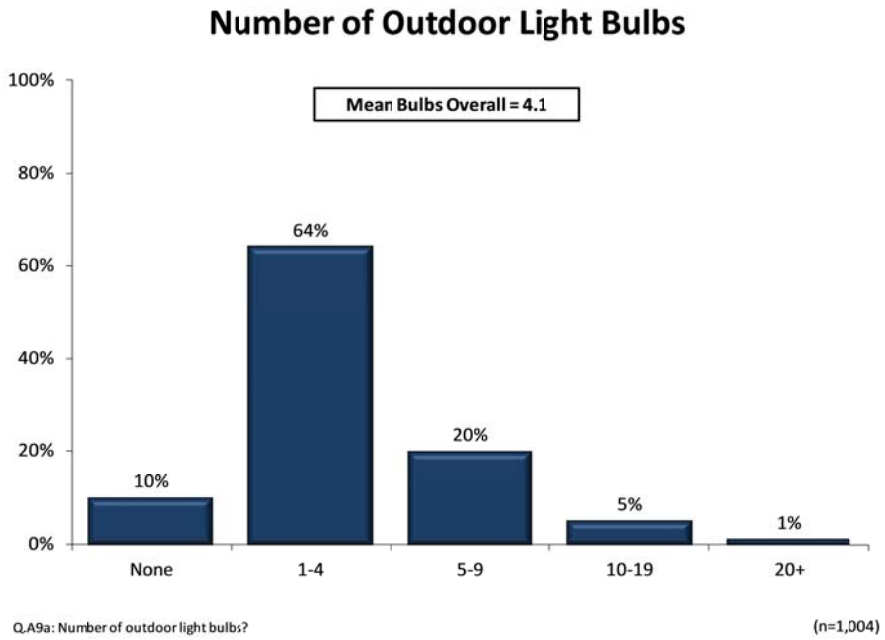


Among those most likely to have their plug-in lamp bulbs turned on for six hours or more are Cape Breton residents, Nova Scotians who do not own their residence, and residents with yearly household incomes of less than $50K (compared to those with household incomes of $50K to $75K). Residents 55 years or older are more likely than their younger counterparts to have their plug-in lamp bulbs turned on for more than four hours. (Table A8)

Outdoor Light Bulbs

Outdoor light bulbs are less common than permanent light bulbs and plug-in lamp bulbs.

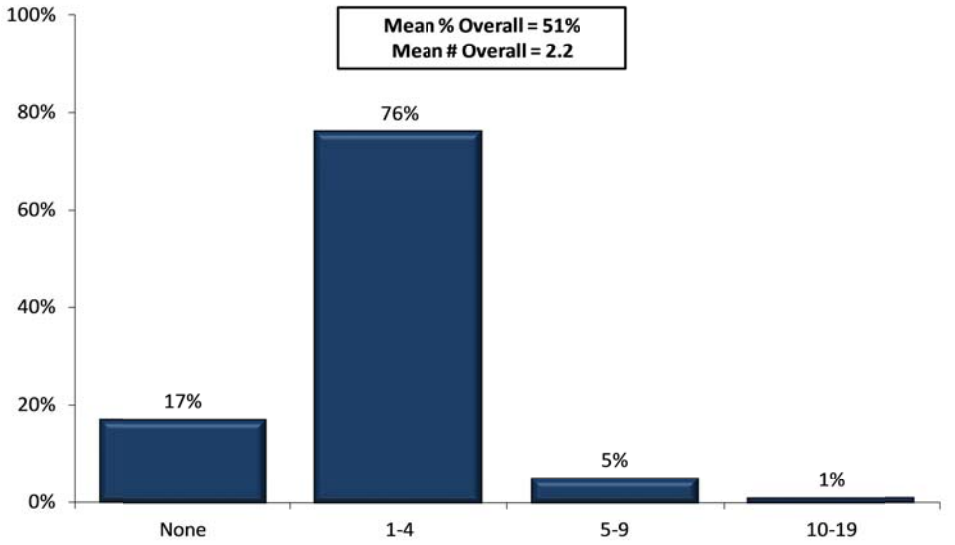
Nova Scotia residents own an average of only four outdoor light bulbs. Three-quarters of the population have fewer than five outdoor light bulbs (74%). Two in ten have five to nine outdoor light bulbs (20%), while a small minority have either 10 to 19 (5%) or 20 or more (1%) outdoor light bulbs. (Table A9a)



The quantity of outdoor light bulbs on one's property varies considerably according to different characteristics across the population. By region, residents on mainland Nova Scotia beyond HRM are slightly more likely (95%) than residents of HRM (86%) or Cape Breton (90%) to have *at least one* outdoor light bulb, although residents of both Cape Breton (70%) and the rest of mainland Nova Scotia (67%) are more likely than HRM residents (59%) to have between one and four outdoor light bulbs. Almost all homeowners (96%) have at least one outdoor light bulb, compared to only two-thirds of those who do not own their place of residence (66%). In fact, homeowners indicate owning an average of approximately three times as many outdoor light bulbs (4.8) as compared to non-homeowners (1.5). Similarly, one-half of apartment dwellers do *not* own an outdoor light bulbs at all (53%), compared to fewer than one in twenty residents who live in a detached home (3%) or a duplex/townhouse (4%). On average, residents of single, detached houses have the most outdoor light bulbs of any dwelling type (5.1), followed by residents of duplex/townhouse (2.5), and apartment dwellers, who own the least (0.8) Finally, the number of outdoor light bulbs tends to increase with yearly household income.

As the majority of residents own less than five outdoor light bulbs, it follows that the majority use less than five outdoor light bulbs (76%) on a typical day. Another helpful representation of outdoor light bulbs use would be to examine the proportion of outdoor light bulbs used in relation to each resident's total number of outdoor light bulbs. On average, residents use one-half of the outdoor light bulbs on their property on a typical day (51%). As slightly less than one-half of residents use *less than half* (but at least one) of their outdoor light bulbs (46%), and two in ten indicate using *none* of their outdoor light bulbs (17%) despite having at least one, the majority of residents use *less than half* of the outdoor light bulbs on their property on a typical day. One-quarter use *all* of their outdoor light bulbs (25%), while an additional one in ten use *more than half* (but not all) of their outdoor light bulbs (12%). The following graph displays the *number* of outdoor light bulbs in use on a typical day, as opposed to the previously-discussed *proportions*. (Table A10)

Number of Outdoor Light Bulbs in Use on a Typical Day

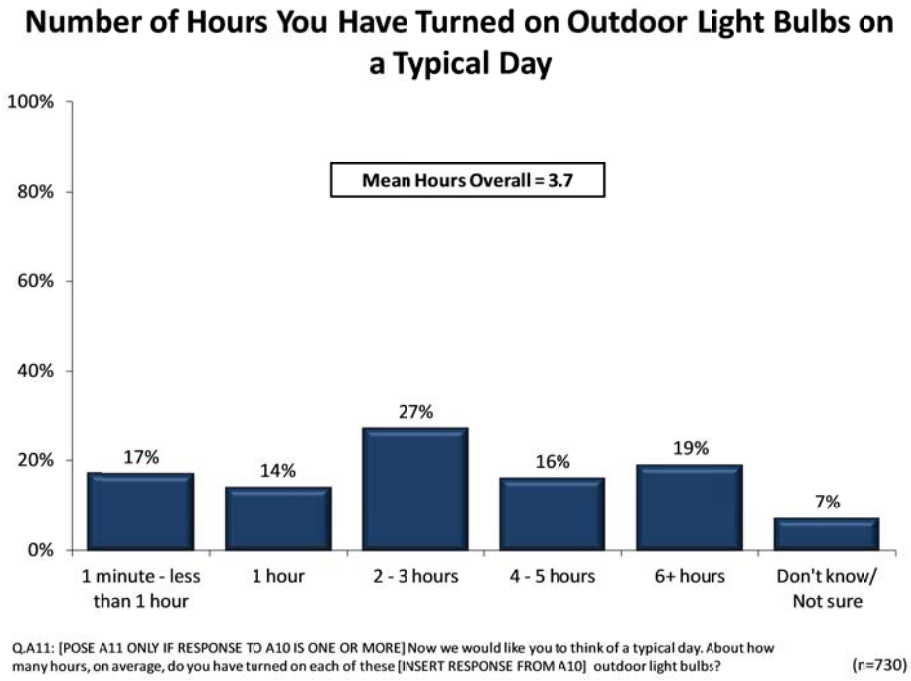


Q.A10: [POSE A10 ONLY IF A9a IS ONE OR MORE] And, on average, approximately how many of these [INSERT A9a NUMBER HERE] outdoor light bulbs would be in use in your household, on a typical day? (n=893)

Outdoor light bulb usage also varies across several demographic characteristics. Residents of Cape Breton are more likely to use the *all* of their outdoor light bulbs on a daily basis compared to the rest of Nova Scotia, while HRM residents are more likely than Cape Breton residents to use *none* of their outdoor light bulbs. Compared to homeowners, Nova Scotians who do not own their residence show a stronger tendency to use either *all* (45% compared to 21%) or *none* (27% compared to 15%) of their outdoor light bulbs on a daily basis. A similar finding is observed among those who reside in apartments, who are about twice as likely to show an "*all* or *nothing*" pattern of usage of outdoor light bulbs compared to those residing in single, detached houses or duplex/townhouses. Usage of outdoor light bulbs appears to decrease with respondent age. Further, residents who use electricity to heat their home are modestly less likely than those who use oil or other sources of energy to use *any* of their outdoor light bulbs on a typical day (79% compared to 85%).

Residents report a large variation in the length of time that their outdoor light bulbs are turned on during a typical day. Overall, residents report turning on their outdoor light bulbs for an average of approximately four hours per day. One in five report leaving outdoor light bulbs on for six hours or more (19%), while less than two in ten use their outdoor light bulbs for four to five hours on a typical day (16%). Three in ten indicate they use these lights for two to three hours (27%), and slightly more than one in ten indicate that they typically use their outdoor light bulbs for one hour (14%). Two in ten residents report using their outdoor light bulbs for less than one hour on a typical day (17%). (Table A11)



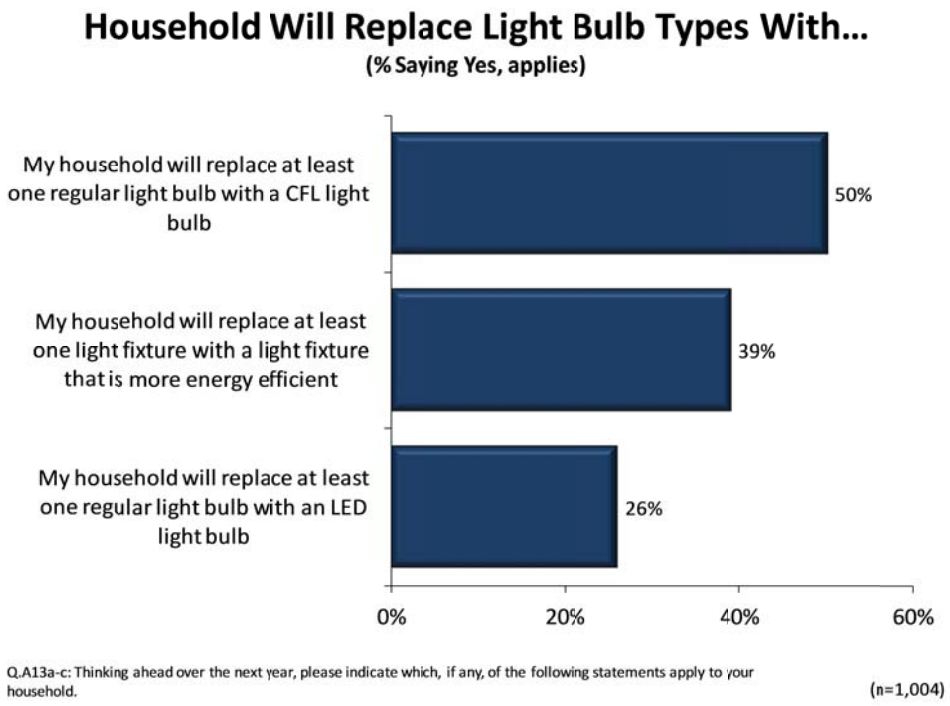


Across the population, residents in Cape Breton turn on their outdoor light bulbs for approximately one hour longer (4.8 hours) as compared to HRM residents (3.7 hours) and those elsewhere on mainland Nova Scotia (3.5 hours). There is a difference in the average length of time that younger residents aged 18 to 34 leave their outdoor light bulbs on (4.2 hours), as compared to older residents aged 55 years or over (3.1 hours). Older residents are less likely than younger residents to leave their outdoor light bulbs on for six hours or more.

Intentions to Implement Energy Efficient Light Bulbs

Up to one-half of residents intend to replace non-efficient bulbs in the next year with energy efficient light bulbs.

In order to assess their intentions to improve the energy efficiency of their homes, residents were asked to indicate whether behavioural statements applied to their household in terms of replacing non-efficient bulbs in the next year with energy efficient light bulbs. Overall, four in ten residents plan to **replace at least one light fixture with a light fixture that is more energy efficient** (39%). Of note, one-third of residents answered that they are unsure whether they would do so (34%), while three in ten said that they would not (27%). Interestingly, when asked about CFL light bulbs specifically, significantly more residents indicate their intention to improve the efficiency of their light bulbs by **replacing at least one regular bulb with a CFL light bulb** (50%). Another three in ten indicate that they are unsure (29%), while only two in ten say that they will not do so (21%). However, when it comes to LED light bulbs, residents appear to be more uncertain than anything, as four in ten say that they **don't know** whether they will **replace at least one regular bulb with a LED light bulb** (44%). One-quarter claim that they will do so (26%), while three in ten say that they will not (30%). (Tables A13a-c)



In terms of replacing one light fixture with one that is more energy efficient, the only population difference that emerged was for residents who heat their home with oil (36%). These residents are less likely than those who heat their homes with electricity (44%) to indicate that they will replace at least one light fixture with one that is more energy efficient. As previously reported, residences heated with alternative sources of energy, including wood, are more likely to have higher proportions of CFL bulbs as compared to residences heated with oil or electricity. Thus from one perspective, residents who heat their homes with alternative sources of energy are at the forefront of energy efficiency.

Turning to CFL bulbs specifically, **residence owners** are more likely than non-owners to indicate that they intend over the next year to replace at least one regular bulb with a CFL bulb (52% compared to 43%). This is interesting given that (as previously reported) residence owners are already more likely to have higher proportions of CFL bulbs than non-owners in their permanent light fixture bulbs as well as in their outdoor lights. Similarly, apartment dwellers are less likely (39%) than those living in **single, detached** houses (53%) or **duplexes/ townhouses** (53%) to indicate that they intend over the next year to replace at least one regular bulb with a CFL bulb. Residents from households with **higher annual household incomes** (over $75K) are more likely than those from households with lower incomes (less than $50K) to state their intention to replace at least one regular bulb with a CFL bulb in the next year.

In-Home Verification Visits

As mentioned in the Introduction, a total of 50 in-home verification visits were made among survey respondents, to count the actual number of bulbs within surveyed households. A comparison of survey versus verification visit results is presented in this section of the report. A key overall finding, as evident in the table immediately below, is that survey respondents notably understated on their survey questionnaire responses the number of regular light bulbs in permanent light fixtures in their households. Survey responses very closely match the verification visit results in terms of CFL bulbs, and the results between the two groups are relatively close in terms of LED bulbs.

Panel vs. Site Visit Analysis

	CFL			Regular			LED		
	Panel Survey	Site Visit	Diff-erence	Panel Survey	Site Visit	Diff-erence	Panel Survey	Site Visit	Diff-erence
Permanent	14.3	14.8	↑0.5	13.2	24.1	↑10.9	1.5	.3	↓1.2
Plug-in	3.7	3.8	↑0.1	2.6	4.8	↑2.2	.3	.4	↑.1
Outdoor	1.6	1.5	↓0.1	2.2	4.4	↑2.2	.5	.1	↓.4

CFLs

Mean scores suggest that panel members accurately count the number of CFL bulbs in their home. That said, 34 percent underestimated their number of permanent CFL bulbs by at least three bulbs, and 23 percent overestimated by the same amount. The majority of residents correctly estimates their number of outdoor or plug in CFL bulbs.

Estimate of number of light bulbs	Permanent CFL	Plug-In CFL	Outdoor CFL
Underestimated by 11+	7%	2%	n/a
Underestimated by 3-10	27%	17%	9%
Correctly estimated within 2	**43%**	**67%**	**82%**
Overestimated by 3-10	19%	9%	8%
Overestimated by 11+	4%	5%	n/a

Regular Light Bulbs

The majority of residents underestimate the number of regular permanent light bulbs in their home (72%). Four in ten underestimate the number of plug-in regular light bulbs (39%), while the majority correctly estimates the number of regular outdoor light bulbs (78%).



Estimate of number of light bulbs	Permanent Regular	Plug-In Regular	Outdoor Regular
Underestimated by 11+	43%	2%	8%
Underestimated by 3-10	29%	37%	5%
Correctly estimated within 2	**17%**	**50%**	**78%**
Overestimated by 3-10	7%	8%	9%
Overestimated by 11+	2%	2%	n/a

LED Bulbs

Residents are generally correct when estimating the number of LED bulbs in their home, with at least three-quarters of residents correctly estimating their permanent, plug-in and outdoor LED light bulbs.

Estimate of number of light bulbs	Permanent LED	Plug-In LED	Outdoor LED
Underestimated by 11+	n/a	n/a	n/a
Underestimated by 3-10	6%	7%	2%
Correctly estimated within 2	**77%**	**91%**	**91%**
Overestimated by 3-10	14%	2%	6%
Overestimated by 11+	2%	n/a	n/a



Study Methodology

Questionnaire Design and Survey Administration

The questionnaire used for this study was designed by CRA, in consultation with Efficiency Nova Scotia staff members. Prior to being finalized, the survey was pre-tested on a small number of respondents to ensure the appropriateness of the questions and response categories.

This survey of a general public online panel was conducted using an online panel from September 26 to 29, 2011, with adult residents in Nova Scotia aged 18 or older.

The survey was programmed by Nooro Online Research, and the general public panel members utilized for sampling purposes were drawn from an online panel owned by Research Now. CRA on many occasions has successfully called upon the professional services of Nooro Online Research as well as Research Now.

The total number of completed surveys for the present study was 1,004.

The survey required an average of just over 9 minutes to complete.

A total of 50 in-home verification visits with survey respondents were conducted in October and November 2011 (Christmas lights were recorded, but not included in the final tabulated results). These visits entailed CRA staff gaining compliance from respondents to enter their households and count their light bulbs of various types. Respondents were given $50 as thanks for granting this compliance. The visits occurred across the province, with a distribution as follows:

- Halifax Regional Municipality: 23 visits
- South Shore: 4 visits
- Annapolis Valley: 9 visits
- Northern NS: 7 visits
- Cape Breton Island: 7 visits

The collected data from the verification process was weighted to match the actual distribution of residents within Nova Scotia.

2016 Socket Study

Final Report

Reproduction in whole or in part is not permitted without the express permission of
Efficiency Nova Scotia
ENS001-1055

Prepared for:

efficiency NOVA SCOTIA™

December 2016

CRA CORPORATE RESEARCH ASSOCIATES

www.cra.ca
1-888-414-1336

Marketing Research and Intelligence Association · L'Association de la Recherche et de l'Intelligence Marketing
Accredited Gold Seal Corporate Member
MRIA AIRM

Table of Contents

Page

Introduction 1

Executive Summary 2

Detailed Analysis 4

- Data Collection Process 4
- Energy Efficiency 4
- Energy Efficient Permanent Light Fixture Bulbs 6
- Energy Efficient Plug-in Lamp Bulbs 7
- Energy Efficient Outdoor Light Bulbs 9
- Light Bulb Count and Usage 10
- Intentions to Implement Energy Efficient Light Bulbs 19
- In-Home Verification Visits 20

Study Methodology 22

Appendices:

- A – Study Questionnaire
- B – Tabular Results

Introduction

This report presents the results of the ***2016 Socket Study*** conducted by Corporate Research Associates Inc. on behalf of Efficiency Nova Scotia. The overall goal of this study was to determine market penetration of energy efficient lighting (CFL, LED and Halogen bulbs), and to identify the degree of market transformation that has taken place in the efficiency sector. More specifically, this study sought to:

- *Provide information on the type of bulbs present in each socket on the respondent's property;*
- *Estimate the number of hours of use of each type of lighting; and*
- *Probe intentions to implement energy efficient lighting.*

A questionnaire was administered online between November 17 and 29, 2016. A total of 1,008 residents of Nova Scotia completed the survey, drawn from the Logit Group (formerly Cido Research) online panel. Results were weighted by region and by whether or not the respondent owns or rents his/her home, with the results being weighted to match known population parameters.

A total of 50 in-home verification visits with survey respondents were conducted from November 25 to December 8, 2016. These visits entailed CRA staff gaining compliance from a sampling of the online survey respondents to enter their households and count their light bulbs of various types. Respondents were given $50 as thanks for granting this compliance. Results from this component of the research are presented near the end of this report.

This report includes a detailed analysis of the data, a complete set of data tables, an executive summary, and a methodology section. All numbers are rounded to the nearest full number and, as such, may not always add up to 100 percent due to rounding. Where multiple responses are permitted, totals will exceed 100 percent.

© Corporate Research Associates Inc., 2016

Executive Summary

The results of the ***2016 Socket Study*** indicate that approximately three-quarters of all bulbs are energy efficient CFL, LED or Halogen bulbs, up from approximately one-half five years ago. Overall, residents of Nova Scotia in 2016 report having an average of 30 permanent light fixture bulbs, 8 plug-in lamp bulbs, and 5 outdoor light bulbs. In 2011 these figures stood at 26 permanent light fixture bulbs, 6 plug-in lamp bulbs, and 4 outdoor light bulbs (i.e., an average of an additional 7 bulbs per household). While one might initially infer from this data that the absolute number of bulbs reported in Nova Scotia households has increased over the past five years, the in-home, in-person verification visits conducted after the online survey research did not find evidence to support such a conclusion.

As compared to 2011, there has been change in terms of the mix of the various types of bulbs in NS homes. Whereas approximately 30 percent of all permanent light fixture bulbs are now regular incandescent light bulbs, this figure stood at approximately one-half (48%) in 2011. Likewise, whereas five years ago 50 percent of plug-in lamp bulbs were regular bulbs, today that figure stands at only 33 percent. In terms of CFL bulbs, whereas in 2011 48 percent of permanent light fixture bulbs were CFL bulbs, today that figure stands at only 42 percent. Likewise, whereas five years ago 47 percent of plug-in lamp bulbs were CFL bulbs, this year that figure has declined to 42 percent. As well, whereas five years ago LED bulbs were less than four percent of all permanent light fixture bulbs and plug-in lamp bulbs, this year LED bulbs comprise 24 percent and 21 percent, respectively. Whereas five years ago Halogen bulbs had essentially no presence in NS homes, this year 6 percent of all permanent light fixture bulbs are Halogen bulbs, and 5 percent of all plug-in light bulbs are Halogen. Finally, in 2016 regular incandescent bulbs comprise only 33 percent of outdoor light bulbs (as compared to 53% in 2011), while one in three outdoor light bulbs are CFL bulbs (35%, as compared to 37% in 2011), almost one in four are LED bulbs (23%, up from 10% in 2011), and 9 percent are Halogen bulbs (as compared to 0%).

Use of at least one energy efficient LED or Halogen permanent light fixture bulb in 2016 is more prominent among Nova Scotians who own and do not rent their home, among older residents, and among those with high household incomes. The presence of CFL bulbs does not differ along these lines. Also noteworthy is that whereas in 2011 only 11 percent of Nova Scotia households with permanent light fixtures had no regular incandescent light bulbs, in 2016 this figure has risen notably to 28 percent.

Permanent light fixture bulbs remain by far the most common across Nova Scotia, with slightly more than one-half being used on a typical day. On average, residents this year report using their permanent light fixture bulbs for 4.7 hours on a typical day, exactly the same as in 2011. Although slightly fewer permanent light fixture bulbs are present per capita among Cape Breton (29.1) and Rest of Mainland (29.8) residents as compared to HRM (31.5), these bulbs are used slightly longer on average per day in Cape Breton (5.0 hours), as compared to 4.7 hours in each of HRM and elsewhere on the mainland.

Plug-in lamp bulbs remain considerably less common than permanent light fixture bulbs. As with permanent light fixture bulbs, use of at least one energy efficient LED or Halogen plug-in lamp bulb in 2016 is more prominent among Nova Scotians who own and do not rent their home, and among those with higher household incomes.

© Corporate Research Associates Inc., 2016

The percentage usage of plug-in lamp bulbs on a typical day is similar to the permanent light fixture bulb use. Given that the average resident owns approximately eight plug-in lamp bulbs, it is perhaps not surprising that a strong majority of respondents indicate in 2016 that they use fewer than five plug-in lamp bulbs on a typical day (75%), with the mean average being 3.4 bulbs. Residents use their plug-in lamp bulbs an average of 4.0 hours per day (up from 3.6 in 2011).

Outdoor light bulbs remain less common than permanent light bulbs and plug-in lamp bulbs. As per the online survey research results, Nova Scotia residents own an average of only approximately five outdoor light bulbs (4.7), up from approximately four in 2011 (4.1). Two-thirds of the population have fewer than five outdoor light bulbs (67%, as compared to 74% in 2011). As the majority of residents own less than five outdoor light bulbs, it follows that the majority use less than five outdoor light bulbs (87%, as compared to 93% in 2011) on a typical day (an average of 2.2 are used in a typical day, unchanged since 2011). Residents report a large variation in the length of time that their outdoor light bulbs are turned on during a typical day.

Three-quarters of residents intend to replace less-efficient bulbs in the next year with (more) energy efficient light bulbs. When those with at least one regular incandescent light bulb were asked about CFL light bulbs specifically, a sizeable minority of residents indicate their intention to improve the efficiency of their light bulbs by replacing at least one regular bulb with a CFL light bulb (39%). In terms of LED light bulbs, another sizeable minority of residents with at least one regular bulb in their home indicate their intention to improve the efficiency of their light bulbs by replacing at least one regular bulb with an LED light bulb (40%). In terms of Halogen light bulbs, a smaller minority of residents with at least one regular bulb indicate their intention to improve the efficiency of their light bulbs by replacing at least one regular bulb with a Halogen light bulb (17%). Finally, a sizeable minority of residents with at least one CFL bulb indicate their intention to improve the efficiency of their light bulbs by replacing at least one CFL bulb with an LED light bulb (40%).

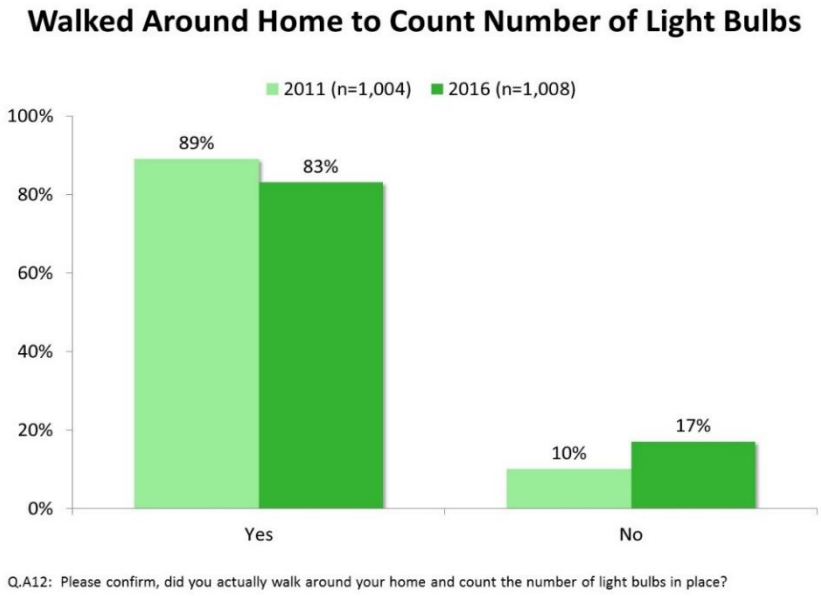
A verification component of the research indicated a stronger concordance than in 2011 between the 2016 online survey results, and those collected in 2016 via the in-home verification visits.

© Corporate Research Associates Inc., 2016

Detailed Analysis

Data Collection Process

In completing this study, just over eight in ten residents (83%) indicate that they purposefully walked around their home to count the number of light bulbs in place, rather than have made an educated guess. (Table A12)



Q.A12: Please confirm, did you actually walk around your home and count the number of light bulbs in place?

Energy Efficiency

While the online research results suggest that the absolute number of bulbs reported in Nova Scotia households has increased by just under 20 percent over the past five years, the in-home verification visits (discussed later in this report) do not provide supportive evidence. Among all bulbs, approximately three-quarters of all bulbs are energy efficient CFL, LED or Halogen bulbs, up from approximately one-half five years ago.

Overall, residents of Nova Scotia in 2016 report having an average of 30 permanent light fixture bulbs, 8 plug-in lamp bulbs, and 5 outdoor light bulbs. In 2011 these figures stood at 26 permanent light fixture bulbs, 6 plug-in lamp bulbs, and 4 outdoor light bulbs, thus representing (based on the online research findings) a net increase in the absolute number of bulbs in a household of just below 20 percent over the past five years (i.e., an average of an additional 7 bulbs per household).

*Number of Bulbs**	Overall		Regular Bulbs		*Energy Efficient*					
					CFL Bulbs		LED Bulbs		Halogen	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Permanent light fixture bulbs	26	**30**	13	**8**	12	**12**	1	**9**	n/a	**2**
Plug-in lamp bulbs	6	**8**	3	**2**	3	**3**	0	**2**	n/a	**1**
Outdoor light bulbs	4	**5**	2	**1**	1	**2**	1	**1**	n/a	**1**

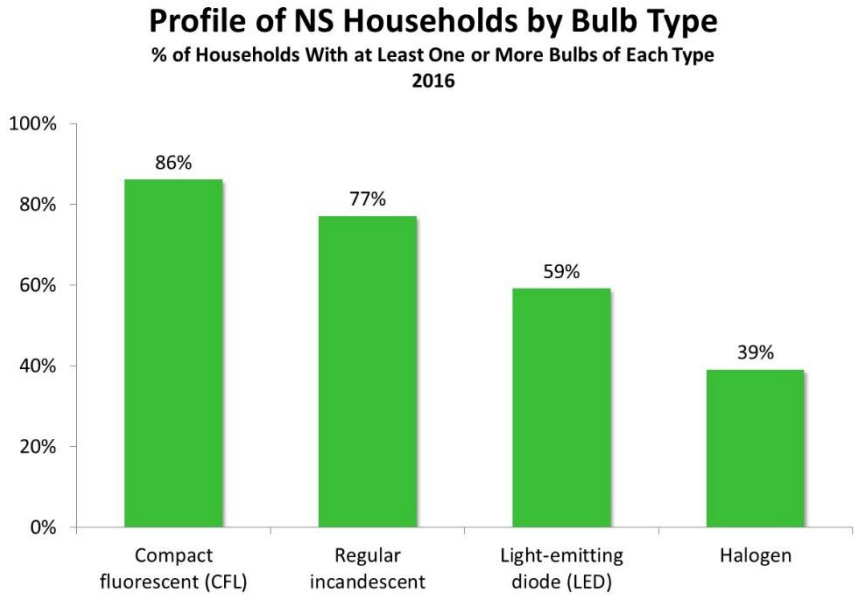
**NOTE: Figures rounded to nearest whole number, and are derived from a base of all Nova Scotia households.*

© Corporate Research Associates Inc., 2016

Please note, most data presented in this report is derived from computations of households that have one or more of the types of light bulb under discussion. For example, as distinct from the table presented immediately above that is based on all Nova Scotian households, the discussion in the following paragraph is based upon tabulations entailing only those households that have outdoor light bulbs, plug-in lamps, and so forth.

As compared to 2011, there has been a change in terms of the mix of the various types of bulbs in NS homes. Whereas approximately 30 percent of all permanent light fixture bulbs are now regular incandescent light bulbs, this figure stood at approximately one-half (48%) in 2011. Likewise, whereas five years ago 50 percent of plug-in lamp bulbs were regular bulbs, today that figure stands at only 33 percent. In terms of CFL bulbs, whereas in 2011 48 percent of permanent light fixture bulbs were CFL bulbs, today that figure stands at only 42 percent. Likewise, whereas five years ago 47 percent of plug-in lamp bulbs were CFL bulbs, this year that figure has declined to 42 percent. The current results clearly indicate, however, that the mix of energy efficient bulbs is in a state of transition in the province. Specifically, whereas five years ago LED bulbs were less than four percent of all permanent light fixture bulbs and plug-in lamp bulbs, this year LED bulbs comprise 24 percent and 21 percent, respectively. The current research also catalogues the ascendance of Halogen bulbs in the Nova Scotia marketplace. Whereas five years ago this type of bulb had essentially no presence in NS homes, this year 6 percent of all permanent light fixture bulbs are Halogen bulbs, and 5 percent of all plug-in light bulbs are Halogen bulbs. In contrast, in 2016 regular incandescent bulbs comprise only 33 percent of outdoor light bulbs (as compared to 53% in 2011), while one in three outdoor light bulbs are CFL bulbs (35%, as compared to 37% in 2011), one in four are LED bulbs (23%, up from 10% in 2011), and 9 percent are Halogen bulbs (as compared to 0% five years ago).

It is noteworthy that the incidence of households with at least one CFL bulb is now above the incidence of households with at least one regular incandescent bulb (conversely, 23% of NS households have no regular incandescent bulbs, as displayed in the graph below.



Q.A3/A6/A9: Number of bulbs. (n=1,008)

© Corporate Research Associates Inc., 2016

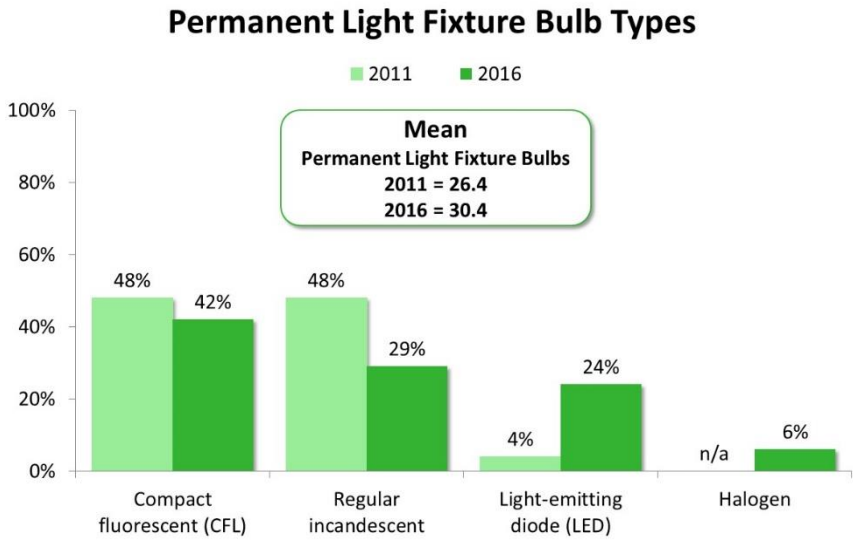
Energy Efficient Permanent Light Fixture Bulbs

The percentage of NS households with no regular incandescent lights has more than doubled since 2011.

Use of at least one energy efficient LED or Halogen permanent light fixture bulb in 2016 is more prominent among Nova Scotians who own and do not rent their home, among older residents, and among those with high household incomes. The presence of CFL bulbs does not differ along these lines.

Also noteworthy is that whereas in 2011 only 11 percent of Nova Scotia households with permanent light fixtures had no regular incandescent light bulbs, in 2016 this figure has risen notably to 28 percent.

As previously indicated, the relative mix of energy efficient bulbs in the Nova Scotia marketplace is quite different than five years ago. (Tables A3a-e)



Q.A3a-e: a) Number of permanent light fixture bulbs? (2011: n=1,004; 2016: n=1,008) b) How many are regular incandescent light bulbs? (2011: n=998; 2016: n=1,005) c) How many are halogen light bulbs? (2016: n=1,005) d) How many are compact fluorescent (CFL) light bulbs? (2011: n=998; 2016: n=1,005) e) How many are light-emitting diode (LED) light bulbs? (2011: n=998; 2016: n=1,005)

In identifying the market penetration of energy efficient lighting in Nova Scotia, it is notable that the use of CFL bulbs remains more popular than the use of LED or Halogen bulbs in permanent light fixtures, but its market share is diminishing. As previously mentioned, approximately four in ten permanent lighting bulbs this year are CFL (42%), while LED bulbs comprise a growing minority (24%). Halogen bulbs have started to appear in Nova Scotia homes (6% this year). Whereas 51 percent of all rental household bulbs are CFL, only 39 percent of the bulbs in an owned dwelling are CFL bulbs. It also is notable that those who do not own their place of residence display a tendency more so than home owners to have *all* of their permanent light fixture bulbs outfitted with CFL bulbs (19% as compared to 5%). A modestly greater percentage of residents from lower household income households say a larger proportion of their bulbs are CFL, as compared to those from upper income households (45% as compared to 37%).

© Corporate Research Associates Inc., 2016

Residence owners (as compared to renters) are far more likely to use *at least one* LED bulb, as are older and higher household income Nova Scotians. Similarly in terms of Halogen bulbs, residence owners (as compared to renters) are far more likely to use *at least one* Halogen bulb, as are older and higher household income Nova Scotians. There are not marked differences in terms of region.

The following table outlines the characteristics of residents who are most likely to utilize more of each specific type of light bulb in permanent light fixtures:

Permanent Light Fixture Bulbs*	
Light Bulb Type	**Residents Most Likely to Use More**
Regular bulbs (***over 50%*** **of permanent light fixture bulbs)**	No marked population subgroup differences
CFL (***over 50%*** **of permanent light fixture bulbs)**	• Those renting their residence • Residents living in a duplex/townhouse or an apartment • Nova Scotians with household incomes of $75,000 or less
LED (***at least one*** **permanent light fixture bulb)**	• Residence owners
Halogen (***at least one*** **permanent light fixture bulb)**	No marked population subgroup differences
* To be included in the table, identified groups are more likely to use permanent light fixture bulbs by a margin of at least 8 percentage points.	

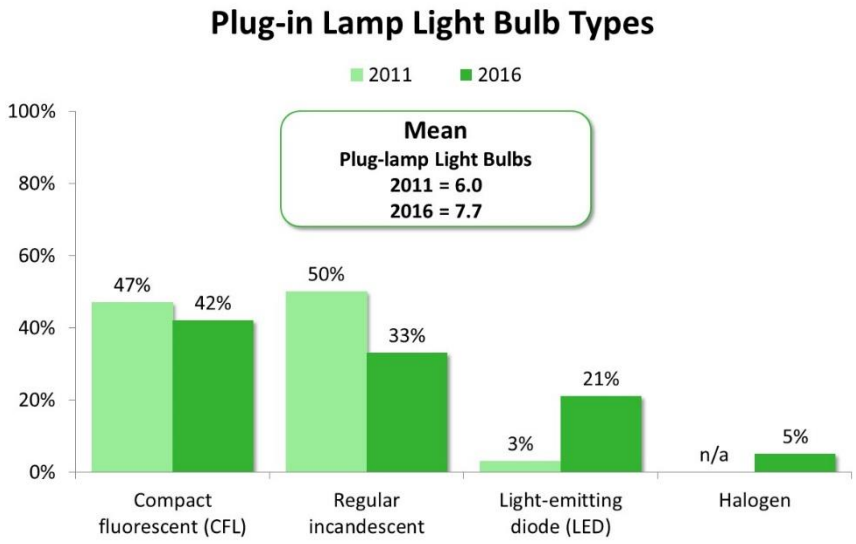
Energy Efficient Plug-in Lamp Bulbs

Plug-in lamp bulbs remain considerably less common than permanent light fixture bulbs.

As with permanent light fixture bulbs, use of at least one energy efficient LED or Halogen plug-in lamp bulb in 2016 is more prominent among Nova Scotians who own and do not rent their home. There is also a tendency for the incidence of at least one LED bulb to be more prevalent among older Nova Scotians, along with those with higher household incomes. The presence of CFL bulbs does not differ appreciably along these lines, although CFL bulbs comprise a greater percentage of all plug-in lamp bulbs among those who rent rather than own their home (51% vs 39%).

Turning to the types of light bulbs found in plug-in lamps, as previously implied, most plug-in lamps contain a more diverse mix of regular incandescent bulbs and energy efficient bulbs, as compared to 2011. (Tables A6a-e)

© Corporate Research Associates Inc., 2016



Q.A6a-e: a) Number of plug-in lamp light bulbs? (2011: n=1,004; 2016: n=1,008) b) How many are regular incandescent light bulbs? (2011: n=941; 2016: n=949) c) How many are halogen light bulbs? (2016: n=949) d) How many are compact fluorescent (CFL) light bulbs? (2011: n=941; 2016: n=949) e) How many are light-emitting diode (LED) light bulbs? (2011: n=941; 2016: n=949)

The following table outlines the characteristics of residents who are most likely to use more of each specific type of plug-in lamp bulb:

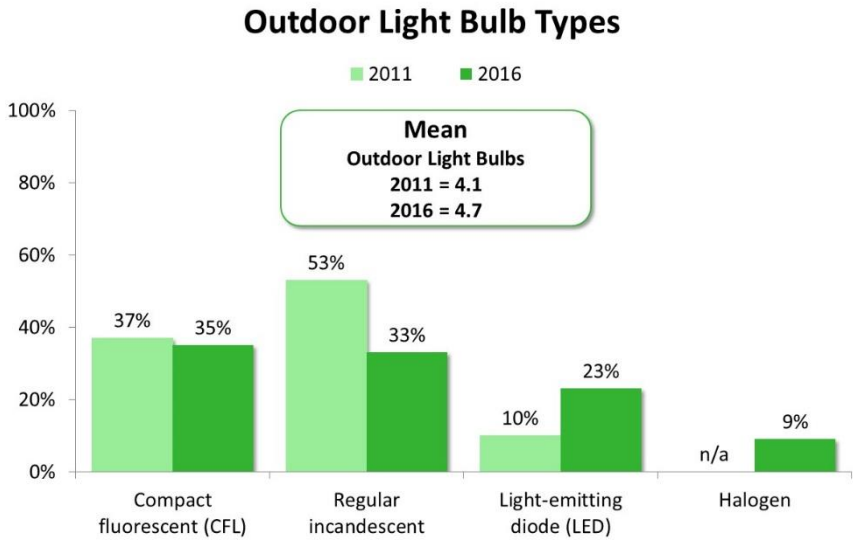
Plug-in Lamp Bulbs*	
Light Bulb Type	**Residents Most Likely to Use More**
Regular bulbs (***over 50%*** **of plug-in lamp bulbs)**	• Women
CFL (***over 50%*** **of plug-in lamp bulbs)**	• Those renting their residence • Residents living in a duplex/townhouse or an apartment
LED (***at least one*** **plug-in lamp bulb)**	• Residence owners • Residents living in a single detached dwelling
Halogen (***at least one*** **plug-in lamp bulb)**	No marked population subgroup differences
* To be included in the table, identified groups are more likely to use plug-in lamp bulbs by a margin of at least 8 percentage points.	

© Corporate Research Associates Inc., 2016

Energy Efficient Outdoor Light Bulbs

Whereas approximately one-half of outdoor light bulbs in 2011 were energy efficient bulbs, since that time this figure has risen to eight in ten.

Having at least one outdoor LED or Halogen energy efficient light bulb is more common among those who own rather than rent their home. Such a difference is not evident in terms of CFL bulbs. Whereas five years ago one-half of outdoor light bulbs were outfitted with regular incandescent bulbs (53%), in 2016 this figure has dropped to 33 percent. Just over one-third of outdoor light bulbs currently are CFL (35%, as compared to 37% in 2011), and one-quarter (23%) are LED bulbs (as compared to 10%). Halogen bulbs were not a force in 2011, but today account for approximately 9 percent of all outdoor light bulbs. (Tables A9a-e)



Q.A9a-e: a) Number of outdoor light bulbs? (2011: n=1,004; 2016: n=1,008) b) How many are regular incandescent light bulbs? (2011: n=893; 2016: n=904) c) How many are halogen light bulbs? (2016: n=904) d) How many are compact fluorescent (CFL) light bulbs? (2011: n=893; 2016: n=904) e) How many are light-emitting diode (LED) light bulbs? (2011: n=893; 2016: n=904)

The following table outlines the characteristics of residents who are most likely to use more of each specific type of outdoor light bulb:

© Corporate Research Associates Inc., 2016

Outdoor Light Bulbs*	
Light Bulb Type	**Residents Most Likely to Use More**
Regular bulbs (***over 50%*** **of outdoor light bulbs)**	• Women • Those renting their residence • Residents living in an apartment • Nova Scotians with household incomes of $75,000 or less
CFL (***over 50%*** **of outdoor light bulbs)**	• Those renting their residence
LED (***at least one*** **outdoor light bulb)**	• Residence owners • Residents between the ages of 35 and 54 years • Nova Scotians with household incomes greater than $75,000
Halogen (***at least one*** **outdoor light bulb)**	No marked population subgroup differences
* To be included in the table, identified groups are more likely to use outdoor light bulbs by a margin of at least 8 percentage points.	

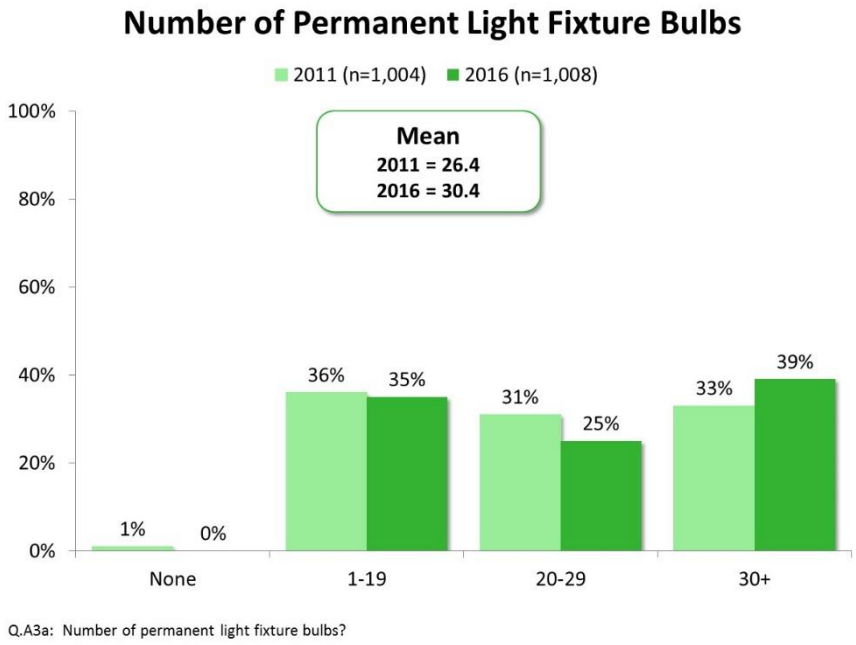
Light Bulb Count and Usage

Permanent Light Fixture Bulbs

Permanent light fixture bulbs remain by far the most common across Nova Scotia, with slightly more than one-half being used on a typical day.

As noted, based on the online survey results, Nova Scotia residents have an overall mean average of just over 30 permanent light fixture bulbs. One-third of residents have fewer than 20 permanent light fixture bulbs (35%, as compared to 36% in 2011), while one-quarter (25%) have between 20 and 29 permanent light fixture bulbs (down from 31% in 2011). Four in ten residents report owning 30 or more permanent light fixture bulbs (39%, up from 33% five years ago). (Table A3a)

© Corporate Research Associates Inc., 2016



Q.A3a: Number of permanent light fixture bulbs?

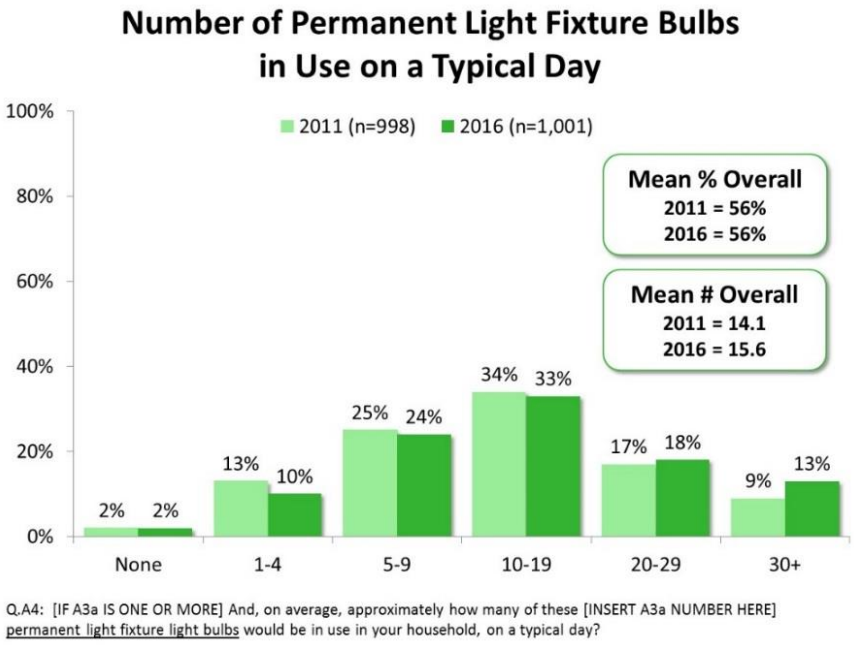
The incidence of permanent light fixture bulbs increases with age and annual household income of residents. As may be expected given that apartments often are comparatively smaller than houses, residents who own their home report having a higher number of permanent light fixture bulbs as compared to renters (34.1 as compared to 20.2).

Residents report using an average of approximately 16 permanent light fixture bulbs on a typical day, up from 14 in 2011. This amounts to just over one-half of their total permanent light fixture bulbs (56%, the same as in 2011) being typically used.

Another representation of permanent light fixture bulb use would be to examine the *proportion* of permanent light fixture bulbs used in relation to each resident's total number of permanent light fixture bulbs. Analysed from this perspective, fewer than one-half of residents indicate that on a typical day they use *one-half or fewer* of the permanent light fixture bulbs in their home (43%; this figure stood at 46% in 2011). The same percentage use *more than half, but not all* (45%, as compared to 41% five years ago), while one in ten residents indicate using *all* of the permanent light fixture bulbs in their home on a daily basis (10%, as compared to 12% in 2011).

Still another manner of discussing the use of permanent light fixture bulbs on a typical day is presented in the following graph. This graphic displays the *number* of permanent light fixture bulbs in use on a typical day, as opposed to the previously-discussed *proportions*. (Table A4)

© Corporate Research Associates Inc., 2016

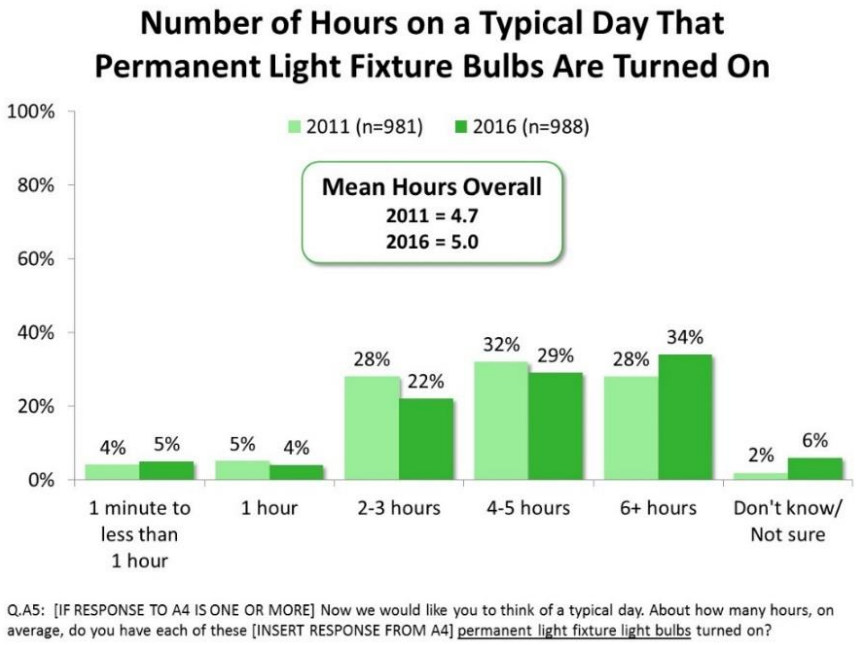


Q.A4: [IF A3a IS ONE OR MORE] And, on average, approximately how many of these [INSERT A3a NUMBER HERE] permanent light fixture light bulbs would be in use in your household, on a typical day?

When considering the proportion of permanent light fixture bulbs used in a typical day relative to residents' total number of permanent light fixture bulbs, differences across population subgroups are evident. As was the case in 2011, the proportion of permanent light fixture bulbs in use on a typical day decreases among older residents this year, and the likelihood of using *all* of one's permanent light fixture bulbs on a typical day is lower among homeowners as compared to renters, and modestly lower among higher household income Nova Scotians.

On average, residents this year report using their permanent light fixture bulbs for 5.0 hours on a typical day, just above findings from 2011. Between one-fifth and one-third of residents report turning on their permanent light fixture bulbs for two to three hours (22%, as compared to 28% in 2011), four to five hours (29%, as compared to 32%), or six hours or more (34%, as compared to 28% five years ago), while a combined 9 percent of residents use their permanent light fixture bulbs for one hour or less on a typical day (unchanged from 2011). (Table A5)

© Corporate Research Associates Inc., 2016



Q.A5: [IF RESPONSE TO A4 IS ONE OR MORE] Now we would like you to think of a typical day. About how many hours, on average, do you have each of these [INSERT RESPONSE FROM A4] permanent light fixture light bulbs turned on?

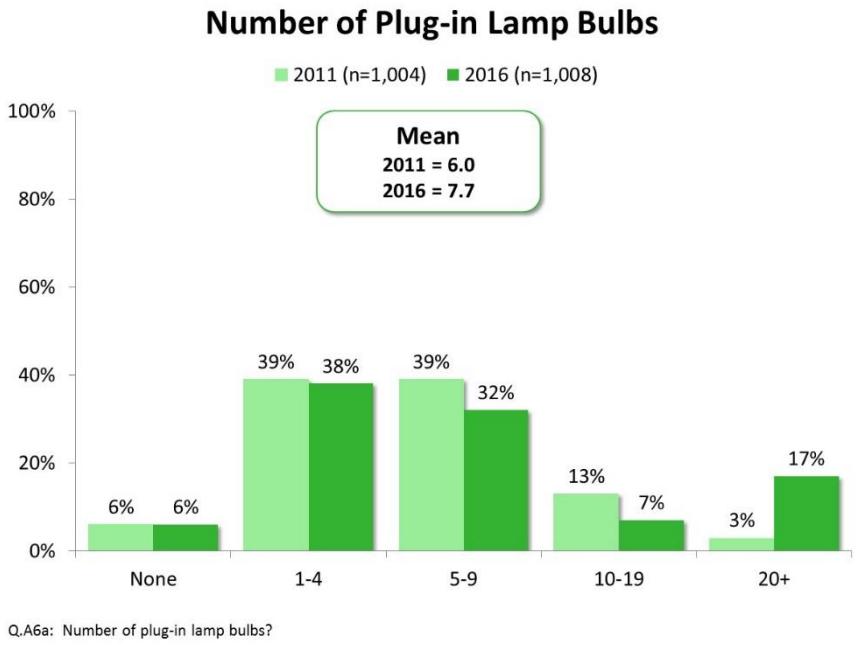
Although slightly fewer permanent light fixture bulbs are present per capita among Cape Breton (29.1) and Rest of Mainland (29.8) residents as compared to HRM (31.5), these bulbs are used slightly longer on average per day in Cape Breton (5.3 hours), as compared to 5.0 hours in each of Halifax Regional Municipality and elsewhere on the NS mainland. Homeowners are less likely than those who do not own their place of residence to have their permanent light fixture bulbs turned on for six hours or more, while younger (18-34) residents indicate that they are more likely than older residents (55+) to have their permanent light fixture bulbs turned on for six hours or more.

Plug-in Lamp Bulbs

Although there are considerably fewer plug-in lamp bulbs as compared to permanent light fixture bulbs, the percentage usage of plug-in lamp bulbs on a typical day is similar to the permanent light fixture bulb use pattern.

Across Nova Scotia, plug-in lamp bulbs are considerably less common as compared to permanent light fixture bulbs. As previously reported, as per the online survey results, Nova Scotia residents have an average of just under 8 plug-in lamp bulbs (as compared to 6 in 2011). Slightly less than one-half of residents have fewer than five plug-in lamp bulbs (44%, as compared to 45% five years ago), while one in three own between five and nine plug-in lamp bulbs (32%, as compared to 39% in 2011). Notably, one-quarter of residents report having ten or more plug-in lamp bulbs (24%, up notably from 16% five years ago). (Table A6a)

© Corporate Research Associates Inc., 2016



The number of plug-in lamp bulbs in one's home increases with age, as older residents (55+) have more than twice as many plug-in lamp bulbs than do younger residents 18 to 34 years of age (an average of 10.4 plug-in lamp bulbs, as compared to an average among younger folk of 4.7).

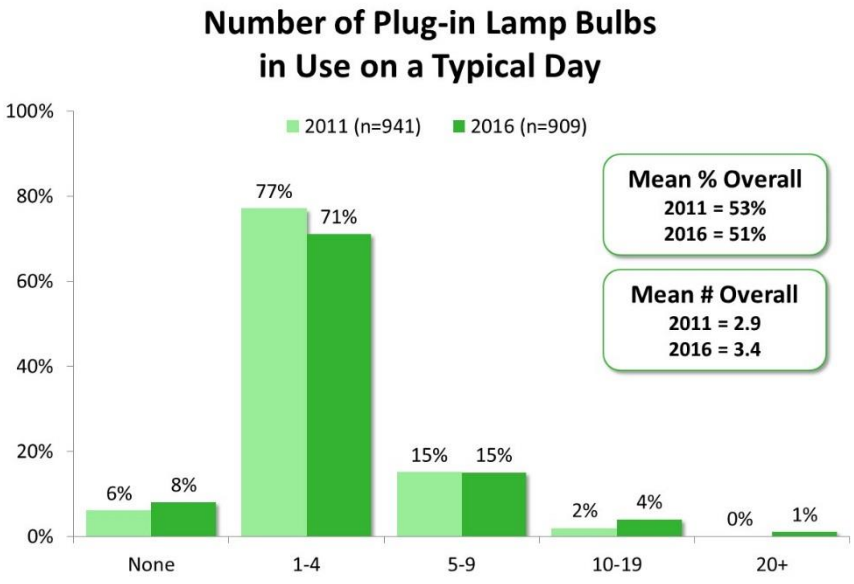
Interestingly, residents with full-time employment status are *more* likely to have a *smaller* average number of plug-in lamp bulbs, as compared to those who are not employed full-time. As well, the average number of plug-in lamp bulbs in 2016 is higher among home owners than among renters, and is higher among upper income households.

Given that the average resident owns approximately eight plug-in lamp bulbs, it is perhaps not surprising that a strong majority of respondents indicate in 2016 that they use fewer than five plug-in lamp bulbs on a typical day (79%), with the mean average being 3.4 bulbs.

Another representation of the use of plug-in lamp bulbs is to examine the *proportion* of plug-in lamp bulbs used in relation to each resident's total number of plug-in lamp bulbs. On average, residents use approximately one-half of their plug-in lamp bulbs on a typical day (51%, as compared to 53% five years ago). Six in ten indicate that they use *one-half or less* of their plug-in lamp bulbs on a typical day (61%, as compared to 58% in 2011), while one-fifth indicate that they use *more than half, but not all* of their plug-in lamp bulbs (20%, as compared to 23%). An additional two in ten report that they use *all* their plug-in lamp bulbs on a typical day (20%, as compared to 19% in 2011).

Still another manner of discussing the use of plug-in lamp bulbs on a typical day is presented in the following graph. This graphic displays the *number* of plug-in lamp bulbs in use on a typical day, as opposed to the previously-discussed *proportions*. (Table A7)

© Corporate Research Associates Inc., 2016



Q.A7: [IF A6a IS ONE OR MORE] And, on average, approximately how many of these [INSERT A6a NUMBER HERE] plug-in lamp bulbs would be in use in your household, on a typical day?

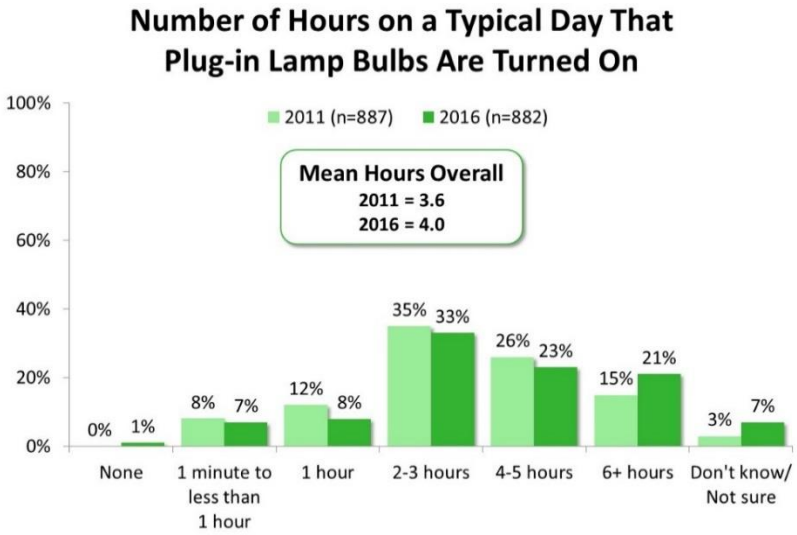
Proportional differences in plug-in lamp bulb usage are evident across population subgroups. Nova Scotians who rent their place of residence are more likely than home owners to use *all* their plug-in lamp bulbs on a typical day (28% as compared to 17%). Plug-in lamp bulb usage decreases noticeably as age increases, and also is lower among those with greater annual household incomes.

Residents use their plug-in lamp bulbs an average of 4.0 hours per day (up from 3.6 in 2011). Across Nova Scotia, on a typical day a small minority turn on their plug-in lamp bulbs either for less than one hour or not at all (8%, unchanged since 2011), while one in ten say their plug-in lamp bulbs are turned on for about an hour (8%, as compared to 12% five years ago). One-third of residents have their plug-in lamp bulbs turned on for two to three hours on a typical day (33%, as compared to 35%), while one-quarter indicate that their plug-in lamp bulbs are on for four to five hours daily (23%, as compared to 26%).

A sizeable minority indicate that their plug-in lamp bulbs are used for six hours or more per day (21%, as compared to 15% in 2011).

Among those most likely to have their plug-in lamp bulbs turned on for six hours or more are Cape Breton residents, and those with annual household incomes of less than $50K. (Table A8)

© Corporate Research Associates Inc., 2016

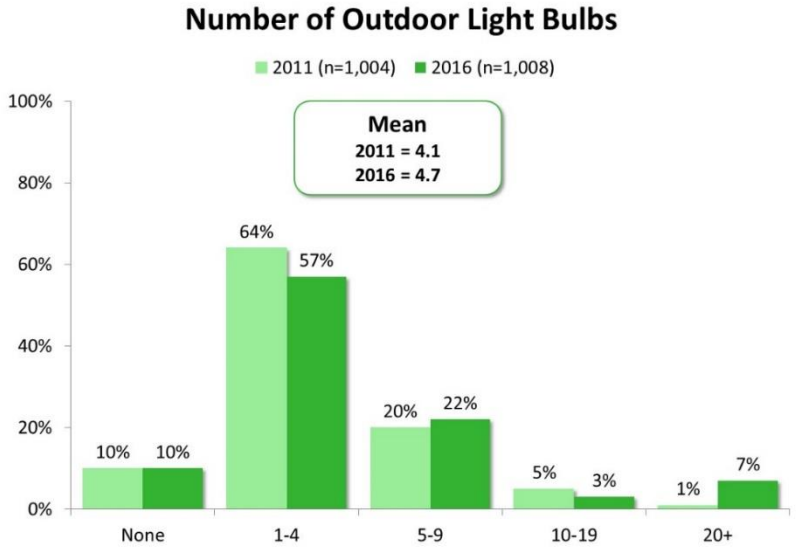


Q.A8: [IF RESPONSE TO A7 IS ONE OR MORE] Now we would like you to think of a typical day. About how many hours, on average, do you have each of these [INSERT RESPONSE FROM A7] plug-in lamp bulbs turned on?

Outdoor Light Bulbs

Outdoor light bulbs remain less common than permanent light bulbs and plug-in lamp bulbs.

As per the online survey results, Nova Scotia residents own an average of only approximately five outdoor light bulbs (4.7), up from approximately four in 2011 (4.1). Two-thirds of the population have fewer than five outdoor light bulbs (67%, as compared to 74% in 2011). Two in ten have five to nine outdoor light bulbs (22%, as compared to 20% five years ago), while a small minority have either 10 to 19 (3%, as compared to 5%), or 20 or more (7%, as compared to 1% five years ago) outdoor light bulbs. (Table A9a)

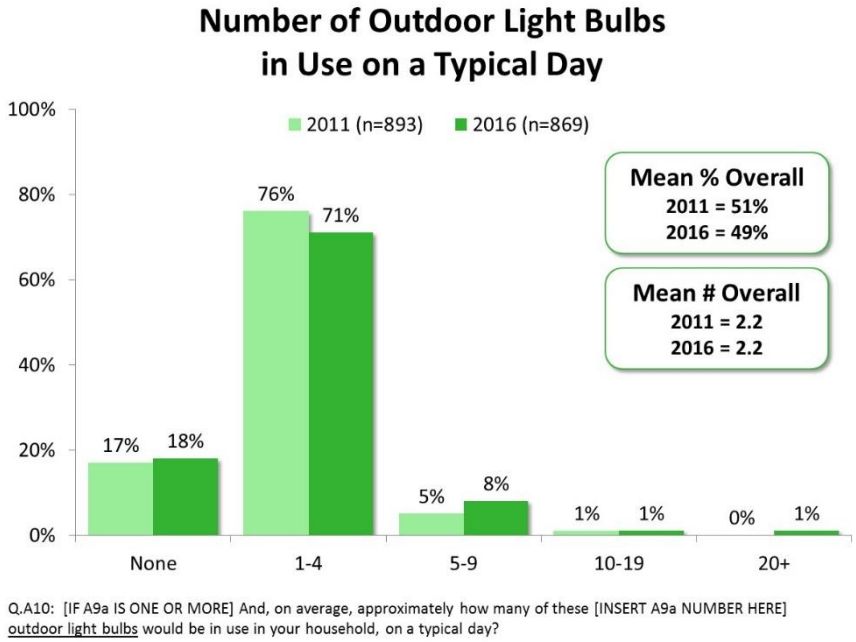


Q.A9a: Number of outdoor light bulbs?

© Corporate Research Associates Inc., 2016

The quantity of outdoor light bulbs on one's property varies considerably according to different characteristics across the population. By region, residents in HRM (4.1) have a smaller mean average number of outdoor light bulbs, as compared to those in Cape Breton (4.9) or the Rest of Mainland Nova Scotia beyond HRM (5.2). Almost all homeowners (97%) have at least one outdoor light bulb, compared to only seven in ten of those who do not own their place of residence (69%). In fact, homeowners indicate owning an average of more than two times as many outdoor light bulbs (5.5) as compared to non-homeowners (2.3). Finally, the mean average number of outdoor light bulbs increases with annual household income and age.

As the majority of residents own less than five outdoor light bulbs, it follows that the majority use less than five outdoor light bulbs (89%, as compared to 93% in 2011) on a typical day (an average of 2.2 are used in a typical day, unchanged since 2011). Another representation of outdoor light bulbs use would be to examine the proportion of outdoor light bulbs used in relation to each resident's total number of outdoor light bulbs. On average, residents use one-half of the outdoor light bulbs on their property on a typical day (49%, as compared to 51% in 2011). As slightly less than one-half of residents use *one-half or less* (but at least one) of their outdoor light bulbs (45%, as compared to 46% in 2011), and two in ten indicate using *none* of their outdoor light bulbs (18%, as compared to 17% five years ago) despite having at least one, the majority of residents use *one-half or less* of the outdoor light bulbs on their property on a typical day. One-quarter use *all* of their outdoor light bulbs (23% as compared to 25%), while an additional one in ten use *more than half* (but not all) of their outdoor light bulbs (13%, as compared to 12% in 2011). The following graph displays the *number* of outdoor light bulbs in use on a typical day, as opposed to the previously-discussed *proportions*. (Table A10)



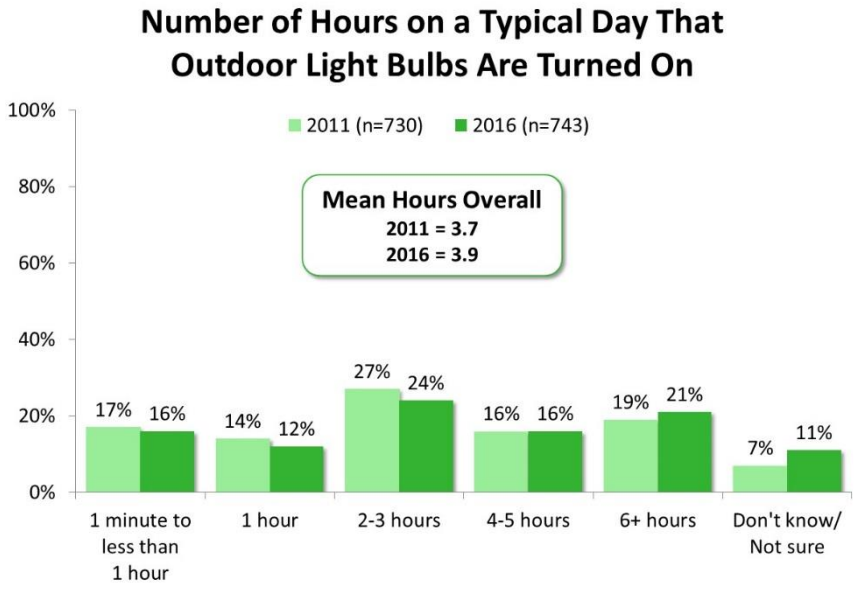
Q.A10: [IF A9a IS ONE OR MORE] And, on average, approximately how many of these [INSERT A9a NUMBER HERE] outdoor light bulbs would be in use in your household, on a typical day?

© Corporate Research Associates Inc., 2016

Outdoor light bulb usage also varies across several demographic characteristics in 2016. Residents of HRM residents are more likely than Cape Breton residents to use *none* of their outdoor light bulbs (22% as compared to 10%). Compared to homeowners, Nova Scotians in 2016 who rent their residence continue to show a stronger tendency to use either *all* (37% of renters, compared to 20% of homeowners) or *none* (33% as compared to 15%) of their outdoor light bulbs on a daily basis. Usage of outdoor light bulbs appears to decrease with respondent age. Further, a greater percentage of residents with lower household incomes, say they use *none* of their outdoor light bulbs on a typical day.

Residents report a large variation in the length of time that their outdoor light bulbs are turned on during a typical day. Overall, residents report turning on their outdoor light bulbs for an average of approximately four hours per day (approximately the same as in 2011).

One in five report leaving outdoor light bulbs on for six hours or more (21%, as compared to 19% five years ago), while less than two in ten use their outdoor light bulbs for four to five hours on a typical day (16%, unchanged). One in four indicate they use these lights for two to three hours (24%, as compared to 27%), and one in ten indicate that they typically use their outdoor light bulbs for one hour (12%, as compared to 14%). Two in ten residents report using their outdoor light bulbs for less than one hour on a typical day (16%, as compared to 17%). (Table A11)



Q.A11: [IF RESPONSE TO A10 IS ONE OR MORE] Now we would like you to think of a typical day. About how many hours, on average, do you have each of these [INSERT RESPONSE FROM A10] outdoor light bulbs turned on?

Across the population, residents in Cape Breton turn on their outdoor light bulbs for a longer period (4.9 hours, as compared to 4.8 hours in 2011) as compared to HRM residents (4.2 hours, as compared to 3.7 five years ago hours), and those elsewhere on mainland Nova Scotia (3.3 hours, as compared to 3.5 hours). There is a difference in the average length of time that younger residents aged 18 to 34, or middle aged residents (4.3 hours, as compared to 4.0 hours) leave their outdoor light bulbs on (4.2 hours, unchanged since 2011), as compared to older residents aged 55 years or over (3.4 hours, as compared to 3.1 hours). Older residents are less likely than younger residents to leave their outdoor light bulbs on for six hours or more.

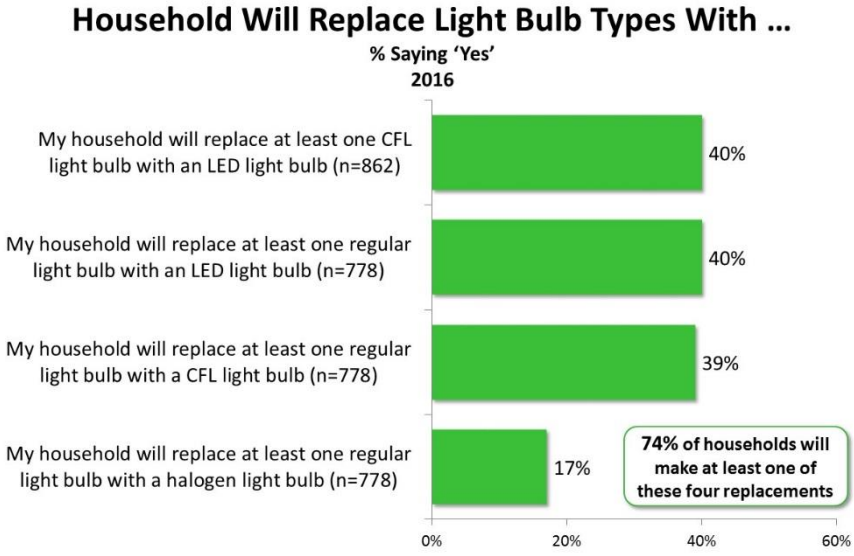
© Corporate Research Associates Inc., 2016

Intentions to Implement Energy Efficient Light Bulbs

Three-quarters of households intend to replace less-efficient bulbs in the next year with (more) energy efficient light bulbs.

In order to assess their intentions to improve the energy efficiency of their homes, residents were asked to indicate whether behavioural statements applied to their household in terms of replacing non-efficient (i.e., regular incandescent bulbs) or less-efficient (i.e., CFL bulbs) bulbs in the next year with more energy efficient light bulbs. When those with at least one regular incandescent light bulb were asked about CFL light bulbs specifically, a sizeable minority of residents indicate their intention to improve the efficiency of their light bulbs by **replacing at least one regular bulb with a CFL light bulb** (39%). Another one-quarter indicate that they are unsure (25%), while one-third say that they will not do so (35%). In terms of LED light bulbs, another sizeable minority of residents with at least one regular bulb in their home indicate their intention to improve the efficiency of their light bulbs by **replacing at least one regular bulb with an LED light bulb** (40%). Another one-third indicate that they are unsure (34%), while one-quarter say that they will not do so (25%).

In terms of Halogen light bulbs, a smaller minority of residents with at least one regular bulb indicate their intention to improve the efficiency of their light bulbs by **replacing at least one regular bulb with a Halogen light bulb** (17%). Almost four in ten indicate that they are unsure (37%), while almost one-half say that they will not do so (46%). Finally, a sizeable minority of residents with at least one CFL bulb indicate their intention to improve the efficiency of their light bulbs by **replacing at least one CFL bulb with an LED light bulb** (40%). Almost four in ten indicate that they are unsure (38%), while one-fifth say that they will not do so (22%). (Tables A13a-d)



Q.A13a-d: [A13a-c IF ONE OR MORE REGULAR, INCANDESCENT BULBS IN A3, A6, AND/OR A9; A13d IF ONE OR MORE CFL BULBS IN A3, A6, AND/OR A9] Thinking ahead over the next year, please indicate which, if any, of the following statements apply to your household.

© Corporate Research Associates Inc., 2016

In terms of switching at least one regular incandescent bulb to an LED light bulb, there is a tendency for this situation to more so occur in Cape Breton as compared to HRM, among homeowners rather than renters, among older rather than younger residents, and among higher rather than lower income households.

In terms of switching at least one CFL bulb to an LED light bulb, there is a tendency for this situation to again more so occur among homeowners rather than renters, and among older rather than younger residents.

There are no major subgroup differences in terms of regular to CFL switching, or in terms of regular to Halogen switching.

In-Home Verification Visits

As mentioned in the Introduction, a total of 50 in-home verification visits were made among survey respondents, to count the actual number of bulbs within surveyed households. A comparison of survey versus verification visit results is presented in this section of the report. A key overall observation, as evident in the table immediately below, is that whereas 2011 survey respondents notably understated on their survey questionnaire responses regarding the number of regular light bulbs in permanent light fixtures in their households, this tendency was much less evident this year. Indeed, in general the survey responses very closely match the verification visit results in terms of bulb type + lighting type.

It is important to note, however, that whereas it was noted earlier in this report that comparing the 2016 (n=1,008) online survey results to the 2011 (n=1,004) online survey results indicated an increase over the past five years in the absolute number of bulbs/sockets in the province, the in-home verification visits do not provide evidence to support this assertion. Indeed, whereas the total average number of bulbs counted in 2011 was 54.2 per in-home visit, in 2016 this figure had dropped to 42.6 per home. Accordingly, there is not conclusive evidence to support the notion (based solely on the n=1,004/1,008 year-over-year survey data) that the absolute number of bulbs in the province, per household, has climbed over the past half-decade.

Panel vs. Site Visit Analysis

Types	Study	CFL			LED			Regular			Halogen		
		Panel	Site	Diff	Panel	Site	Diff	Panel	Site	Diff	Panel	Site	Diff
Permanent	2011	14.3	14.8	↑0.5	1.5	0.3	↓1.2	13.2	24.1	↑10.9	*n/a*	*n/a*	*n/a*
	2016	**11.7**	**12.2**	↑0.5	**12.0**	**11.0**	↓1.0	**5.1**	**8.5**	↑3.4	**1.4**	**1.2**	**↓.0.2**
Plug-in	2011	3.7	3.8	↑0.1	0.3	0.4	↑0.1	2.6	4.8	↑2.2	*n/a*	*n/a*	*n/a*
	2016	**3.3**	**1.9**	**↓1.4**	**2.3**	**2.0**	↓0.3	**1.3**	**1.5**	↑0.2	**0.4**	**0.1**	**↓0.3**
Outdoor	2011	1.6	1.5	↓0.1	0.5	0.1	↓0.4	2.2	4.4	↑2.2	*n/a*	*n/a*	*n/a*
	2016	**2.1**	**1.3**	↓0.8	**1.4**	**1.2**	↓0.2	**0.5**	**1.3**	↑0.8	**0.6**	**0.4**	**↓0.2**

Note: Some 'Differences' may not add up due to rounding.

© Corporate Research Associates Inc., 2016

CFLs

Mean scores suggest that in general panel members accurately count the number of CFL bulbs in their home. That said, 28 percent underestimated their number of permanent CFL bulbs by at least three bulbs (was 34% in 2011), and 29% percent overestimated by the same amount (was 23%). Strong majorities of residents correctly estimate their number of outdoor or plug in CFL bulbs.

Estimate of Number of Light Bulbs	Permanent CFL		Plug-in CFL		Outdoor CFL	
	2011	2016	2011	2016	2011	2016
Underestimated by 11+	7%	**8%**	2%	**0%**	*n/a*	**0%**
Underestimated by 3-10	27%	**20%**	17%	**6%**	9%	**6%**
Correctly estimated within 2	**43%**	**44%**	**67%**	**74%**	**82%**	**84%**
Overestimated by 3-10	19%	**25%**	9%	**14%**	8%	**6%**
Overestimated by 11+	4%	**4%**	5%	**6%**	*n/a*	**4%**

Regular Light Bulbs

A sizeable minority of residents underestimate the number of regular permanent light bulbs in their home (44% this year, as compared to fully 72% in 2011). One in ten underestimate the number of plug-in regular light bulbs (12%, as compared to 39% in 2011), while the majority correctly estimates the number of regular outdoor light bulbs (86%, as compared to 78% five years ago).

Estimate of Number of Light Bulbs	Permanent Regular		Plug-in Regular		Outdoor Regular	
	2011	2016	2011	2016	2011	2016
Underestimated by 11+	43%	**11%**	2%	**0%**	8%	**0%**
Underestimated by 3-10	29%	**33%**	37%	**12%**	5%	**14%**
Correctly estimated within 2	**17%**	**40%**	**50%**	**80%**	**78%**	**86%**
Overestimated by 3-10	7%	**8%**	8%	**8%**	9%	**0%**
Overestimated by 11+	2%	**8%**	2%	**0%**	*n/a*	**0%**

LED Bulbs

Residents are generally correct when estimating the number of LED bulbs in their home, with at least six in ten residents correctly estimating their permanent, plug-in and outdoor LED light bulbs.

Estimate of Number of Light Bulbs	Permanent LED		Plug-in LED		Outdoor LED	
	2011	2016	2011	2016	2011	2016
Underestimated by 11+	*n/a*	**4%**	*n/a*	**0%**	*n/a*	**0%**
Underestimated by 3-10	6%	**14%**	7%	**12%**	2%	**4%**
Correctly estimated within 2	**77%**	**62%**	**91%**	**80%**	**91%**	**88%**
Overestimated by 3-10	14%	**14%**	2%	**6%**	6%	**8%**
Overestimated by 11+	2%	**6%**	*n/a*	**2%**	*n/a*	**0%**

© Corporate Research Associates Inc., 2016

Halogen Bulbs

Residents very closely estimated the number of Halogen bulbs in their home, with at least 85 percent of residents correctly estimating their permanent, plug-in and outdoor Halogen light bulbs.

Estimate of Number of Light Bulbs	Permanent Halogen		Plug-in Halogen		Outdoor Halogen	
	2011	2016	2011	2016	2011	2016
Underestimated by 11+	*n/a*	**2%**	*n/a*	**0%**	*n/a*	**0%**
Underestimated by 3-10	*n/a*	**5%**	*n/a*	**0%**	*n/a*	**2%**
Correctly estimated within 2	*n/a*	**85%**	*n/a*	**94%**	*n/a*	**93%**
Overestimated by 3-10	*n/a*	**4%**	*n/a*	**6%**	*n/a*	**6%**
Overestimated by 11+	*n/a*	**4%**	*n/a*	**0%**	*n/a*	**0%**

Study Methodology

Questionnaire Design and Survey Administration

The questionnaire used for this study was designed by CRA, in consultation with Efficiency Nova Scotia and Econoler staff members. Prior to being finalized, the survey was pre-tested on a small number of respondents to ensure the appropriateness of the questions and response categories.

This survey of a general public online panel was conducted using an online panel from November 17 to 29, 2016, with adult residents in Nova Scotia aged 18 or older. The survey was programmed by CRA, and the general public panel members utilized for sampling purposes were drawn from an online panel overseen by the Logit Group (formerly Cido Research). CRA on many occasions has successfully called upon the professional services of Cido. The total number of completed surveys for the present study was 1,008. The survey required an average of 11 minutes to complete.

A total of 50 in-home verification visits with survey respondents were conducted between November 25 and December 8, 2016. Christmas lights were not included in the final tabulated results. These visits entailed CRA staff gaining compliance from respondents to enter their households and count their light bulbs of various types. Respondents were given $50 as thanks for granting this compliance. The visits occurred across the province, with a distribution as follows:

- Halifax Regional Municipality: 25 visits
- South Shore: 4 visits
- Annapolis Valley: 7 visits
- Northern NS: 7 visits
- Cape Breton Island: 7 visits

The collected data from the verification process was weighted to match the actual distribution of residents within Nova Scotia.

© Corporate Research Associates Inc., 2016

NON-CONFIDENTIAL

Request IR-09:

For Efficient Product Rebates of BNI category of proposed 2019 DSM Plan, please provide the budget and targets, both energy savings and peak demand savings, by following proposed list of measures included in DSM Filing (EfficiencyOne 2019 DSM Plan Filing – Appendix A, Page 13 of 24, Line 4 – 8):
"A variety of measures are supported in this program. The list of measures will continue to evolve over time, and is expected to include measures such as: lighting; HVAC systems and controls; agricultural equipment; variable speed drives for motors; compressed air; refrigeration; kitchen / food service and IT technologies."

Response IR-09:

EfficiencyOne targets are filed at the program and/or component level; EfficiencyOne does not set measure-level targets. For a breakout of claimed savings by measure please see Table 11 and Table 31 of the 2017 Efficient Product Rebates DSM Evaluation Report.

NON-CONFIDENTIAL

Request IR-10:

Regarding the DSM programs offered to small business customers:

a) What is the criteria used by EfficiencyOne and NSP to define a small business customer?

b) For these DSM programs offered in 2016 and 2017, please provide the performance metrics (budget, energy and demand savings, and first-year unit cost) including only measures offered to the small business customers.

c) For these DSM programs currently offered for 2018 and proposed in 2019, please provide the performance metrics (budget, energy and demand savings, and first-year unit cost) including only measures that will be offered to the small business customers.

Response IR-10:

a) EfficiencyOne defines small businesses as customers who:

- have an NS Power rate code of 04, 10, 11, 21, or a Small General or General Municipal Electric Utility rate code;
- have an annual electrical energy consumption of less than 350,000 kWh; and
- are located within Nova Scotia.

b) All measures offered through the Direct Installation program (marketed as Small Business Energy Solutions) and the Efficient Product Rebates program (marketed as Business Energy Rebates) are available to and accessible by small business customers. Please refer to Table 1 below.

NON-CONFIDENTIAL

Table 1: 2016 and 2017 Performance Metrics for Programs Offered to Small Business Customers

Year	Program Component	First-Year Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ million)	First-Year Unit Cost ($/kWh)
2016	Business Energy Rebates	37.8	7.1	6.2	0.16
2016	Small Business Energy Solutions	4.1	1.1	2.9	0.69
2017	Business Energy Rebates	46.6	7.3	6.8	0.15
2017	Small Business Energy Solutions	7.9	1.4	3.8	0.48

c) Please refer to part b) above, and Table 2 below.

Table 2: Planned 2018 and 2019 Performance Metrics for Programs Offered to Small Business Customers

Year	Program Component	Planned First-Year Energy Savings (GWh)	Planned Peak Demand Savings (MW)	Planned Expenditures ($ million)	Planned First-Year Unit Cost ($/kWh)
2018	Business Energy Rebates	50.6	7.9	7.8	0.15
2018	Small Business Energy Solutions	9.6	1.7	4.0	0.42
2019	Business Energy Rebates	32.5	5.1	5.2	0.16
2019	Small Business Energy Solutions	9.3	1.5	4.1	0.44

NON-CONFIDENTIAL

Request IR-11:

Regarding the measures included in Direct Installation program

a) Please supply a table that contains list of measures offered via Direct Installation program for every year during 2016 and 2017. In the same table, please include the measure-level actual budget spent, achieved energy and demand savings, and first-year unit costs for 2016 and 2017.

b) For 2018, please provide the estimated budget, energy and demand savings target, and estimated first-year unit cost for each of the measure that are currently being offered in Direct Installation program.

c) Similarly, for 2019, please provide the estimated budget, energy and demand savings target, and estimated first-year unit cost for each of the measure that will be offered in Direct Installation program.

Response IR-11:

a) The Direct Installation program was evaluated using a methodology that presented savings information at the end-use level in 2016 and 2017, therefore the requested information can only be provided at the end-use, as opposed to measure, level. Please refer to EfficiencyOne's response to Synapse IR-11 for this information.

b) EfficiencyOne targets are filed at the program and/or component level; EfficiencyOne does not set measure-level targets. Please refer to the Direct Installation section (Rows 152-192) of Attachment 1, filed electronically, for the technical tables filed as part of ENS's 2016-2018 DSM Resource Plan. This is the most recent 2018 *forecast* of energy (Column AY) and demand savings (Column AX), as well as budget (Column BF), by measure for the Direct Installation program.

c) Please refer to part b). As the 2019 DSM Resource Plan is based on a continuation of the 2016-2018 DSM Resource Plan, EfficiencyOne has not developed measure-level

forecasts or budgets for 2019. Further to the continuation approach, EfficiencyOne anticipates the 2019 amounts would be consistent with the 2016-2018 technical tables.

NON-CONFIDENTIAL

Request IR-12:

Referring to the 2017 DSM Evaluation Results of Direct Installation program

a) Please explain why Direct Installation category appears to include Affordable Multifamily Housing Pilot results in the Small Business Energy Solutions portfolio (2017 DSM Annual Report, Page 29, Line 14 – 15). Please provide the UARB Order or other documentation that supports this classification.

b) Please provide a revised version of Table 1 (2017 DSM Annual Report, Page 2) that splits the results reported for Direct Installation into Multifamily Housing Pilot program and SBES program.

c) Please confirm what part of the results for Multifamily Housing Pilot program and the regular SBES program were not related to lighting.

Response IR-12:

a) The Affordable Multifamily Housing Pilot (the "pilot"), is included in the Direct Installation program (marketed as Small Business Energy Solutions or "SBES") as the pilot uses the same delivery framework as SBES and offers similar energy-efficient measures, with the addition of an affordable-housing criterion rather than an energy consumption requirement. The pilot, which began in 2016, provides affordable-housing owners with incentives for building-wide energy-retrofit projects. Although the audits and upgrades take place in residential buildings, the pilot works with landlords rather than the tenant to implement measures.

As SBES was already assisting common-area projects for Multi-Unit Residential Buildings (MURBs), the audit and rebate process needed for the pilot was already in place within SBES. The majority of measures anticipated to be recommended through the audit phase of the pilot were also already available through SBES (e.g., lighting and heat pumps).

New pilots are designed within EfficiencyOne's normal course of operations in its implementation of UARB-approved DSM Plans.

b) The following table breaks down Direct Installation's 2017 Mid-Course Adjusted planned savings, 2017 actuals (results), and planned spending to provide visibility to the pilot and regular program results.

	Energy Savings (GWh)		Peak Demand Savings (MW)		Expenditures ($m)	
	Planned	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**
SBES-only	7.0	7.6	1.5	1.3	3.3	3.7
Pilot	1.8	0.3	0.4	0.1	0.5	0.1
Total	8.8	7.9	1.9	1.4	3.9	3.8

Numbers may not sum due to rounding.

c) Non-lighting measures accounted for 0.25 GWh (92 percent) of the net incremental energy savings from the pilot.

Non-lighting measures accounted for 1.36 GWh (18 percent) of the net incremental energy savings from the regular SBES program.

NON-CONFIDENTIAL

Request IR-13:

Please provide the best estimate of the cost breakdown of Direct Installation program offered in 2018 into the following categories:

- **Direct program incentives,**
- **Indirect costs such as program support, marketing, outreach, and education**
- **Direct staff costs**
- **other remaining costs not identified above**

Response IR-13:

A breakdown of costs for the Direct Installation program (marketed as Small Business Energy Solutions) is provided below.

Small Business Energy Solutions Program
2018 Cost Estimates

Direct Program Incentives	$	2,686,000
Indirect Costs		
Marketing, Outreach, Education & Research	$	205,000
Evaluation & Verification	$	101,000
	$	306,000
Direct Staff Costs	$	807,000
Other Costs		
Bad Debt	$	12,000
Professional Fees & Consulting	$	45,000
Information Technology	$	88,000
Meetings & Travel	$	26,000
Office & Insurance	$	20,000
Rent	$	60,000
	$	251,000
Total 2018 Cost Estimate	**$**	**4,050,000**

NON-CONFIDENTIAL

Request IR-14:

Please list all the marketing and outreach programs completed for Direct Installation program for 2017 and please identify whether those programs were targeted to future participants vs Small Business Energy Auditor (SBEA).

Response IR-14:

ENS's 2017 Direct Installation (marketed as Small Business Energy Solutions or "SBES") marketing and outreach programs targeted future participants. Marketing efforts completed for 2017:

- **Newsletter** - reaching the small business audience through five newsletters highlighting success stories, upcoming events, tips, and ENS news throughout the year.
- **Paid advertising -** including digital, TV advertising, radio, out-of-home, print, and social media. The campaign, which ran throughout the year sought to generate awareness and drive the small business audience to the business profile, which provides a means for small business customers to access SBES and identify ways to maximize their savings.
- **Success stories** – two small business success stories showcased customers who participated in SBES. The objective of this initiative was to increase awareness of the benefits of SBES to encourage other small businesses to participate. The success stories were shared online through ENS's website and social media channels in Q2, as well as with partners and distributed in ENS's newsletter. Printed copies were distributed at meetings and events throughout the year.
- **Product Rebate Applications and the SBES Application Process** - revised to streamline how customers access ENS's small business services.
- **Website -** updated ENS's website content to reach the small business audience effectively.
- **Associations, events, and partnerships** - hosted Small Business Week events in four locations, providing tips and service offerings to small business owners.
- **Printed material** – including business cards with a website link to the business profile and energy saving tips.

NON-CONFIDENTIAL

Request IR-15:

Regarding the incentive levels for measures included in Direct Installation program:

a) Please list the measure-level incentive levels proposed for 2019 DSM plan for measures offered via Direct Installation program.

b) Are there any changes in the incentive levels of measures included in the Direct Installation program between 2018 and 2019? If so, please list the incentive levels of both 2018 and 2019 DSM plans.

Response IR-15:

a) The 2019 DSM Resource Plan used a continuation approach rather than building a new bottom-up model and, as such, does not have a specific incentive level for each measure that would be offered in 2019. However, ENS anticipates the measures and incentive levels will be similar to those offered in 2018.

The Direct Installation program offers incentives on the same measures as the Efficient Products Rebates program (marketed as Business Energy Rebates or BER). Please refer to Attachment 1 of this IR response for a list of measures and minimum incentive levels currently offered under the Efficient Product Rebates and Direct Installation programs.

b) As with all EfficiencyOne programs, Direct Installation's measures and incentive levels are subject to change, based on market trends, evaluation and verification results, and program needs. As such, there may be changes between 2018 and 2019 incentive levels, however, none have been identified at this time.

Efficient Product Rebates
Commercial Agricultural Rebate Guide

The following tables list the product requirements and rebates available for a range of energy-efficient agricultural technologies. For more information please visit our website **efficiencyns.ca**. Rated efficiency for ventilation fans may be listed as "VER" (Ventilating Efficiency Ratio). For Circulation fans, rated efficiency may be listed as "Efficacy Ratio", measured in thrust-cfm/Watt.
Visit **bess.illinois.edu** and **amca.ord** for more information.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

High Efficiency Fans

Product	Criteria	Diameter (Inches)	Minimum Efficiency (Cfm/Watt)	Rebate
Ventilation Fan (Exhaust or Supply Fan)	• BESS or AMCA listed • CSA / cUL rated	≤17	11	$45
		18-35	13	$55
		36-48	20	$65
		>49	23	$85
Circulation Fan	• BESS or AMCA listed • Must replace existing circulation fans (unless building is new construction) • CSA / cUL rated	18-35	14	$25
		36-49	20	$50
		>50	27	$75

High Volume Low Speed Fans (HVLS)

Product	Criteria	Size (feet)	Rebate
High Volume Low Speed Fans (HVLS)	• Must replace existing circulation fans (unless building is new construction) • CSA / cUL rated • For agricultural facilities only	8-12	$400
		14-24	$1000

Agriculture Heat Pads

Size	Criteria	Wattage	Rebate
Single Heat pad	• Must replace incandescent heat lamps • CSA / cUL rated	<100	$60
Double Heat Pad		<200	$120

Dual & Natural Ventilation

Facility Operation Time	Criteria	Rebate
Year-round	• Both natural and dual ventilation systems that meet the following criteria are elegible: - **Natural Ventilation** – no mechanical ventilation present. All ventilation provided by chimneys and sidewall openings (with curtains or panels). - **Dual Ventilation** – Mechanical ventilation to moduate exhaust in winter months only. • New construction and retrofits elegible for rebate. • Eligible facility types: dairy cows, swine, layers, broilers, turkeys, and sheep.	$0.10 / sq. ft.
Winter only		$0.06 / sq. ft.

Note: For facility types not listed, where mechanical ventilation has been or would traditionally be employed, contact Efficiency Nova Scotia for a customized rebate.

Livestock Waterers

Product	Criteria	Wattage	Rebate
Low-Energy or Zero-Energy Livestock Waterers	• Must contain a minimum of 2 inches insulation and an adjustable thermostat • CSA / cUL rated	≤300	$100

Engine Block Timer

Product	Criteria	Rebate
Engine Block Heater Timer	• Must control engine block heater timer of at least 400 Watts • Must not replace existing heater timer • CSA / cUL rated	$40

Dairy Farm Equipment

Product	Criteria		Rebate
Dairy Scroll Compressor	• Must replace reciprocating compressor		$50 / hp
Heat Reclaimer Unit (HRU)	• Must electrically heat water • Cannot be replacing existing HRU		$1,250 / unit
Milk Pre-cooler	• Cannot be replacing existing milk pre-cooler • New construction and retrofits eligible for rebates	10-49 Plates	$750 / unit
		50+ Plates	$1,400/unit
VFD Milk Vacuum Pump	• Cannot be replacing existing VFD • Must milk at least 50 cows		$140 / hp controlled
VFD Milk Transfer Pump	• Must have pre-cooler installed • Must milk at least 75 cows		$200 / unit

Note: Not all vacuum pump motors are compatible with VFDs. For more information contact your supplier.

Efficient Product Rebates
Commercial Compressed Air Equipment Rebate Guide

The following tables list the product requirements and rebates available for energy-efficient compressed air products. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Air-Entraining Air Nozzles

Product Requirements	Rebate
Air-entraining air nozzles are more energy-efficient than hand-held/fixed air nozzles. They use less compressed air for cleaning and drying by collecting the surrounding atmospheric air. **Note:** Nozzles exceeding 14 CFM at 100 psi are not eligible for rebates.	$100 / unit

Cycling Refrigerated Air Dryers

Capacity (CFM)	Product Requirements	Rebate
0 - 25	• Cycling refrigerated dryers automatically turn on and off in response to load instead of running continuously. • Dryers up to 300 cubic feet per minute (CFM) capacity are eligible for rebates.	$25
26 - 50		$50
51 - 100		$100
101 - 150		$150
151 - 200		$200
201 - 250		$250
251 - 300		$350

No-Loss Drains

Product Requirements	Rebate
Timed drains use a timer to set a local lower limit of condensation in the system and often release valuable compressed air along with condensate. A no-loss drain opens the valve only when signaled by a condensate-level controller and is therefore more energy-efficient. **Note:** Timed drains are not eligible for rebates.	$120 / unit

Efficient Product Rebates
Commercial Heating Rebate Guide

The following tables list product requirements and available rebates for a range of energy-efficient commercial heating equipment. If you are looking for Variable Frequency Drive (VFD) rebates for HVAC equipment please see the Commercial VFD Rebate Guide. For more information please visit our website **efficiencyns.ca/business**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Integrated Dual Enthalpy Economizer Controls

Product	Requirements	Rebate
Integrated Dual Enthalpy Economizer Controls	• Must be installed on new equipment that is also eligible for rebates	$250

HVAC Hotel Occupancy Sensors

Product	Requirements	Rebate
With building integrated intelligent control	• Must control electric heating • Maximum of one rebate per room • Must set back temperature when space is not occupied • Hotel must operate year round	$75
Without building integrated intelligent control		$50

Small Air Source Heat Pumps - Installed in Multi-Unit Facilities (3 or more units)

Size (Nominal Capacity)	Type	Min HSPF (Region IV)	Min SEER	Requirements	Rebate
< 65,000 Btu/h (< 5.4 tons)	Ductless Mini-Split Heat Pump	11	17	• Applicant must be property owner • Property must have three units or more and be electrically heated • Heat pump must be utilized over the heating season • Systems must be AHRI matched systems • Contact us prior to purchase if replacing an existing air-source heat pump or in new construction	$200 / ton
	Centrally Ducted Split System Heat Pump	8.5	15		$400 / ton

Small Air Source Heat Pumps - Installed in Commercial Facilities

Size (Nominal Capacity)	Type	Min HSPF (Region IV)	Min SEER	Requirements	Rebate
< 65,000 Btu/h (< 5.4 tons)	Single Package Systems	8.2	15	• Facility must be commercial property • Heat Pump must be utilized over the heating season • Must off-set electric resistance heating • Systems must be AHRI matched systems • Contact us prior to purchase if replacing an existing air-source heat pump or in new construction	$300 / ton
	Centrally Ducted Split System Heat Pump	8.5	15		$400 / ton
	Ductless Mini-Split Heat Pump	11	17		$300 / ton
		12	22		$400 / ton
		14	30		$500 / ton

Large Air Source Heat Pumps

Single package (unitary) systems, ducted split systems, ductless split systems and variable refrigerant flow units are eligible for rebates.

Size (Nominal Capacity)	High Heating (47F) Min COP	Low Heating (17F) Min COP	Min EER	Requirements	Rebate
≥ 65,000 Btu/h and < 135,000 Btu/h	3.3	2.25	10.8	• Heat pump must be utilized during heating season • Must off-set electric resistance heating • Systems must be AHRI certified matched systems. More information at ahridirectory.org • Contact us if replacing an existing air-source heat pump or in a new construction	$500 / ton
	3.6	2.45	11.9		$600 / ton
≥ 135,000 Btu/h and < 240,000 Btu/h	3.2	2.05	10.4		$500 / ton
	3.5	2.25	11.4		$600 / ton
≥ 240,000 Btu/h	3.2	2.05	10.4		$500 / ton
	3.5	2.25	11.4		$600 / ton

Ground & Water Source Heat Pumps*

Size (Nominal Capacity)	Min EER	Min COP	Requirements	Rebate
Open Loop	16.2	3.6	• Heat pump must be utilized during heating season • Must off-set electric resistance heating • Systems must be AHRI certified matched systems. More information at ahridirectory.org • Contact us if replacing an existing air-source or water source heat pump or in a new construction • Water loop heat pumps connected to a cooling tower and boiler are not eligible for incentives	$500 / ton
	20.0	4.0		$600 / ton
Closed Loop / Direct Geoexchange (DGX)	13.4	3.1		$500 / ton
	16.0	3.6		$600 / ton

*Tested in accordance to ASHRAE / ANSI / AHRI / ISO standard 13256-1 & 2:2012.

efficiency™ NOVA SCOTIA Enjoy the good things efficiency brings.

Air-to-Water Heat Pumps

Size (Nominal Capacity)	Min EER	Min COP	Requirements	Rebate
≤ 240,000 Btu/h	12.5	3.5	• Heat pump must be utilized during heating season • Must off-set electric resistance heating • Contact us if replacing an existing air-source or water source heat pump or in a new construction	$500 / ton

Packaged Terminal Heat Pumps (PTHP)

Size (Nominal Capacity)	New Construction (Standard Size*)		Replacement (Non-Standard Size**)		Requirements	Rebate
	High Heating (47F) Min COP	Low Heating (17F) Min COP	Min EER	Min COP		
< 11,000 Btu/h	11.0	3.3	9.3	2.7	• Heat pump must be utilized during heating season • Must off-set electric resistance heating • Must be AHRI certified (standard size only) • Contact us if replacing an existing PTHP unit or in a new construction	$300 / per unit
≤ 11,000 Btu/h	10.0	2.8	7.6	2.5		

*Standard size refers to having an external wall opening greater than or equal to 16 inches high or greater than or equal to 42 inches wide, and a cross-sectional area greater than or equal to 670 square inches.

**Non-standard size refers to having an external wall opening of less than 16 inches high or less than 42 inches wide, and a cross-sectional area less than 670 square inches.

Efficient Product Rebates
Commercial IT & Datacenter Rebate Guide

The following tables list the product requirements and rebates available for a range of energy-efficient IT and Datacenters products. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not purchased your products, your business may qualify for rebates in addition to those listed here.

Server-Based Power Management Software

Product	Criteria	Rebate
Server-Based Power Management Software	• Power management utility must be network-based • Must enable both monitor shut-down as well as computer sleep mode within 30 minutes of inactivity • Eligible systems must not allow user changes to individual computer power management settings • Both desktop and laptop computers are eligible • Installations on individual computers are not eligible • Eligible installations must not have existing power management software • Pre-approval mandatory	$10/ Computer

Server Virtualization & Decommissioning

Product	Criteria	Rebate
Server removal resulting from virtualization	• Removed servers must be properly disposed of and not be reused in any form • Removed servers must have been functional and in use prior to virtualization • New construction projects not eligible • Pre-approval mandatory	Determined on a project-by-project basis.

ENERGY STAR® Uninterruptible Power Supplies (UPS)

Product	Criteria	Rebate
Voltage and Frequency Independent (VFI), Voltage Independent (VI), Voltage and Frequency Dependent (VFD)	• Must be ENERGY STAR® certified • May be a retrofit or new construction installation • Pre-approval mandatory	Determined on a project-by-project basis.

Efficient Product Rebates
Commercial Kitchen Equipment Rebate Guide

The following tables list the product requirements and rebates available for energy-efficient commercial kitchen products. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Hot Food Holding Cabinets

Product	Interior Volume (ft^3)	Product Requirement	Rebate / ft^3
½ and ¾ size hot food holding cabinet	< 20	• ENERGY STAR® rated	$12
Full size hot food holding cabinet	≥ 20		$20

Low Temperature Dishwashers

Product	Product Requirements	Rebate
Under-Counter Dishwasher	• ENERGY STAR® rated • Building uses electrically heated water	$200
Single-Tank Door Type Dishwasher		$1,000
Single-Tank Conveyor Dishwasher		$800
Multi-Tank Conveyor Dishwasher		$1,100

High Temperature Dishwashers

Product	Product Requirements	Rebate
Under-Counter Dishwasher	• ENERGY STAR® rated • Built-in booster heater • Building uses electrically heated water • Dishwasher's hot water booster must be electric	$250
Single-Tank Door Type Dishwasher		$800
Single-Tank Conveyor Dishwasher		$700
Multi-Tank Conveyor Dishwasher		$1,500
Pot, Pan & Utensil Dishwasher		$200

Efficiency Nova Scotia has rebates of up to $1,000 available for converting from an electric to gas heated dishwasher; please contact us for more details.

Fryers

Product	Product Requirements	Rebate
Standard Capacity Electric Fryer	• ENERGY STAR® rated • MUST be replacing an electric fryer or a new installation	$500
Standard Capacity Gas Fryer	• ENERGY STAR® rated • MUST be replacing an electric fryer	$2,000

Griddles

Product	Product Requirements	Rebate
Electric Griddle	• ENERGY STAR® rated • MUST be replacing an electric griddle or a new installation	$150 / Linear Foot*
Gas Griddle	• ENERGY STAR® rated • MUST be replacing an electric griddle	$600/ Linear Foot*

*Width of griddle measured in linear feet. This metric can be found on a product specification sheet or the ENERGY STAR® Griddle Qualified Product List.

Steam Cookers

Product	Product Requirements	Rebate
Electric Steam Cooker	• ENERGY STAR® rated • MUST be replacing an electric steam cooker or a new installationn	$300 / Pan*
Gas Steam Cooker	• ENERGY STAR® rated • MUST be replacing an electric steam cooker	$600 / Pan*

*Pan Capacity is a common way to describe the size of a steam cooker. This metric can be found on a product specification sheet or the ENERGY STAR® Griddle Qualified Product List.

Ovens

Product	Size	Product Requirements	Rebate
Electric Convection Oven	Half or Full Size	• ENERGY STAR® rated • Idle Input rate less than 1.5kW • MUST be replacing electric convection oven or a new installation	$400
Gas Convection Oven	Half or Full Size	• ENERGY STAR® rated • MUST be replacing electric convection oven	$1,400
Electric Combination Oven	Half or Full Size	• ENERGY STAR® rated • MUST be replacing electric convection oven or a new installation	$1,000
Gas Combination Oven	Half or Full Size	• ENERGY STAR® rated • MUST be replacing electric combination oven	$2,000

Refrigerators

Eligible Product	Volume (ft^3)	Product Requirements	Rebate
Solid Door Refrigerator	ALL	• ENERGY STAR® rated • Standalone unit	$3 / ft^3
Glass Door Refrigerator	< 15	• ENERGY STAR® rated • Standalone unit • Replaces existing glass door refrigerator	$7 / ft^3
	≥ 15		$3 / ft^3

Freezers

Product	Volume (ft^3)	Product Requirements	Rebate
Solid Door Freezer	ALL	• ENERGY STAR® rated • Standalone unit	$6 / ft^3
Glass Door Freezer	< 15	• ENERGY STAR® rated • Standalone unit • Replaces existing glass door freezer	$20 / ft^3
	≥ 15		$12 / ft^3

Ice Makers

Product	Harvest Rate* (lb / day)	Product Requirements	Rebate
Ice Making Head	200-500	• ENERGY STAR® rated • Must be replacing non-ENERGY STAR® Ice Maker in retrofit applications	$80
	500-750		$145
	750-1000		$200
	> 1000		$250
Remote Condensing Unit	400-1000		$140
	1000-2000		$240
	>2000		$450
Self-Contained	ALL		$50

*Harvest Rate can be found on a product specification sheet or the ENERGY STAR® Ice maker Qualified Product List.

Kitchen Exhaust Demand Controlled Ventilation (DCV)

Product	Product Requirements	Rebate
Variable Speed Drive for Kitchen Exhaust Fans	• Controlled by temperature and/or optical sensors located in exhaust hood. • May be new construction or hood retrofit where DCV was not previously in place.	$500 / HP of exhaust fan

If you experience any difficulties finding the required values, contact Efficiency Nova Scotia for assistance prior to submitting your form.

Efficient Product Rebates
Commercial Laundry Rebate Guide

The following table list the product requirements and rebates available for energy-efficient commercial laundry products. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here

Commercial Washing Machines

Measure	Criteria	Rebate
ENERGY STAR® Washing Machine	• ENERGY STAR® rated • Building must use electrically heated water • Used for commercial purpose (units installed in individual apartments are not eligible for rebates)	$150
CEE Tier 2 Commercial Washing Machine	• Consortium for Energy Efficiency (CEE) Tier 2 listed • Building must use electrically heated water • Used for commercial purpose (units installed in individual apartments are not eligible for rebates)	$200
CEE Tier 3 Commercial Washing Machine	• Consortium for Energy Efficiency (CEE) Tier 3 listed • Building must use electrically heated water • Used for commercial purpose (units installed in individual apartments are not eligible for rebates)	$250

Commercial Clothes Dryers

Measure	Criteria	Rebate
Natural Gas Conversion of Electric Commercial Clothes Dryers	• Unit must replace an existing electric clothes dryer of similar capacity • Used for a commercial purpose • New construction projects are not eligible	$400
Heat Pump Clothes Dryer	• Minimum Combined Energy Factor (CEF) of 4.5 • ENERGY STAR® rated • Used for commercial purpose (units installed in individual apartments are not eligible for rebates) • Product must be offsetting electrical use	$300

Efficient Product Rebates
Commercial Lighting Rebate Guide

To meet rebate requirements, many measures must be ENERGY STAR® certified, and DesignLights Consortium® qualified. These lighting products provide high performance and value for your business.

Find ENERGY STAR® and DesignLights Consortium® qualified products at:
energystar.gov/products and **designlights.org/lighting-controls/download-the-qpl**

Projects replacing existing energy efficient lighting may not be available for rebates. Please contact us to confirm before you purchase and install your product.

Rebates that state availability as "in-store" have a rebate applied at the time of purchase at one of our participating distributor partners.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here. Receive project approval from Efficiency Nova Scotia before purchasing products in-store, to obtain additional rebates.

If product has already been purchased, additional rebates are not available on products marked as "in-store" The following tables list the product requirements and rebates available for energy-efficient commercial lighting products. For more information please visit our website **efficiencyns.ca/business**.

Indoor Lighting

Product	Availability	Criteria		Rebate
Decorative Lamp	**In-store**	• Includes common decorative shaped lamps such as chandelier and candle lamps • Must be ENERGY STAR® certified	All	$3
General Use Lamp	**In-store**	• Includes omnidirectional lamps such as A-lamps and globes • Must be ENERGY STAR® certified	All	$3
Reflector (Directional) Lamp	**In-store**	• Includes R, BR, MR, PAR lamp shapes • Must be ENERGY STAR® certified	Small (≤ 20)	$5
			Large (> 20)	$6

Product	Availability	Criteria		Rebate
Downlight Luminaire	In-store	• Includes recessed luminaires, ceiling mounted luminaires, surface mounted luminaires, pendant luminaires, inseparable solid state luminaires, downlight solid state retrofit kit • Includes fixtures with integrated occupancy sensors • Must be ENERGY STAR® certified	400 – 999 lm	$8
			1,000 – 2,999 lm	$12
			≥ 3,000 lm	$15
LED Wall Sconces	In-store	• Includes wall sconces and retrofit kits • Must be ENERGY STAR® certified	400 – 999 lm	$10
			1,000 – 2,999 lm	$18
			≥ 3,000 lm	$30
High-bay Luminaire (DLC Premium)	Mail-in	• Includes high-bay aisle luminaires and high-bay luminaires for commercial and industrial buildings • Must be qualified as a DLC premium product	10,000 – 19,999 lm	$130
			20,000 – 29,999 lm	$200
			30,000 – 39,999 lm	$300
			40,000 – 54,999 lm	$400
			≥ 55,000 lm	$550
High-bay Luminaire (DLC Standard)	Mail-in	• Includes high-bay aisle luminaires and high-bay luminaires for commercial and industrial buildings • Must be DLC qualified	10,000 – 19,999 lm	$100
			20,000 – 29,999 lm	$160
			30,000 – 39,999 lm	$240
			40,000 – 54,999 lm	$320
			≥ 55,000 lm	$440
Low-bay Luminaire	In-store	• Includes low-bay luminaires for commercial and industrial buildings and retrofit kits • Must be DLC qualified	5,000 – 9,999 lm	$30
			≥ 10,000 lm	$50
Stairwell and Passageway Luminaire	Mail-in	• Must be replacing non-dimmable stairwell and passageway fixture • Must be able to dim to < 25% of full output when no occupants are detected • Must be in operation 24 hours/7 days a week • Must be DLC qualified	All	$55
1x1 Troffer	In-store	• Includes luminaires for ambient lighting of interior commercial spaces and retrofit kits • Must be DLC qualified	All	$10
1x2 Troffer				$10
1x4 Troffer				$25
2x2 Troffer				$25
2x4 Troffer				$30

Product	Availability	Criteria		Rebate
Linear Ambient Luminaire	In-store	• Includes direct linear ambient luminaires, linear ambient luminaires with indirect component, strip/wrap lighting and retrofit kits • Must be DLC qualified	≤ 2,499 lm	$10
			2,500 – 4,999 lm	$15
			5,000 – 9,999 lm	$30
			≥ 10,000 lm	$50
Refrigerated Case Luminaire	Mail-in	• Includes both horizontal refrigerated case luminaires and vertical refrigerated case luminaires installed in refrigerators and freezers • Must be DLC qualified	All	$6 / ft
Wall-wash Luminaire	In-store	• Includes luminaires that illuminate walls in interior spaces • Must be DLC qualified	575 – 1,199 lm	$10
			≥ 1,200 lm	$20
Track or Mono-point Direction Luminaire/Accent Light Line Voltage	In-store	• Includes ceiling-mounted tracks or fixed single head • Replacement lamps not eligible (such as PAR38) • Must be DLC qualified or ENERGY STAR® certified	All	$15 / head
Four Pin-Base Replacement Lamps for CFLs	Mail-in	• Designed to replace four-pin compact fluorescent lamps including: horizontal, vertical and 2G11 lamps • Must be DLC qualified	All	$5
Linear Replacement Lamp	In-store	• Designed to replace T5/T8/T12 fluorescent lamps • Must be DLC qualified	2 foot	$2.50
			3 foot	$3
			4 foot	$4
			8 foot	$6
			U-Bend	$5

Outdoor Lighting

Product	Availability	Criteria		Rebate
Wall-Mounted Area Luminaire (Full-Cutoff)	In-store	• Includes outdoor full-cutoff wall-mounted area luminaires and retrofit kits • Must be DLC qualified	300 – 1,999 lm	$15
			2,000 – 4,999 lm	$30
			5,000 – 14,999 lm	$60
			15,000 – 24,999 lm	$100
			≥ 25,000 lm	$200

Product	Availability	Criteria		Rebate
Wall-Mounted Area Luminaire (Non-Cutoff and Semi-Cutoff)	Mail-in	• Includes outdoor non-cutoff and semi-cutoff wall-mounted area luminaires • Must be DLC qualified	300 – 1,999 lm	$15
			2,000 – 4,999 lm	$30
			5,000 – 14,999 lm	$60
			15,000 – 24,999 lm	$100
			≥ 25,000 lm	$200
Flood and Spot Luminaires	In-store	• Includes landscape/accent flood and spot luminaires landscape, and architectural flood and spot luminaires and retrofit kits • Must be DLC qualified	250 – 999 lm	$15
			1,000 – 4,999 lm	$30
			5,000 – 14,999 lm	$100
			15,000 – 24,999 lm	$200
			30,000 – 49,999 lm	$400
			≥ 50,000 lm	$600
Pole/Arm–Mounted Area Luminaire	Mail-in	• Includes outdoor pole/arm-mounted area luminaires and retrofit kits • Roadway lighting not eligible • Must be DLC qualified	1,000 – 4,999 lm	$25
			5,000 – 9,999 lm	$60
			10,000 – 24,999 lm	$160
			25,000 – 39,999 lm	$300
			40,000 – 54,999 lm	$350
			≥ 55,000 lm	$500
Pole/Arm–Mounted Decorative Luminaire	Mail-in	• Includes outdoor pole/arm-mounted decorative luminaires and retrofit kits • Must be DLC qualified	1,000 – 1,999 lm	$60
			2,000 – 5,499 lm	$75
			≥ 5,500 lm	$150
Parking Garage Luminaire	Mail-in	• Includes parking garage luminaires and retrofit kits • Must be DLC qualified	2,000 – 6,499 lm	$100
			≥ 6,500 lm	$150
Fuel Pump Canopy Luminaire	Mail-in	• Includes fuel pump canopy luminaires and retrofit kits • Must be DLC qualified	2,000 – 6,999 lm	$80
			≥ 7,000 lm	$150
LED Replacement Lamps for HID Lamps	Mail-in	• Designed to replace high intensity discharge lamps • New construction projects are not eligible (retrofit only) • Roadway lighting are not eligible • Must be DLC qualified	250 – 4,999 lm	$20
			5,000 – 9,999 lm	$40
			≥ 10,000 lm	$60

Product	Availability	Criteria	Rebate
Case Lighting for Sign Retrofit Applications	Mail-in	• Minimum three year warranty • Minimum 60 lumens per watt • Undergone IES testing (LM-79 and LM-80 or equivalent) • New construction projects are not eligible (retrofit only) • Include pictures clearly showing the new LED case lighting installed in the sign	$2.50 / ft

Lighting Controls

Product	Availability	Criteria	Rebate
Occupancy Sensor - Wall-Switch or Fixture Mounted	In-store	• For use with LED or fluorescent systems • The use of a program start ballast is recommended for fluorescent systems • Excludes ENERGY STAR® certified or DLC approved fixtures with integrated occupancy sensors	$20
Occupancy Sensor - Ceiling or Wall Remote Mounted			$50
Occupancy Sensor - Exterior	In-store	• Fixture must automatically shut off during the day by using a timer, photo-sensor or similar technology • For use with LED or fluorescent systems • The use of a program start ballast is recommended for fluorescent systems	$10
Daylighting Controls - Wall-Switch or Fixture Mounted	Mail-in	• System commissioning is strongly recommended to ensure maximum energy savings • For indoor use only	$10
Daylighting Controls - Ceiling or Wall Remote Mounted			$30

Efficient Product Rebates
Commercial Pool Equipment Rebate Guide

The following table lists the product requirements and rebates available for energy-efficient commercial pool products. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Pool Pumps

Product	Criteria	Rebate
Pool Pump	• Must be a current ENERGY STAR® certified multi-speed, variableflow, or variable-speed pump • Must be replacing a single-speed pool pump • For new construction projects, please contact us before submitting your application. • Recommend installation done and commissioned by a pool system contractor	$350

Efficient Product Rebates
Commercial Pumping Equipment Rebate Guide

The following table lists the product requirements and rebates available for a range of energy efficient pumping technologies. For more information on where to purchase rebated products please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

High Efficiency Circulator Pump

Product	Availability	Max Power Input (Watts)	Product Requirements	Rebate
High Efficiency Circulator Pump	In-store	< 150W	• Utilizes permanent magnet motor • Contains integral variable speed drive (VFD) which automatically powers,based on system demand.	$60
		150 to 499W		$110
		500 to 2,500W		$400

Efficient Product Rebates
Commercial Refrigeration Rebate Guide

The following tables list the product requirements and rebates available for energy efficient commercial refrigeration products. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Refrigeration

Product	Product Requirements	Rebate
Strip-curtains for display cases	PVC, metal or equivalent curtains installed on open, multi-deck coolers are eligible for rebates.	$8/linear ft
Cooler night covers for display cases	PVC, metal or equivalent covers installed on open, multi-deck coolers are eligible for rebates.	$8/linear ft
Open to closed cooler conversion	• Open multi-deck coolers that are replaced by doored units are eligible for this rebate. • New construction projects are not eligible.	$25/linear ft
Zero-energy doors for reach-in coolers	• Reach-in display case doors must be highly insulated, double or triple pane units with low-E glass coatings or low-conductivity filler gas (argon). • Door frames with electric resistance heating (heaters in door or frames) are not eligible.	$120/door
Door heater controls	Humidity or conductivity based heater controls that limit heater operation to periods of high relative humidity (when condensation is likely to form) are eligible for rebates.	$80/door controller
Evaporator fan motor controls	The control system: • Controls a minimum of 300 Watts or four evaporator fans. • Reduces evaporator fan air flow by at least 50% when the compressor is not running or when no refrigerant is flowing through the evaporator. Note: this measure may not result in significant energy savings if the system is under-sized or if the evaporator does not use off-cycle or time-off defrost.	$500/controller
Intelligent freezer defrost controls	• The control system contains temperature and pressure sensors to monitor system operation and determine if there is a need to run a defrost cycle. • Each controller controls the defrost cycle of three or more evaporator fans. • Walk-in freezer evaporator coils with electric defrost only (medium and high temperature coolers not eligible).	$150/controller

Product	Product Requirements	Rebate
Outside air economizer	• Coolers must be capable of drawing in outdoor air when it is sufficiently cool (temperatures less than 34°F or 1°C). • Outdoor air and exhaust dampers must close automatically for summer isolation. Note: Walk-in coolers smaller than 1,000 cubic feet are not eligible for rebates.	$2,000/ economizer
Refrigerated vending machine controls	Controller uses occupancy sensor based controls to de-energize refrigerated vending machines when the surrounding area is not occupied.	$50/controller
Discus or scroll refrigeration compressor	• Efficient discus or scroll compressor must be new construction or replacing a hermetic or semihermetic compressor. • Compressors utilizing R22 refrigerant are not eligible.	$200

Electronically Commutated (Brushless) DC Motors for Refrigeration Evaporator Fan Applications*

Product	Product Requirements	Rebate
Walk-in cooler	Minimum nameplate hp of 1/20	$180
Standalone retail cooler	Minimum nameplate hp of 1/100	$60

*New motors that operate at least 2,000 hours a year are eligible for rebate.

Cooler Temperature Guide

Temperature Class	Temperature Range (°F)	Temperature Range (°C)
Low temperature (LT)	< 25 °F	< -4 °C
Medium temperature (MT)	25 – 40 °F	-4 – 4 °C
High temperature (HT)	41 – 65 °F	5 – 18 °C

Related Measures:

ENERGY STAR® certified ice machines and standalone reach-in refrigerators and freezers can be found in the Kitchens Application.

LED case lighting for refrigerators and freezers can be found in the Lighting Application.

Efficient Product Rebates
Commercial Solar Rebate Guide

The following table lists the product requirements and rebates available for energy-efficient commercial solar thermal products. For more informatio please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Product	Criteria	Rebate
Solar domestic hot water (DHW) systems. Solar space heating systems.	• Energy analysis must be submitted with application. • Rebates are only available for projects that off-set electricity. Application must be approved prior to the purchase or installation of any solar equipment. • Must be CSA approved. • Application must be approved prior to the purchase or installation of any solar equipment.	Determined on a project-by-project basis. Maximum of $500 per panel.

Your energy analysis can be obtained from your contractor. RETScreen is Efficiency Nova Scotia's preferred modelling software.

Efficient Product Rebates
Commercial VFD Rebate Guide

The following table lists the rebates available for energy efficient Variable Frequency Drive (VFD) technologies. For more information please visit our website **efficiencyns.ca**.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

To qualify for a rebate, the VFD will be used in one of the following applications:

- Supply Fan
- Return Fan
- Exhaust Fan
- Make-up Air Fan
- Cooling Tower Fan
- Boiler Draft Fan (≤ 10 hp)
- Chilled Water Pump
- Condenser Pump
- Boiler Feed Water Pump
- Hot Water Circulating Loop Pump

Variable Frequency Drives (VFD)

Motor Horsepower (hp) Controlled	Requirements	Rebate
1 – 3 hp	• Applications up to 40 hp are eligible for rebates (up to 10 hp for boiler draft fans). • VFDs controlled automatically by differential pressure flow or temperatures are eligible for rebates. • VFDs must be new and not replacing existing VFDs. • Redundant (back-up) systems are not eligible for rebates. • A minimum 3 per cent series reactor (inductor, choke) is recommended on the drive AC input connections (ask your supplier for more information). • VFDs that control forward-curve fans with inlet guide vanes or variable pitch vane-axial fans are not eligible for rebates. • Must operate at least 2,000 hours per year.	$500
5 hp		$750
7.5 hp		$1,000
10 hp		$1,200
15 hp		$1,500
25 hp		$2,500
30 hp		$3,000
40 hp		$4,000

Efficient Product Rebates
Commercial Water Heating Rebate Guide

The following table lists the product requirements and rebates available for energy-efficient commercial water heating products. For more information please visit our website **efficiencyns.ca**.

If you are installing a split system (i.e. a system with an outdoor unit) for water heating, space heating or both, please use the heating worksheet and rebate guide.

If your utility bill is less than $3,800 monthly and you have not yet purchased your products, your business may qualify for rebates in addition to those listed here.

Heat Pump Water Heating

Measure	Criteria*	Rebate
≤ 40 gal and < 60 gal	• Energy Factor EF > 2.3 • Installation in electrically heated spaces not eligible for incentives	$600
≤ 80 gal and < 60 gal	• Existing system must be an electric hot water system • Approval required before purchasing	$700
≥ 80 gal and above	• Product must be CSA approved or equivalent certification for Canada • Other conditions may apply, please contact Efficiency Nova Scotia for more details.	$800

Natural Gas Water Heating

Measure	Criteria*	Rebate
≤ 40 gal and < 60 gal	• Existing system must be an electric hot water system • Approval required before purchasing • Proposed water heating system must be CSA approved or equivalent certification for Canada • Other conditions may apply, please contact Efficiency Nova Scotia for more details.	$600
≤ 80 gal and < 60 gal		$700
≥ 80 gal and above		$800

NON-CONFIDENTIAL

Request IR-16:

With regard to the Small Business Energy Study (SBES) completed in 2017:

a) Please provide the recent version of the SBES study.

b) Please list any marketing and process improvements identified in the SBES study has already been implemented by EfficiencyOne.

c) Please provide detail information if EfficiencyOne is planning to incorporate the findings of Small Business Study in the proposed 2019 DSM Plan.

Response IR-16:

a) Please refer to Attachments 1 and 2 of this IR response for the Small Business Energy Study. This is the same version that was provided in 2017.

Attachment 1 provides Corporate Research Associates' Small Business Research Report (Part I of the Study). Attachment 2 provides EfficiencyOne's internally developed report on programs applicable to small businesses, outreach initiatives, and responses to CRA's recommendations (Part II of the Study).

b) CRA recommended that EfficiencyOne take steps to build greater awareness of the Small Business Energy Solutions and Business Energy Rebates programs. EfficiencyOne followed up on this recommendation by working to increase small businesses' awareness of its programs through outreach, presentations, and engagement in 2017 and 2018. EfficiencyOne profiled small business participants for success stories that are included in outreach materials, recognizing that sharing these experiences is a valuable way to raise awareness of energy efficiency.

The Small Business Energy Study did not specifically identify process improvements. Participation Barriers and Mitigation Strategies are, however, captured in Part II of the Study, and have detailed descriptions under Table 1: SBES Participation Barriers and

NON-CONFIDENTIAL

Mitigation Strategies and Table 3: BER Participation Barriers and Mitigation Strategies. Since articulating these participation barriers and mitigation strategies, EfficiencyOne has continued to enact the strategies as described.

c) EfficiencyOne continues to promote and seeks to grow offerings targeted towards small businesses. The Small Business Energy Study provided valuable insight to help EfficiencyOne support its small business customers and will continue to inform EfficiencyOne's understanding of small business needs, including in 2019.

EfficiencyOne will continue to work towards increasing small businesses' awareness of its programs. EfficiencyOne will continue to profile small businesses who have participated in its programs to highlight success stories and raise awareness of energy efficiency. EfficiencyOne will continue to work with companies and organizations who engage with small businesses to help provide accurate information on Small Business Energy Solutions and Business Energy Rebates.

Small Business Energy Efficiency Research

Final Report

Prepared for:

Efficiency Nova Scotia

March 2017

CRA CORPORATE RESEARCH ASSOCIATES
www.cra.ca
1-888-414-1336

Marketing Research and Intelligence Association
Accredited Gold Seal Corporate Member
MRIA AMRIQ
Association de la Recherche et de l'Intelligence Marketing

Table of Contents

Page

Introduction **1**

Executive Summary **2**

Conclusions **4**

Recommendations **7**

Detailed Analysis **8**

Incidence of ENS Program Participation **8**

ENS Program Non-Participants **9**

ENS Program Participants **15**

Joint Analysis of Participant and Non-Participant Organizations **26**

Study Methodology **28**

Appendices:

Appendix A – Study Questionnaire

Appendix B – Tabular Results

Introduction

The Request for Proposals (RFP) for this study indicated that Efficiency Nova Scotia (ENS) offers several programs that target, among others, small businesses in the province, and that are designed to assist program participants to reduce their electricity use. These programs are Direct Installation (marketed as Small Business Energy Solutions and, before that, Business Energy Solutions) and Efficient Product Rebates (Business Energy Rebates).

The RFP further imparts that improving the understanding of potential small business customers' energy efficiency needs, preferences, barriers, motivations and challenges will provide business intelligence to inform ENS decisions about program features and marketing strategies and tactics, to ensure small business needs are fully understood and considered. As a result, ENS commissioned the current research project to better understand the behaviours, needs, and expectations of small business organizations in the province.

Research Objectives

To articulate the overarching research objective at the highest level, the purpose of the research catalogued in this report was to better understand the motivations and barriers confronting small businesses as they decide whether or not to participate in the programs offered by ENS. In an overall sense, the research aimed to provide insight into why small businesses do or do not participate in energy efficiency programs. More specifically the research explored the following questions:

- *What are the costs to program Participants and what are the benefits?*
- *What encourages participation? How did organizations benefit from the ENS programs?*
- *What are the barriers to program participation?*
- *Would organizations participate again if they could – what was their experience?*

Research Target Population

As delineated in the RFP, the target population of this research was those small businesses that either have or have not participated in Small Business Energy Solutions, Business Energy Solutions, or Business Energy Rebates' Mail-in service since 2011, with annual electricity use of less than 150,000 kilowatt hours (kWh), and with a Nova Scotia Power electricity account rate code of 10, 11, or 21. Nova Scotia Power (NSP) contact information concerning organizations in these three rate codes permitted a random sampling of these codes. The implication of having this sampling frame was the ability to determine the incidence of participation in ENS's business programs, among organizations in these three targeted NSP rate codes.

In total, 250 telephone-based interviews were conducted with ENS small business Participants, and an additional 250 telephone-based interviews were conducted with ENS small business Non-Participants. Data collection occurred from January 30 to March 3, 2017.

Executive Summary

The 2017 ***Small Business Energy Efficiency Research*** study commissioned by Efficiency Nova Scotia (ENS) provides insight into awareness of the organization's program offerings for small businesses, program participation, and program outcomes among small businesses in Nova Scotia. Using random probability sampling of small businesses with a Nova Scotia Power (NSP) rate code of 10, 11, or 21, the study was undertaken as two discrete components: ENS program Participant organizations, and ENS program Non-Participant organizations. The research reveals that one-quarter of NSP small business client organizations with these rate codes can be classified as ENS program Participant organizations, while the remaining three-quarters can be classified as ENS program Non-Participant organizations. These two groups were sampled and studied separately to gain insight into a variety of subjects from the two distinct perspectives.

Among **Non-Participants**, it was determined that two-thirds had lighting equipment installed or replaced between 2011 and 2016 at one or more of their business locations, suggesting that maintaining up-to-date equipment is an important aspect of business operations for many of these organizations. Despite this perceived importance and nearly all Non-Participants reporting awareness of Efficiency Nova Scotia as an organization, only a smaller majority of these organizations indicate that they were specifically aware of the programs available to small businesses in the province.

Of the Non-Participant organizations aware of the ENS business programs, word of mouth communication ranked as the most common source of awareness. There exists an opportunity to heighten participation through improved communication of information to small businesses. For example, many Non-Participants who are aware of the ENS programs generally, also nonetheless relate that they are unaware of specific program details.

Although a majority of Non-Participants are aware of ENS business programs, only a minority of such organizations have considered taking part in an ENS program, with the predominant reason for considering participation being potential energy savings or power bill reductions. If heightened levels of awareness among small businesses in Nova Scotia could be achieved, the ENS program participation level has the potential to increase, as a majority of organizations indicate that they would participate in the future, coupled with the fact that nearly all Non-Participants hold a favourable overall opinion of Efficiency Nova Scotia.

Among **Participants**, it is widely agreed that energy savings and power bill reductions are the main reasons for small business participation and the main benefit of taking part in ENS's business programs. The future prospects of repeat participation by these organizations are rosy, as the majority of Participants did not experience any challenges while taking part in an ENS program, and nearly all organizations indicate they would participate again in the future.

This optimism is reinforced by the fact that a majority of Participants received reductions in their energy use as a result of Efficiency Nova Scotia business program participation, while a separate majority observed reductions in their electricity bills. Of those who received reductions in each regard, the vast majority found the reductions were similar in size to their expectations, with less than ten percent of such Participants reporting reductions that were less than expected. Perhaps not surprisingly, these positive results led to nearly all Participants indicating that they would recommend ENS programs to other companies, and to widespread favourable overall opinions of Efficiency Nova Scotia.

Conclusions

The following conclusions are drawn from the detailed analysis of the study's findings:

One-quarter of small businesses report having participated in an Efficiency Nova Scotia business program.

Using random probability sampling of small businesses with a Nova Scotia Power rate code of 10, 11, or 21, the overall incidence of Efficiency Nova Scotia program participation was determined. The research indicates that fully one-quarter of organizations with one of the aforementioned rate codes can be classified as ENS Program Participants, while the remaining three-quarters are classified as Non-Participants. Program incidence was found to be more prevalent among organizations in rate codes 11 and 21.

Non-Participant Organizations

A small majority of Non-Participant companies are aware of Efficiency Nova Scotia business programs, with word of mouth communication representing the most common source of awareness.

Prior to this study, a small majority of Non-Participants (56%) had heard of Efficiency Nova Scotia's business programs. The most common source of awareness among Non-Participants is word of mouth communication, followed by media advertising. In terms of overall awareness of Efficiency Nova Scotia as an organization, nearly all Non-Participants report having heard of the organization. Among those that did not report awareness of ENS programs, the vast majority nonetheless indicated awareness of Efficiency Nova Scotia.

Despite only a minority of Non-Participants having previously considered participation in an Efficiency Nova Scotia business program, seven in ten organizations would likely participate in such a program in the future.

Among Non-Participant organizations that report awareness of ENS programs, one-third have considered participation, with energy savings or power bill reductions stated as the most important reason for consideration. In addition, many Non-Participants that did not report awareness of ENS programs stated that their non-participation was due to not being aware of program details. With regards to *future* participation, seven in ten Non-Participants would take part in an Efficiency Nova Scotia business program in the future.

Although familiarity with Efficiency Nova Scotia programs is low, nearly all Non-Participants aware of the programs offer a favourable opinion of the organization.

Overall, three in ten Non-Participant organizations report familiarity with Efficiency Nova Scotia's business programs. Despite this relatively low level of familiarity, nine in ten organizations offer a favourable overall opinion of Efficiency Nova Scotia, with seven in ten Non-Participants reporting a *mostly favourable* opinion and two in ten offering a *completely favourable* opinion.

Participant Organizations

The vast majority of Participant organizations made the decision to participate in an Efficiency Nova Scotia business program so as to save energy or reduce their power bill.

In terms of sources of program awareness, Participant organizations most commonly indicate first learning about Efficiency Nova Scotia business programs either through contact from ENS (20%), or through word of mouth communication (18%). As was the case for consideration among Non-Participants, a desire to save energy or reduce power bills is the most frequently mentioned reason Participant organizations chose to take part in an ENS program. It is also positive to note that a majority of Participants did not experience any challenges in participating in an Efficiency Nova Scotia business program. With regards to future participation, nearly all Participants would take part in an Efficiency Nova Scotia business program in the future.

A modest majority of Participant organizations observed reductions in energy use and experienced a reduction in their power bill, as a result of their ENS business program participation.

With regards to outcomes arising from participation in an Efficiency Nova Scotia business program, seven in ten Participants report a reduction in energy use, while six in ten indicate that there was a reduction in their electricity bill. In addition, the vast majority of Participants (82%) believe the reduction in energy use was about as expected, with a similar number of organizations reporting that electricity bills reductions were consistent with expectations. In terms of other outcomes resulting from program participation, six in ten organizations report having closely monitored energy consumption after taking part in an Efficiency Nova Scotia business program.

Nearly all Participant organizations would recommend Efficiency Nova Scotia business programs to other companies.

Nearly all Participant organizations would recommend ENS business programs to other companies, with six in ten stating they would *definitely* recommend, and three in ten indicating that they would *probably* recommend. Among the four in ten Participants that did not state they would *definitely* recommend Efficiency Nova Scotia programs, a variety of means that would improve their likelihood to recommend were suggested. These methods include better savings, more information, more benefits to companies, improved incentives or rebates, and easier processing or implementation.

Most Participant organizations only infrequently promote their energy efficiency in communications and marketing, with nearly one-half never promoting energy efficiency.

Promoting energy efficiency in communications or marketing is uncommon among Participant organizations, as only one in seven report either *always* or *usually* doing so. The majority of Participant organizations either *rarely* or *never* promote energy efficiency in communications or marketing. Organizations that are less inclined to participate in ENS programs or recommend programs to other companies, are also less likely to promote their energy efficiency.

Favourable overall opinions of Efficiency Nova Scotia are widespread among Participant organizations.

Nearly all Participant organizations offer a favourable overall opinion of Efficiency Nova Scotia, with two-thirds indicating a *mostly favourable* opinion and three in ten reporting a *completely favourable* opinion. Participants that are more inclined to have a *completely favourable* opinion of Efficiency Nova Scotia include those with six or more full-time employees, organizations that would recommend programs to other companies, and those that would *definitely* participate in programs in the future.

Recommendations

The following recommendations are drawn from the conclusions of this study and are offered for the consideration of Efficiency Nova Scotia:

1. ***Efficiency Nova Scotia should take steps to build greater awareness of Small Business Energy Solutions and Business Energy Rebates.***

   Despite the fact that ENS has been in existence only a few years, the research indicates there already is an admirable level of program participation by companies in the targeted small business rate codes. Nonetheless, there remains an opportunity for ENS to build greater awareness of Small Business Energy Solutions and Business Energy Rebates, with the attendant goal to augment program participation among small businesses to still higher levels. This opportunity is particularly evident given that there already exists widespread and favourable awareness and opinion regarding ENS, together with a clear desire on the part of NS companies to enhance the energy efficiency of their business locations. The key 'missing link' is heightened corporate awareness of relevant ENS business programs. ENS's media strategy should be considered in light of the current research indicating that many Participant and Non-Participant organizations first learned of ENS business programs through word of mouth rather than sources such as media advertising, the Internet, and social media. This recommendation is also formed on the basis of many Non-Participant organizations citing a lack of awareness and information as the main reasons for not participating in ENS programs, while only a minority of such organizations report heightened familiarity with the programs offered.

2. ***Efficiency Nova Scotia should utilize the study results to highlight program participation benefits for potential participants.***

   As an extension of the above recommendation specifically focused upon increased program awareness, there also exists an opportunity to utilize the study results to highlight program participation benefits for potential participants. The survey results gleaned from Participant organizations indicate that a majority of these companies observed a reduction in their energy use and electricity bills. These findings identify concrete and pivotal benefits of program participation, and point toward a powerful message to entice other organizations to consider participation.

3. ***ENS should recommend that program Participant companies reference their energy efficiency practices in future communications and marketing materials.***

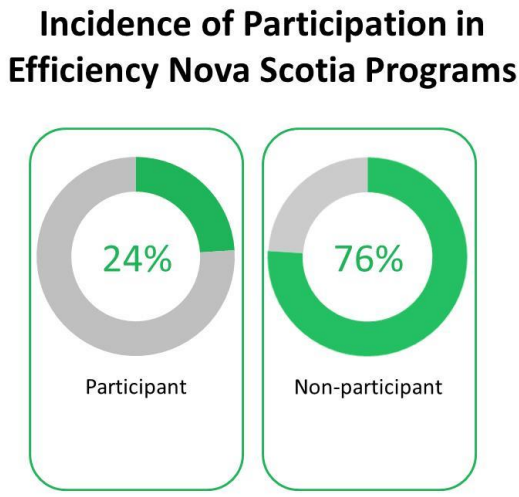
   The survey results suggest an opportunity for ENS to recommend to program Participant organizations that they promote their energy efficiency practices in their communications and marketing efforts. As it stands, the majority of Participants rarely or never promote energy efficiency, thereby identifying an opportunity for ENS to embed a standardized program exit pitch to its clients to include energy efficiency as a focus in future communications and marketing efforts. Increased promotion of energy efficiency may allow Participant organizations to differentiate themselves from their competition, while also acting as a promotional tool for ENS business programs.

Detailed Analysis

Incidence of ENS Program Participation

One-quarter of small businesses report having participated in an Efficiency Nova Scotia business program.

The overall incidence of Efficiency Nova Scotia (ENS) program participation among small businesses with a Nova Scotia Power rate code of 10, 11, or 21, was determined via a random probability sampling of these businesses. Results indicate that one-quarter (24%) of organizations with one of these rate codes can be classified as ENS Program Participants, while the remaining three-quarters (76%) can be classified as Non-Participants. (Tables 8 and 9 Combined)



Incidence of participation in ENS programs. Derived from survey questions Q.8 and Q.9. Participant: Code 1 ('Yes, has participated in one or more of these programs') in Q.9, or Code 7 ('Did participate, but unsure which one') in Q.9. Non-Participant: Code 2 ('No, did not participate prior to 2017') in Q.8, or Code 8 ('Don't know/No answer') in Q.8, or Code 2 ('No, has not participated in any of these programs') in Q.9, or Code 8 ('Don't know/No answer') in Q.9. (n=355)

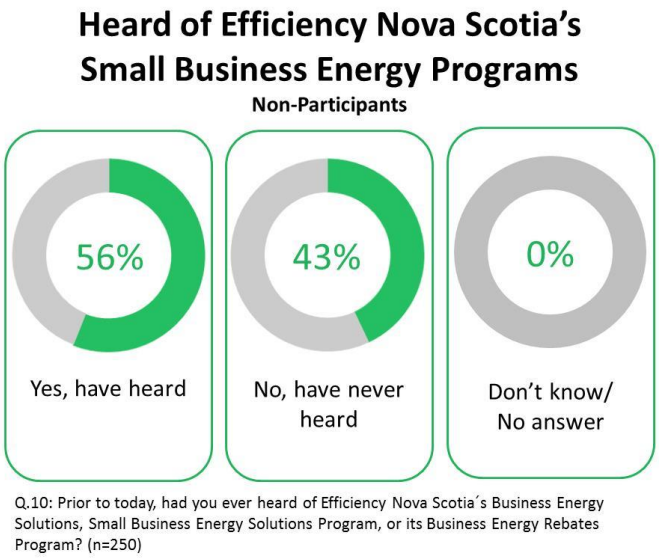
Participation in Efficiency Nova Scotia programs is generally consistent across the Nova Scotia Power service regions in the province. Of note, organizations that fall under the Nova Scotia Power Inc. rate codes 11 and 21 are more likely to be Participants, as compared to organizations with rate code 10. In addition, organizations with six or more full-time employees, along with those that have had lighting equipment installed or replaced between 2011 and 2016, are more likely to be classified as Efficiency Nova Scotia business program participants.

ENS Program Non-Participants

Program Awareness

A small majority of Non-Participant companies are aware of Efficiency Nova Scotia business programs, with word of mouth communication representing the most common source of awareness.

Prior to this study, just under six in ten (56%) Non-Participant organizations had heard of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions, or Business Energy Rebates program components. (Table 10)



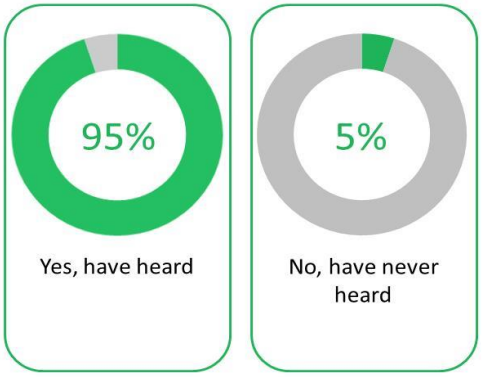
Q.10: Prior to today, had you ever heard of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program? (n=250)

Awareness of these various Efficiency Nova Scotia business program components is similar across the province. Meanwhile, Non-Participant organizations with six or more full-time employees, along with those reporting familiarity with Efficiency Nova Scotia overall, are more likely to have heard of these program components offered by Efficiency Nova Scotia.

Overall Organization Awareness

Across all Non-Participant organizations, awareness of Efficiency Nova Scotia is widespread. Nearly all organizations (95%) report having heard of Efficiency Nova Scotia prior to this study. Among the Non-Participant organizations that did not report specific awareness of Efficiency Nova Scotia's business programs, the vast majority (89%) indicate awareness of Efficiency Nova Scotia overall. (Table 10a Total Sample)

Heard of Efficiency Nova Scotia



Q.10a: [TOTAL SAMPLE] Prior to today, had you ever heard of Efficiency Nova Scotia? (n=250)

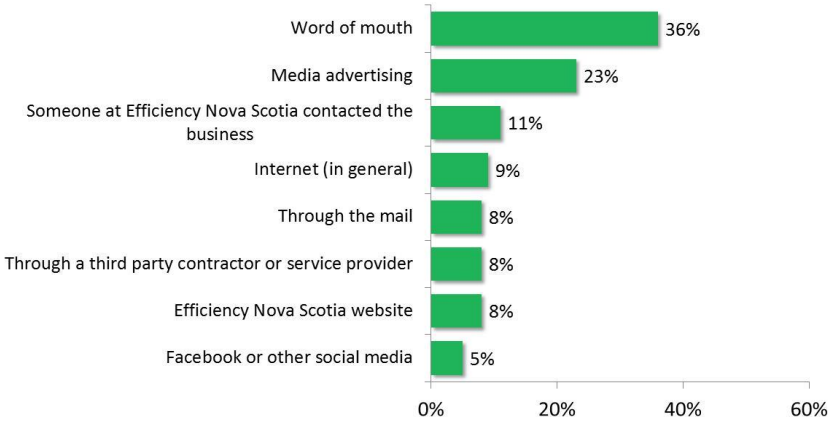
Source of Program Awareness

Among those Non-Participant organizations that had heard of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions, or Business Energy Rebates program components, a variety of sources of awareness were mentioned. Specifically, just under four in ten (36%) organizations cited ***word of mouth***, while ***media advertising*** was reported by one-quarter (23%) of Non-Participant organizations. Other sources mentioned include ***someone at Efficiency Nova Scotia*** (11%), ***the Internet*** (9%), ***through the mail*** (8%), ***through a third party contractor or service provider*** (8%), and ***the Efficiency Nova Scotia website*** (8%).

In addition, ***Facebook or another social media platform*** (5%) was reported as another source of information for Efficiency Nova Scotia's programs. (Table 11)

Source of Program Awareness

Among Those Who Had Heard of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program
Key Mentions From Total Unaided Mentions
Non-Participants



Q.11: **[ASK IF 'YES' IN Q10]** How did your business first learn of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program? (n=143)

Across the province, ***word of mouth*** is the most common source of information for the Efficiency Nova Scotia programs in the Central and Western regions of province, while ***media advertising*** is most prominent in Eastern Nova Scotia.

Program Participation

Despite only a minority of Non-Participants having previously considered participation in an Efficiency Nova Scotia business program, seven in ten organizations would likely participate in such a program in the future.

Program Consideration

Among those Non-Participant organizations that had heard of Efficiency Nova Scotia's business programs, one-third (35%) relate that at some point in the past they have considered participating in a business energy efficiency program offered by Efficiency Nova Scotia. (Table 12)

Considered Participating in Business Energy Efficiency Programs Offered by Efficiency Nova Scotia

Among Those Who Had Heard of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program Non-Participants

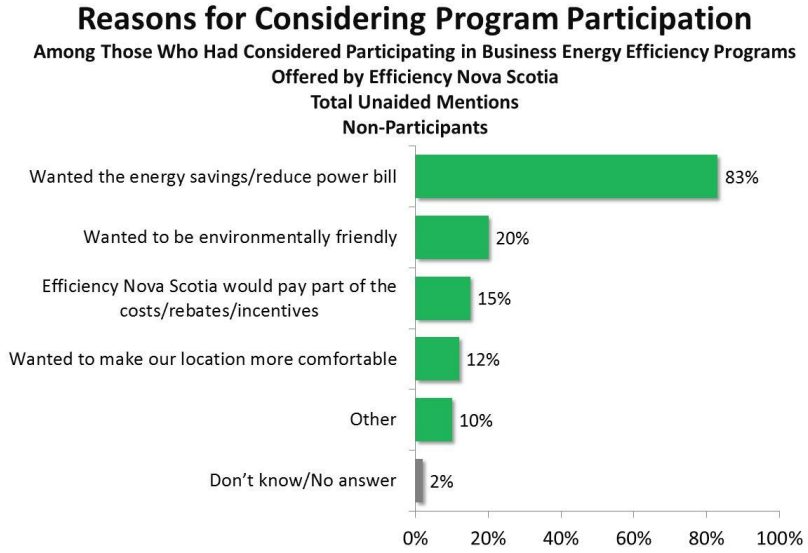


Q.12: **[ASK IF 'YES' IN Q.10 OR Q.10a]** Has your company ever considered participating in the business energy efficiency programs offered by Efficiency Nova Scotia? (n=239)

It is important to note that Non-Participant organizations with a Nova Scotia Power Inc. rate code of either 11 or 21, are more likely to have considered participating in the business energy efficiency programs offered by Efficiency Nova Scotia. In addition, likelihood of considering participation is higher among Non-Participant organizations with six or more full-time employees, as well as those familiar with Efficiency Nova Scotia overall, and those specifically aware of Efficiency Nova Scotia's business programs.

Reasons for Consideration

Among those Non-Participant companies that had considered participating in a business energy efficiency program offered by Efficiency Nova Scotia, the vast majority (83%) mention as the single most important reason for considering participation the fact that they sought ***energy savings or a reduction in their power bill***. Other notable reasons for considering program participation include ***wanting to be environmentally friendly*** (20%), ***Efficiency Nova Scotia paying for part of the costs, rebates, or incentives*** (15%), and ***wanting to make their location more comfortable*** (12%). (Table 13)



Q.13: **[ASK IF 'YES' IN Q.12]** What is the single most important reason why your company considered participating in Efficiency Nova Scotia's Small Business Energy Solutions, Business Energy Solutions or Business Energy Rebates business programs? (n=91)

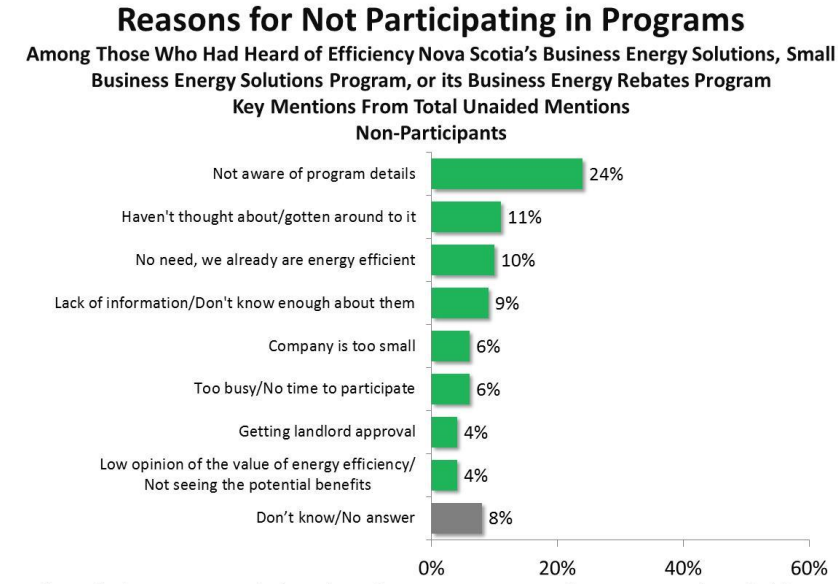
There do not appear to be notable differences in the reasons for considering ENS program participation, across the various analyzed subgroups.

Reasons for Non-Participation

Among those aware of Efficiency Nova Scotia's business energy efficiency programs, a variety of reasons for the lack of participation also were mentioned. Specifically, one-quarter (24%) of Non-Participant organizations cite ***not being aware of program details*** as the single most important reason they have not taken part in an Efficiency Nova Scotia program in the past.

Meanwhile, one in ten Non-Participant organizations mention as the single most important reason for their non-participation the notion that they either ***have not thought about it or gotten around to it*** (11%), ***not needing to be more energy efficient*** (10%), and ***a lack of information*** or ***not knowing enough about the programs*** (9%). Other reasons put forth were mentioned by fewer Non-Participant organizations.

Here again, there do not appear to be notable differences in the reasons for not having participated in an ENS program, across the various analyzed subgroups. (Table 14)



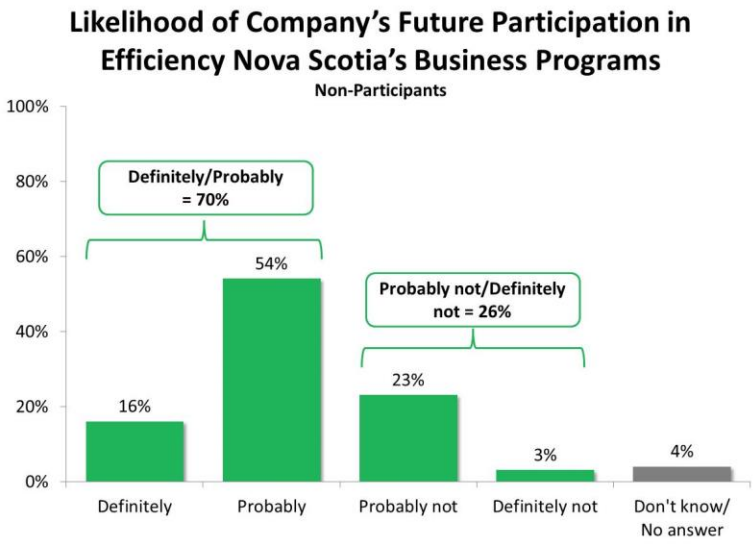
Q.14: **[ASK IF 'YES' IN Q.10 OR Q.10a]** What is the single most important reason why your company ultimately did not participate in Efficiency Nova Scotia's Small Business Energy Solutions, Business Energy Solutions or Business Energy Rebates business programs? (n=239)

Likelihood of Future Participation

Non-Participant organizations were asked the likelihood that they would participate in any of Efficiency Nova Scotia's business programs in the future. The results indicate that seven in ten (70%) say they would *definitely* or *probably* do so in the future.

Applying this rule, the current findings suggest that one-quarter (24%) of these surveyed Non-Participant organizations will indeed participate in an Efficiency Nova Scotia business program in the future. Of note, these results were derived from the survey findings whereby just over one-half (54%) of organizations would *probably* participate in an Efficiency Nova Scotia business program in the future, while one in six (16%) would *definitely* participate in one of these programs at some point in the future.

Non-Participant organizations that reported familiarity with Efficiency Nova Scotia prior to this study, were more likely to indicate they would *definitely* participate in an Efficiency Nova Scotia business program in the future. Meanwhile, those that have had lighting equipment installed at one or more business locations between 2011 and 2016, are more likely to indicate they would *definitely* or *probably* participate in an ENS program in the future. (Table 26)



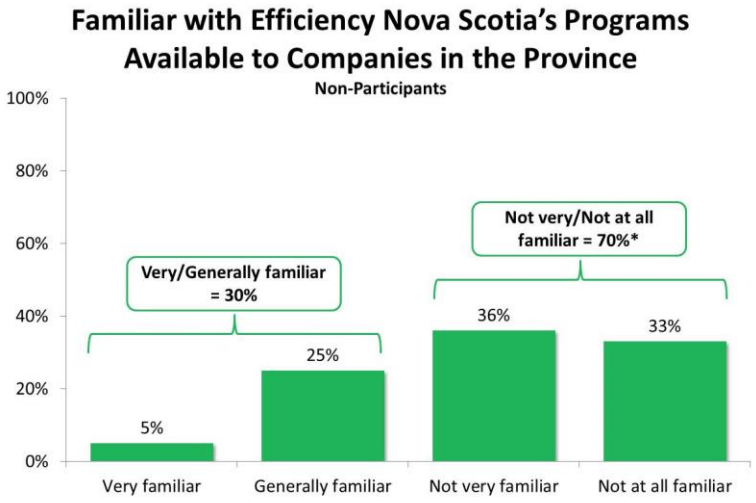
Q.26: How likely is your company to participate in any of Efficiency Nova Scotia's business programs in the future? (n=250)

Awareness and Perceptions of Efficiency Nova Scotia

Although familiarity with Efficiency Nova Scotia programs is low, nearly all Non-Participants aware of the programs offer a favourable opinion of the organization.

Program Familiarity

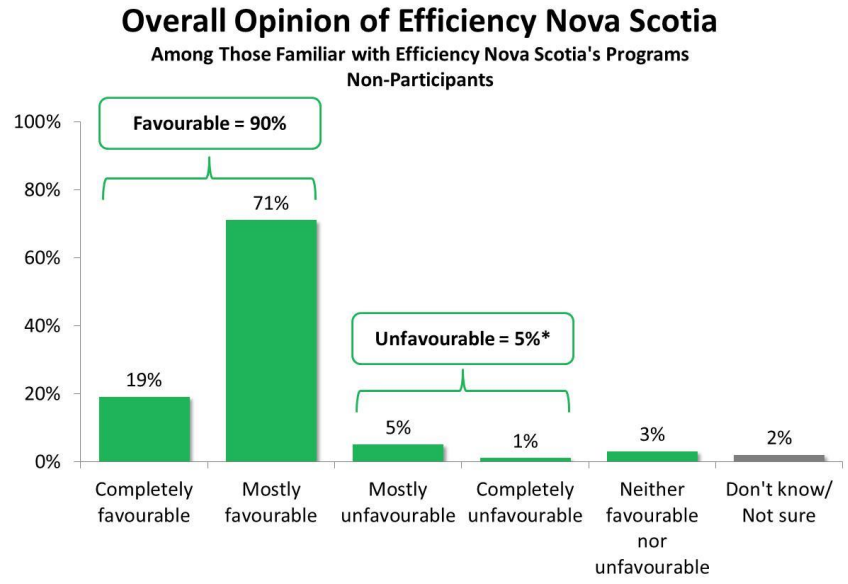
Non-Participant organizations were asked to rate their level of familiarity with Efficiency Nova Scotia's programs made available to companies in the province. Three in ten (30%) Non-Participants indicate they are *very* or *generally* familiar with the available programs, while seven in ten (70%) organizations report that they are *not very* or *not at all familiar*. Of note, one-quarter (25%) of organizations report being *generally familiar*, while only five percent indicate they are *very familiar*. (Table 27)



Q.27: How familiar, if at all, would you say you are with Efficiency Nova Scotia's programs made available to companies in the province? (n=250) **Due to rounding.*

Overall Opinion of Efficiency Nova Scotia

Nearly all Non-Participant organizations familiar with Efficiency Nova Scotia's programs offer a *favourable* overall opinion of Efficiency Nova Scotia. Specifically, nine in ten (90%) Non-Participants report either *completely* or *mostly favourable* overall opinions of Efficiency Nova Scotia, while only five percent offer *mostly unfavourable* or *completely unfavourable* overall opinions of the organization. Of note, seven in ten (71%) Non-Participants indicate a *mostly favourable* overall opinion of Efficiency Nova Scotia, while two in ten (19%) offer a *completely favourable* overall opinion. There do not appear to be notable differences in overall opinion of Efficiency Nova Scotia across the various analyzed subgroups. (Table 28)



Q.28: **[DO NOT ASK IF 'NOT AT ALL FAMILIAR' OR 'DON'T KNOW' IN Q.27]** What is your overall opinion of Efficiency Nova Scotia? (n=167) **Due to rounding.*

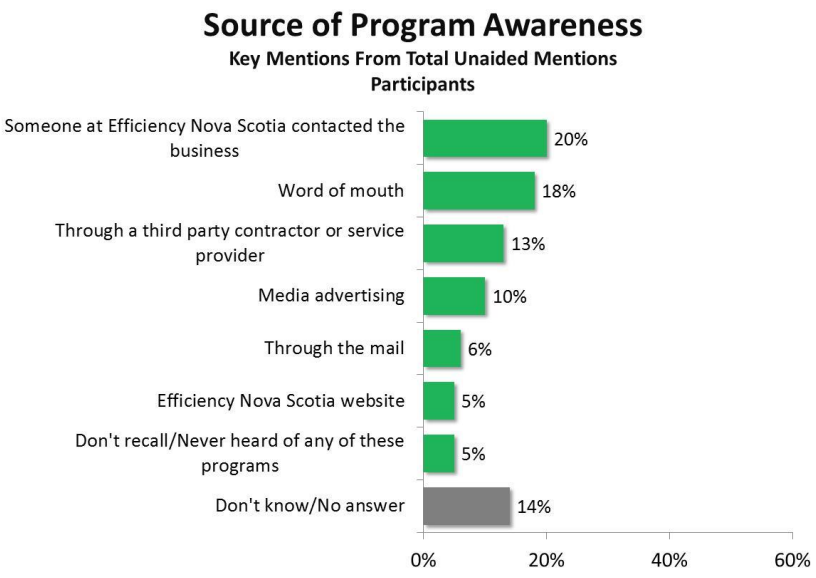
ENS Program Participants

Program Participation

The vast majority of Participant organizations made the decision to participate in an Efficiency Nova Scotia business program so as to save energy or reduce their power bill.

Source of Program Awareness

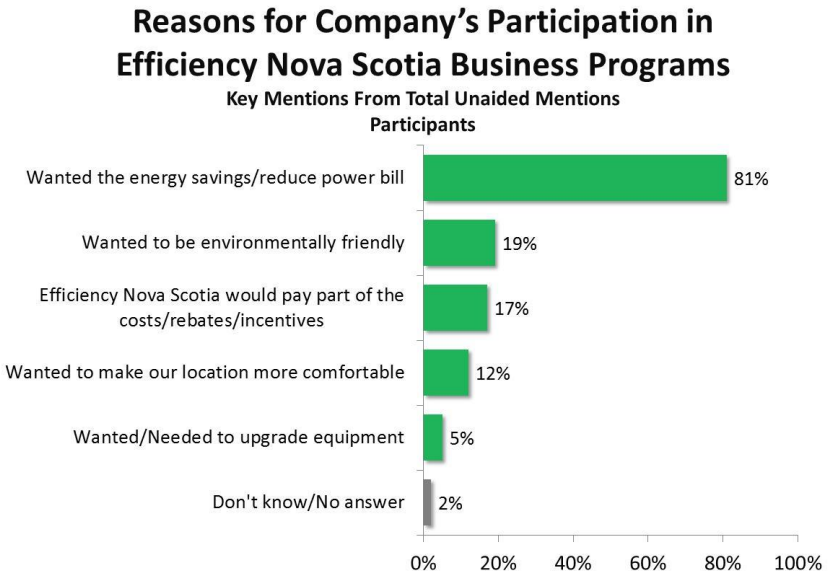
Among Participant organizations, various sources were mentioned as the initial source of awareness of ENS programs. Two in ten (20%) organizations said ***someone at ENS contacted the business,*** while a similar number (18%) reported ***word of mouth*** as the first source of program awareness. Other sources include ***through a third party contractor or service provider***, a source mentioned by just over one in ten (13%) Participants, and ***media advertising***, which was cited by one in ten (10%) Participant organizations. All other sources were mentioned by fewer than one in ten organizations. There are no notable differences in awareness sources across the various analyzed subgroups. (Table 11)



Q.11: How did your business first learn of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program? (n=250)

Reasons for Participation

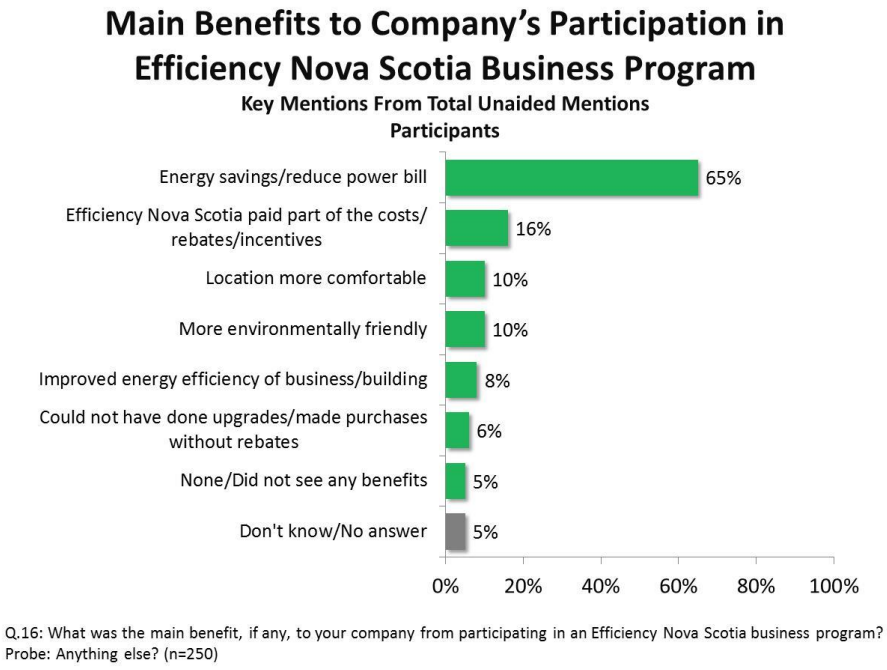
Among those organizations that took part in one or more business programs offered by Efficiency Nova Scotia, the vast majority (81%) mention ***wanting the energy savings or to reduce their power bill*** as the single most important reason for participation. Other notable reasons include ***wanting to be environmentally friendly*** (19%), ***ENS paying for part of the costs, rebates, or incentives*** (17%), and ***wanting to make their location more comfortable*** (12%). There are no notable differences in reasons for program participation across the various subgroups. (Table 15)



Q.15: What is the single most important reason why your company decided to participate in one or more Efficiency Nova Scotia business programs? Probe: Anything else? (n=250)

Benefits of Participation

A majority (65%) of Participant organizations claim that one of the main benefits received from taking part in an Efficiency Nova Scotia business program was ***energy savings or power bill reductions***. Meanwhile, one in six (16%) organizations mention that one of the main benefits of participation was ***Efficiency Nova Scotia paying for part of the costs, rebates or incentives***. Other main benefits mentioned by one in ten Participant organizations include ***the location becoming more comfortable*** (10%), the organization ***becoming more environmentally friendly*** (10%), and ***improved energy efficiency*** (8%). In addition, six percent of organizations indicated that one of the main benefits is that they ***could not have done upgrades or made purchases without rebates,*** while a small number (5%) ***did not perceive any benefits***. (Table 16)

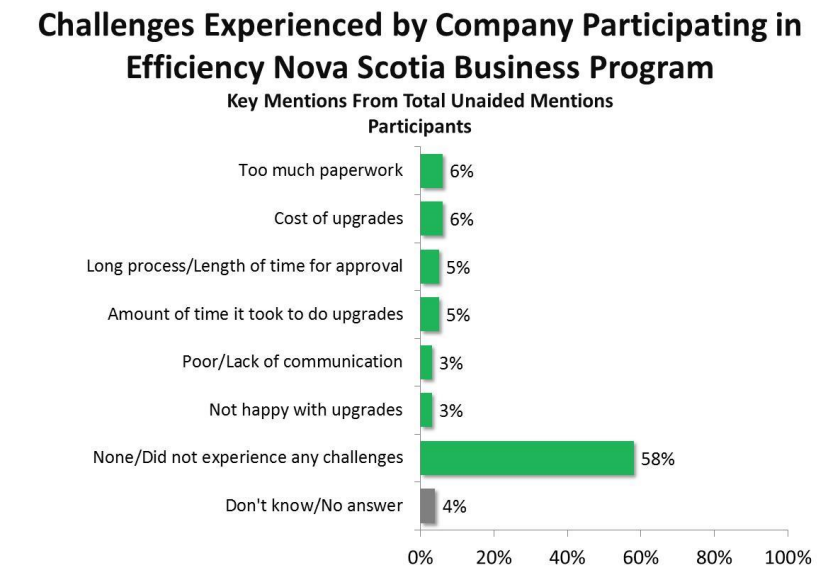


Q.16: What was the main benefit, if any, to your company from participating in an Efficiency Nova Scotia business program? Probe: Anything else? (n=250)

There does not appear to be notable differences in benefits to participation across the various analyzed subgroups.

Participation Challenges

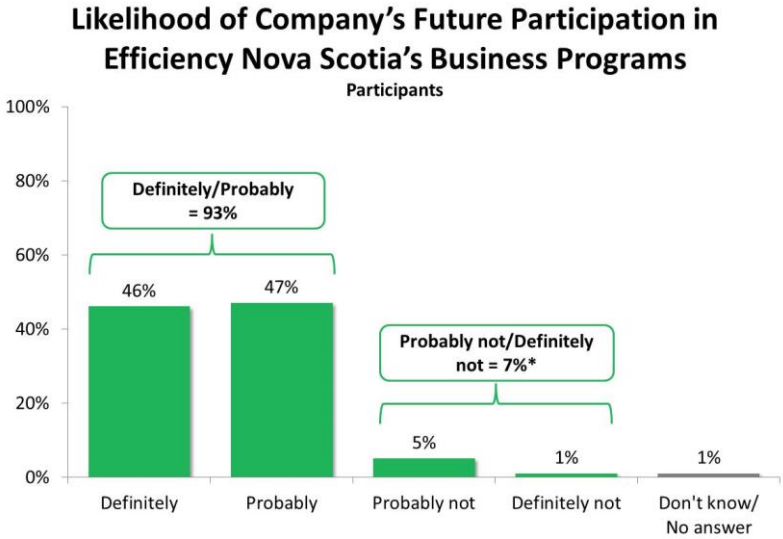
The majority (58%) of Participant organizations ***did not experience any challenges*** in participating in an Efficiency Nova Scotia business program. Specific challenges, mentioned by only six percent of organizations include ***too much paperwork*** and the ***cost of upgrades***. All other cited challenges in participating in an Efficiency Nova Scotia business program were mentioned by five percent of organizations or fewer. There are no notable differences in challenges experienced across the various analyzed subgroups. (Table 17)



Q.17: What was the primary challenge, if any, your company experienced in participating in an Efficiency Nova Scotia business program? Probe: Anything else? (n=250)

Likelihood of Future Participation

Participant organizations were also asked the likelihood that they would participate in an Efficiency Nova Scotia business program in the future. Nearly all Participants (93%) indicate that they will *definitely* or *probably* do so in the future. Of note, Participant organizations are equally as likely to *definitely* (46%) or *probably* (47%) participate in an Efficiency Nova Scotia business program in the future. (Table 26)



Q.26: How likely is your company to participate in any of Efficiency Nova Scotia's business programs in the future? (n=250)
*Due to rounding.

Of note, Participant organizations that indicate they would *definitely* recommend Efficiency Nova Scotia programs, as well as those with a *completely favourable* overall opinion of ENS, are also more likely to say they will *definitely* participate in an Efficiency Nova Scotia business program in the future.

Program Outcomes

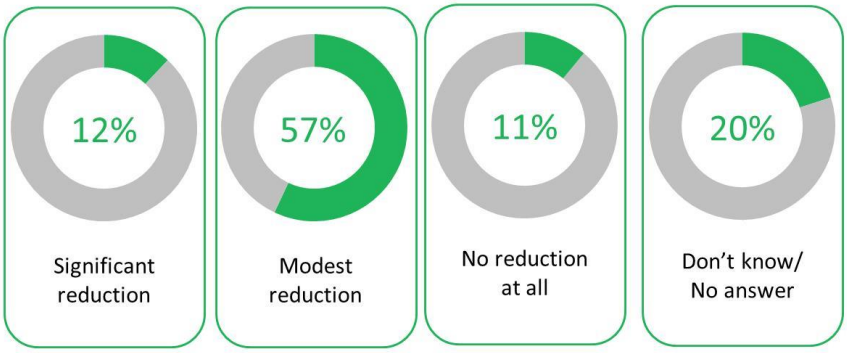
A modest majority of Participant organizations observed reductions in energy use and experienced a reduction in their power bill, as a result of their ENS business program participation.

Energy Use Reduction

As a result of the upgrades arising from participation in an Efficiency Nova Scotia business program, a majority of Participant organizations report at least some degree of reduction in their company's energy use. Specifically, one in ten (12%) organizations report a *significant* reduction, while just under six in ten (57%) indicate that there has been *modest* reduction in energy use as a result of the upgrades arising from their Efficiency Nova Scotia program participation. On the other hand, one in ten (11%) Participant organizations report no reduction *at all*, while two in ten (20%) do not know or do not have an opinion on the matter. (Table 18)

Company's Energy Use as a Result of Participating in Efficiency Nova Scotia Business Program

Participants

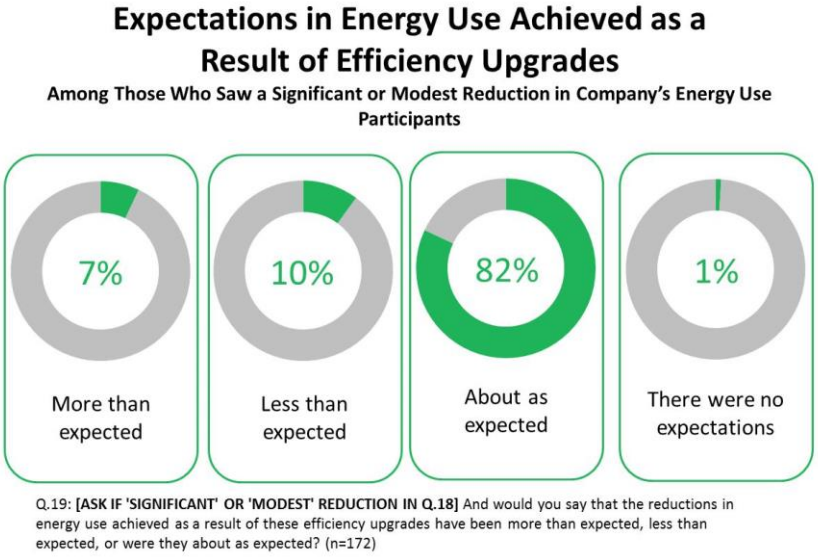


Q.18: And has there been a significant reduction, modest reduction, or no reduction at all in your company's energy use as a result of these upgrades arising from your participation in an Efficiency Nova Scotia business program? (n=250)

It is important to note that Participant organizations that would *definitely* recommend Efficiency Nova Scotia programs are more likely to report at least a *modest* reduction in energy use, as a result of the upgrades arising from their Efficiency Nova Scotia program participation.

Energy Use after Participation

Among those organizations that reported a *significant* or *modest* reduction in energy use arising from their participation in an Efficiency Nova Scotia business program, eight in ten (82%) say the reductions have been *about as expected*. Meanwhile, one in ten (10%) Participants report energy use reductions that were *less than expected*, and seven percent mention receiving reductions that were *more than expected*. (Table 19)



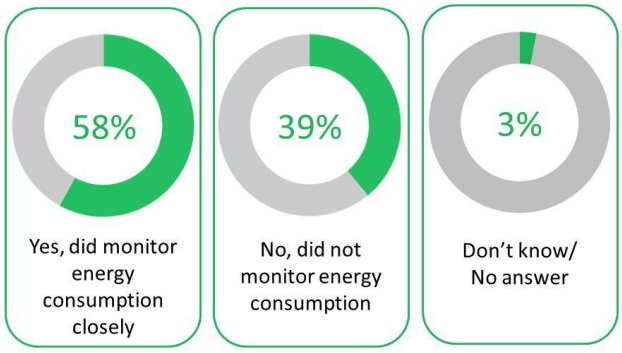
Perhaps not surprisingly, Participants that reported *significant* reductions in energy use as a result of program participation are more likely to have seen reductions that were *more than expected*. In addition, organizations with six or more full-time employees are more likely to have seen reductions that were *about as expected*, while Participants with five or fewer full-time employees are more likely to have seen reductions in energy use that were *less than expected*.

Monitoring Energy Use after Participation

After participating in Efficiency Nova Scotia's business programs, six in ten (58%) of organizations report closely monitoring energy consumption. Meanwhile, four in ten (39%) report not monitoring energy consumption after their Efficiency Nova Scotia program participation, and three percent do not know or do not have an opinion on the matter. (Table 20)

Did Company Monitor Energy Consumption After Participating in ENS Small Business Programs?

Participants



Q.20: And 'yes' or 'no,' did your company monitor its energy consumption closely after its participation in Efficiency Nova Scotia's small business programs? (n=250)

Of note, Participant organizations with two or more locations, along with those that reported *significant* reductions in energy use arising from program participation, as well as those that would recommend Efficiency Nova Scotia programs, are more likely to report closely monitoring energy consumption after participating in an Efficiency Nova Scotia business program.

Power Bill Reduction

As a result of the upgrades arising from participation in an Efficiency Nova Scotia business program, a majority (60%) of Participant organizations report at least some degree of reduction in their company's Nova Scotia Power electricity bill. Specifically, six percent of organizations report a *significant* reduction, while just over one-half (54%) indicate that there has been *modest* reduction in their electricity bill as a result of the upgrades arising from Efficiency Nova Scotia program participation. In addition, one-quarter (24%) of Participants report no reduction *at all*, while one in six (16%) do not know or do not have an opinion on the matter. (Table 21)

Company's NS Power Bill as a Result of Participating in Efficiency Nova Scotia Business Program

Participants



Q.21: And has there been a significant reduction, modest reduction, or no reduction at all in your company's NS Power electricity bill as a result of efficiency upgrades arising from your participation in an Efficiency Nova Scotia business program? (n=250)

Perhaps not surprisingly, Participants that reported *significant* reductions in energy use as a result of program participation are more likely to have also experienced *significant* reductions in their electricity bills.

In addition, organizations with five full-time employees or fewer are more likely to have undergone no reduction *at all* in their Nova Scotia Power electricity bills as a result of efficiency upgrades arising from participation in an Efficiency Nova Scotia business program.

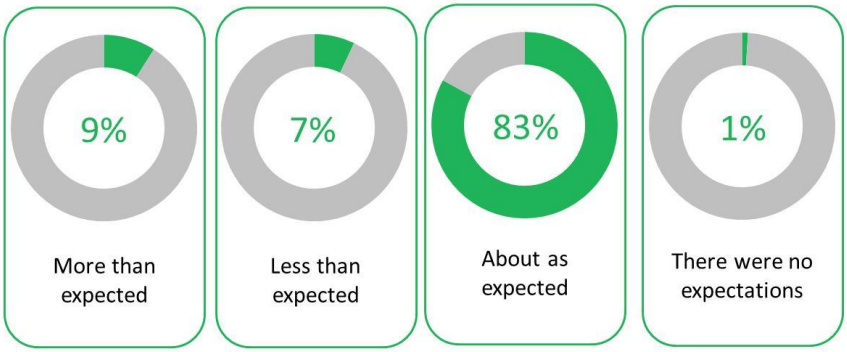
Expectations for Power Bill Reduction

Among those organizations that reported a *significant* or *modest* reduction in their electricity bills arising from participation in an Efficiency Nova Scotia business program, just over eight in ten (83%) say the reductions have been *about as expected*.

Meanwhile, one in ten (9%) such Participants report reductions that were *more than expected*, and seven percent mention receiving reductions that were *less than expected*. (Table 22)

Expectations in Electricity Bill Reductions Achieved as a Result of Efficiency Upgrades

Participants



Q.22: **[ASK IF 'SIGNIFICANT' OR 'MODEST' REDUCTION IN Q.21]** And would you say that the reductions in electricity bills achieved as a result of these efficiency upgrades have been more than expected, less than expected, or were they about as expected? (n=150)

It is also important to note that Participants reporting *significant* reductions in energy use as a result of program participation, are more likely to have experienced reductions in their electricity bills that were *more than expected.*

Recommending Efficiency Nova Scotia Programs

Nearly all Participant organizations would recommend Efficiency Nova Scotia business programs to other companies.

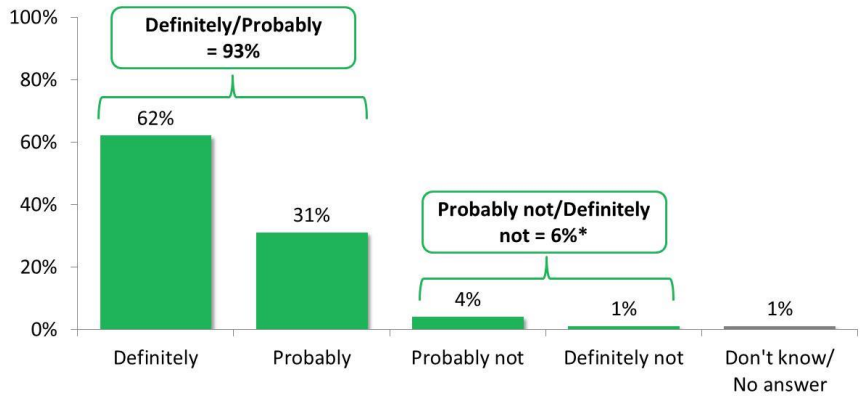
Likelihood of Recommending

Participant organizations were also asked their likelihood of recommending Efficiency Nova Scotia business programs to other companies. Nearly all Participants (93%) indicate that they would *definitely* or *probably* recommend Efficiency Nova Scotia business programs.

Of note, six in ten (62%) of Participants would *definitely* recommend, while three in ten (31%) would *probably* recommend the programs to other companies. (Table 23)

Likelihood of Recommending Efficiency Nova Scotia's Business Programs to Others

Participants

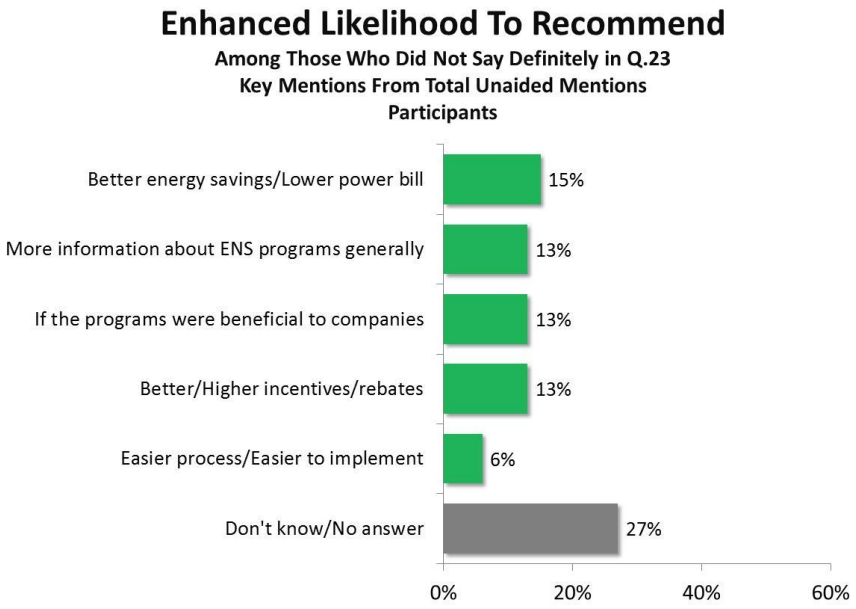


Q.23: And based on your experience, how likely are you to recommend Efficiency Nova Scotia business programs to other companies? Would you definitely, probably, probably not, or definitely not recommend these programs to others? (n=250)
**Due to rounding.*

Participant organizations that would *definitely* participate in an Efficiency Nova Scotia business program, along with those that have a *completely favourable* overall opinion of Efficiency Nova Scotia, are more likely to recommend the ENS business programs to other companies.

Enhanced Likelihood of Recommending

Among the relatively small number of surveyed organizations that did not indicate they would *definitely* recommend Efficiency Nova Scotia business programs to other companies, various considerations that would make them more likely to recommend these programs were recorded. For example, one in seven (15%) identified ***better energy savings or lower power bills***, and one in eight (13%) reported ***more information about ENS programs generally***. As well, other companies suggested that they would need assurance that ***the programs were beneficial to companies***, or ***better or higher incentives or rebates***. (Table 24)



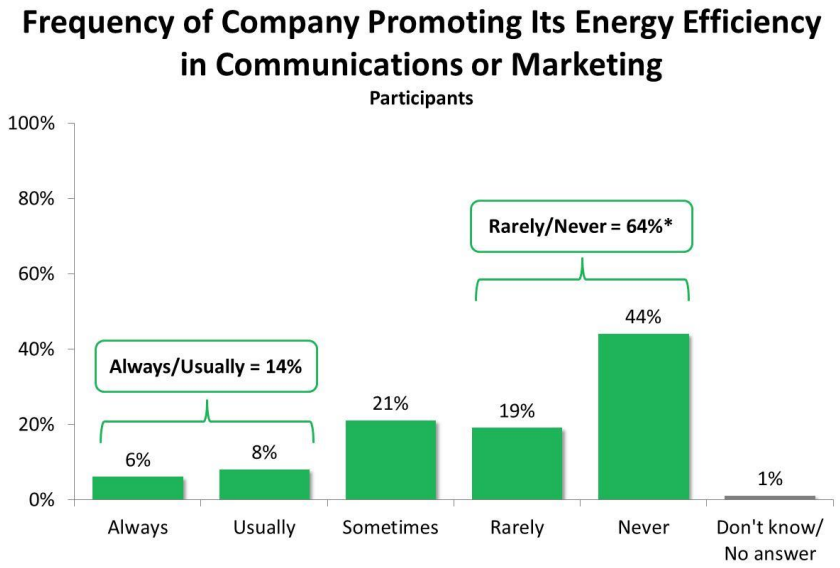
Q.24: **[DO NOT ASK IF 'DEFINITELY' IN Q.23]** What would make you more likely to recommend Efficiency Nova Scotia business programs to other companies? Probe: Anything else? (n=87)

There do not appear to be notable differences in the reasons offered, across the various analyzed subgroups.

Energy Efficiency Promotion

Most Participant organizations only infrequently promote their energy efficiency in communications and marketing, with nearly one-half never promoting energy efficiency.

Participant organizations were also asked how frequently they promote their energy efficiency in communications or marketing. Two-thirds (64%) of organizations indicate either *rarely* or *never* promoting their energy efficiency, while one in seven (14%) report either *always* or *usually* promoting their energy efficiency in communications or marketing. Meanwhile, two in ten (21%) Participants *sometimes* promote their energy efficiency. (Table 25)



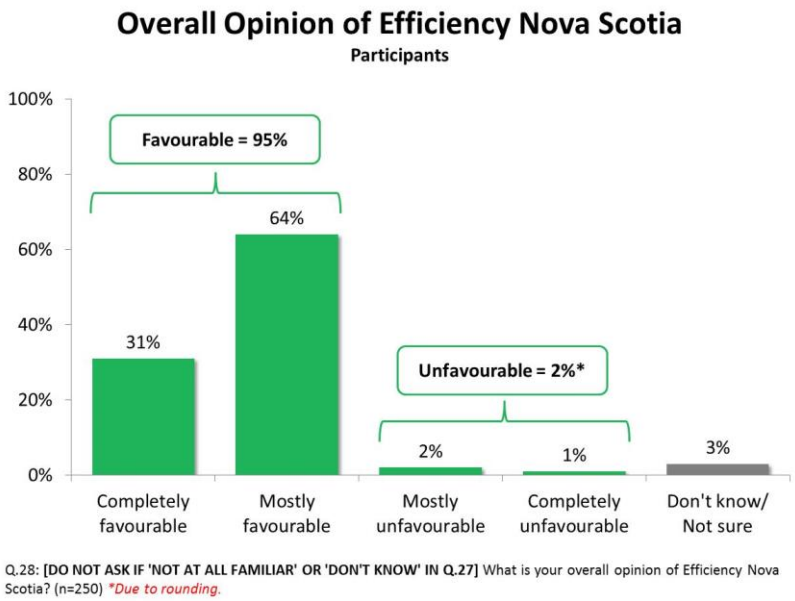
Q.25: How often, if at all, does your company promote your energy efficiency in your communications or marketing? (n=250) *Due to rounding.*

It is important to note that Participants with two or more locations are more likely to *always* or *usually* promote their energy efficiency. In addition, organizations that are less than *definitely* likely to recommend Efficiency Nova Scotia programs, along with those that are less than *definitely* likely to participate in programs in the future, are more likely to *rarely* or *never* promote their energy efficiency in communications or marketing.

Perceptions of Efficiency Nova Scotia

Favourable overall opinions of Efficiency Nova Scotia are widespread among Participant organizations.

Nearly all Participant organizations offer a favourable overall opinion of Efficiency Nova Scotia. Specifically, over nine in ten (95%) of Participants report either *completely* or *mostly favourable* overall opinions of Efficiency Nova Scotia, while only two percent offer *mostly unfavourable* or *completely unfavourable* overall opinions of the organization. Of note, two-thirds (64%) of Participants indicate a *mostly favourable* overall opinion of Efficiency Nova Scotia, while three in ten (31%) offer a *completely favourable* overall opinion. (Table 28)



Q.28: **[DO NOT ASK IF 'NOT AT ALL FAMILIAR' OR 'DON'T KNOW' IN Q.27]** What is your overall opinion of Efficiency Nova Scotia? (n=250) **Due to rounding.*

Of note, Participant organizations with six or more full-time employees, as well as those that would *definitely* recommend Efficiency Nova Scotia programs to other companies, along with those that would *definitely* participate in programs in the future, are more likely to have a *completely favourable* overall opinion of Efficiency Nova Scotia.

Joint Analysis of Participant and Non-Participant Organizations

A small number of questions were posed to both Participant as well as Non-Participant organizations. For ease of comparison, the results of these queries are displayed in tandem below. In terms of questions that 'assess' ENS or its offerings, the findings from the Participant population tend to exhibit stronger or deeper favourable tendencies, as compared to those offered by Non-Participants (although the latter nonetheless are also quite positive in nature).

Likelihood of Future Program Participation		
	Participants (n=250)	**Non-Participants (n=250)**
Definitely	46%	16%
Probably	47%	54%
Probably not	5%	23%
Definitely not	1%	3%
Don't know/No answer	1%	4%
Q.26: How likely is your company to participate in any of Efficiency Nova Scotia´s business programs in the future?		

Overall Opinion of Efficiency Nova Scotia

	Participants (n=250)	Non-Participants (n=167)
Completely favourable	31%	19%
Mostly favourable	64%	71%
Mostly unfavourable	2%	5%
Completely unfavourable	1%	1%
Neither favourable nor unfavourable	--	3%
Don't know/Not sure	3%	2%

Q.28: *Participants:* What is your overall opinion of Efficiency Nova Scotia?
Q.28: [AMONG THOSE FAMILIAR WITH EFFICIENCY NOVA SCOTIA'S PROGRAMS ('YES' IN Q.10] *Non-Participants:* What is your overall opinion of Efficiency Nova Scotia?

Source of Program Awareness
Key Mentions From Total Unaided Mentions

	Participants (n=250)	Non-Participants (n=143)
Someone at Efficiency Nova Scotia contacted the business	20%	11%
Word of mouth	18%	36%
Through a third party contractor or service provider	13%	8%
Media advertising	10%	23%
Through the mail	6%	8%
Efficiency Nova Scotia website	5%	8%
Don't recall/Never heard of any of these programs	5%	2%
Internet (in general)	4%	9%
Don't know/No answer	14%	1%

Q.11: *Participants:* How did your business first learn of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program? Q.11: [AMONG THOSE WHO HAD HEARD OF EFFICIENCY NOVA SCOTIA'S BUSINESS ENERGY SOLUTIONS, SMALL BUSINESS ENERGY SOLUTIONS PROGRAM, OR ITS BUSINESS ENERGY REBATES PROGRAM] *Non-Participants:* How did your business first learn of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program?

Study Methodology

Questionnaire Design

The questionnaire used for this study was designed by Corporate Research Associates Inc., in consultation with staff members of Efficiency Nova Scotia. Prior to being finalized, the survey was pre-tested on a small number of respondents to ensure the appropriateness of the questions and response categories.

Survey Administration

The target population of this research was those small businesses that have either have not or have participated in an ENS small business program since 2011, with annual electricity use of less than 150,000 kilowatt hours (kWh) and with Nova Scotia Power electricity account rate code of 10, 11 or 21. The use of Nova Scotia Power (NSP) contact information concerning organizations in these three rate codes permitted a random sampling of these codes.

In total, 250 telephone-based interviews were conducted with ENS small business Participants, and an additional 250 telephone-based interviews were conducted with ENS small business Non-Participants. The overall margin of error for a probability sampling of 250 ENS Participants/ENS Non-Participants, is +/- 6.1 percentage points, 19 in 20 times. Derivation of the incidence of participating in an ENS business program was based on a total of 355 interviews, resulting in an overall margin of error of +/- 5.1 percentage points, 19 in 20 times.

The telephone data collection occurred from January 30 to March 3, 2017. All interviewing was conducted by fully trained and supervised interviewers and a minimum of 10 percent of all completed interviews were subsequently verified. The average length of time required to complete a Participant interview was approximately 13 minutes. The average length of time required to complete a Non-Participant interview was approximately 12 minutes.

Data Tabulation

The Non-Participant survey data was statistically weighted so as to be representative of the true distribution of Nova Scotia Power small business clients, in terms of rate code (i.e., whether 10, 11, or 21), and region. Nova Scotia Power's three regions are as follows: East (the counties of Victoria, Richmond, Cape Breton, Inverness, Guysborough, Antigonish, and Pictou); Central (the counties of Halifax, Colchester, Cumberland, and Hants); and West (the counties of Kings, Annapolis, Digby, Yarmouth, Shelburne, Queens, and Lunenburg).

The Participant survey data was statistically weighted so as to be representative of the true distribution of Nova Scotia Power small business clients, in terms of rate code (i.e., whether 10, 11, or 12).

Completion Results/Disposition Summary

Among all eligible respondents contacted, the response rate was 29 percent. Response rate is calculated as the number of cooperative contacts (1,320), divided by the total of eligible numbers attempted (4,523). The final disposition of all telephone numbers called below is based on the Marketing Research and Intelligence Association's *Standard Record of Contact Format*.

COMPLETION RESULTS	
A. Total Numbers Attempted	**5,286**
Discontinued Number/Not in Service/Blocked Number	612
Fax/Modem	68
Non Business Number/Wrong Number	78
Duplicate Record	5
B. Eligible Numbers	**4,523**
Busy Signal	5
Answering Machine	1,409
No Answer	293
Scheduled Call Back/Qualified Not Available	448
Illness, Incapable	0
Language Problem	14
C. Total Asked	**2,354**
Gatekeeper or Respondent Refusal	706
Mid Terminate/Hang Up	300
Never Call List	28
D. Co-operative Contacts	**1,320**
Did Not Qualify, e.g., does not recall participating in ENS program	820
Completed Survey	500

Appendix A:
Study Questionnaire

IF RESPONDENTS WISH TO CONTACT EFFICIENCY NOVA SCOTIA/*EFFICIENCYONE* TO VALIDATE THE SURVEY LEGITIMACY OR FOR ANY REASON, STATE THAT ENS CAN BE REACHED AT: TOLL FREE 1-877-999-6035

Hello, my name is _____ and I am representing Corporate Research Associates, a Halifax-based survey company. We are today conducting a survey of Nova Scotia business owners, senior executives, and senior managers on behalf of Efficiency Nova Scotia, on issues relating to energy efficiency. Would that be you? **IF 'YES,' CONTINUE. SAY IF 'NO':** May I speak with an owner, senior executive, or senior manager? Please be assured that we are not attempting to sell you anything, and all information you provide will remain anonymous. As a thank you for participating, your name would be entered into a draw for an iPad, if you wish. Is this a convenient time to complete a short survey, or is there a more convenient time to arrange a callback? This survey should take less than ten minutes to complete. Today's survey is registered with the national survey registration system, should you wish to verify it. **PROVIDE MRIA CONTACT NUMBER TO RESPONDENT, IF DESIRED: 1-888-602-6742, EXTENSION 8728. THE PROJECT REGISTRATION NUMBER FOR THIS STUDY IS [READ TO RESPONDENT]. ARRANGE CALLBACK IF NECESSARY. IF ANY QUESTIONS OR CONCERNS, PLEASE COLLECT NAME AND NUMBER AND SAY A REPRESENTATIVE FROM CRA WILL CONTACT THE RESPONDENT. PASS THIS INFORMATION ALONG TO PETER MacINTOSH AT CRA AS SOON AS POSSIBLE. RE-SCHEDULE INTERVIEW FOR ANOTHER TIME IF NECESSARY. IF RESPONDENT INDICATES ANOTHER INDIVIDUAL IS MORE APPROPRIATE FOR INTERVIEW, CONTACT NEW PERSON AND START AGAIN.**

Section A: Introduction

1. Have I reached you on a cellular phone? **DO NOT READ RESPONSES - CODE ONE ONLY**

   1 Yes
   2 No
   7 Refused

SKIP TO Q.3 IF 'NO' IN Q.1

2. Are you in a safe place to talk? **DO NOT READ RESPONSES - CODE ONE ONLY**

1	Yes	**CONTINUE AT Q.3**
2	No	**SAY YOU WILL CALL BACK LATER – ARRANGE CALLBACK**
8	Don't know/No answer	**SAY YOU WILL CALL BACK LATER – ARRANGE CALLBACK**

3. *Moving along* … How many full-time employees, including yourself, are currently working at your company's operations within Nova Scotia? **RECORD NUMBER – PROBE TO AVOID ACCEPTING A RANGE**

   RECORD NUMBER: _____
   9998 Don't know/No answer

Section B: Incidence Questions

4. And how many business locations does your organization currently have in Nova Scotia?
RECORD EXACT NUMBER - PROBE TO AVOID ACCEPTING A RANGE

001 One
RECORD NUMBER OF LOCATIONS HERE, IF MORE THAN ONE: _____
998 Don't know/No answer

POSE QUESTIONS 5, 6, AND 7 IF 'ONE' IN Q.4

5. **[DO NOT POSE TO ENS LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** In 2016, did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment at your property? This includes bulbs, fixtures, occupancy sensors or other controls. Please note, changing even one burnt out bulb would count as a 'Yes,' if the activity was performed by a contractor or by maintenance staff.
DO NOT READ RESPONSES – CODE ONE ONLY

1 Yes, did have contractor/maintenance staff
2 No, did not have contractor/maintenance staff
8 Don't know/No answer

6. **[DO NOT POSE TO ENS CLIENT LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** *Moving along …* In 2015, did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment? This includes bulbs, fixtures, occupancy sensors or other controls.
DO NOT READ RESPONSES – CODE ONE ONLY

1 Yes, did have contractor/maintenance staff
2 No, did not have contractor/maintenance staff
8 Don't know/No answer

7. **[DO NOT POSE TO ENS CLIENT LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** Between 2011 and 2014, did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment? This includes bulbs, fixtures, occupancy sensors or other controls.
DO NOT READ RESPONSES – CODE ONE ONLY

1 Yes, did have contractor/maintenance staff
2 No, did not have contractor/maintenance staff
8 Don't know/No answer

POSE QUESTIONS 5a, 6a, AND 7a IF MORE THAN ONE LOCATION IN Q.4

5a. **[DO NOT POSE TO ENS LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** In 2016, at how many, if any, of your **[INSERT NUMBER OF LOCATIONS FROM Q.4]** Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment? This includes bulbs, fixtures, occupancy sensors or other controls. Please note, changing even one burnt out bulb would count as a 'Yes,' if the activity was performed by a contractor or by maintenance staff.
RECORD EXACT NUMBER - PROBE TO AVOID ACCEPTING A RANGE – NUMBER CANNOT EXCEED NUMBER COLLECTED IN Q.4

RECORD NUMBER OF LOCATIONS: _____
998 Don't know/No answer

6a. **[DO NOT POSE TO ENS CLIENT LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** *Moving along* … In 2015, at how many, if any, of your Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment? This includes bulbs, fixtures, occupancy sensors or other controls.
RECORD EXACT NUMBER - PROBE TO AVOID ACCEPTING A RANGE

RECORD NUMBER OF LOCATIONS: _____
998 Don't know/No answer

7a. **[DO NOT POSE TO ENS CLIENT LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** Between 2011 and 2014, at how many, if any, of your Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment? This includes bulbs, fixtures, occupancy sensors or other controls.
RECORD EXACT NUMBER - PROBE TO AVOID ACCEPTING A RANGE

RECORD NUMBER OF LOCATIONS: _____
998 Don't know/No answer

8. **[DO NOT POSE TO ENS CLIENT LIST; I.E., POSE ONLY TO INITIAL SAMPLE LIST]** To the best of your knowledge, did your company participate in an Efficiency Nova Scotia program prior to 2017?
READ RESPONSES ONLY IF NECESSARY – CODE ONE ONLY

1 Yes, did participate prior to 2017
2 No, did not participate prior to 2017
8 Don't know/No answer

9. **[DO NOT POSE TO ENS CLIENT LIST; POSE ONLY IF 'YES …' IN Q.8]** To the best of your knowledge, has your company ever participated in any of the following Efficiency Nova Scotia programs for small business?
READ PROGRAM DETAILS – DO NOT READ RESPONSES - CODE ONE ONLY

The Business Energy Rebates Program, a mail-in rebate program, The Business Energy Solutions Program, a program where a lighting contractor identified savings opportunities and implemented upgrades, or The Small Business Energy Solutions Program, a mail-in rebate program where an energy auditor may have helped you identify savings opportunities

1 Yes, has participated in one or more of these programs
2 No, has not participated in any of these programs
7 Did participate in a program, but unsure which one
8 Don't know/No answer

IF 'NO' OR IF 'DON'T KNOW/NO ANSWER' TO Q.9, COUNT RESPONDENT AS A *NON-PARTICIPANT*. IF 'YES …' TO Q.9, COUNT RESPONDENT AS A *PARTICIPANT*. IF 'DID PARTICIPATE …' IN Q.9, COUNT RESPONDENT AS A *PARTICIPANT*. ENS CLIENT LIST COMPANIES ARE *PARTICIPANTS*.

Section C: Program Perceptions

10. **[DO NOT POSE Q.10 TO PARTICIPANTS]** Prior to today, had you ever heard of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program?
DO NOT READ RESPONSES - ALLOW ONE RESPONSE

1 Yes, have heard
2 No, have never heard
8 Don't know/No answer

10a. **[POSE Q.10a ONLY TO NON-PARTICIPANTS WHO ANSWERED 'NO …' OR 'DON'T KNOW/NO ANSWER' TO Q.10]** Prior to today, had you ever heard of Efficiency Nova Scotia?
DO NOT READ RESPONSES - ALLOW ONE RESPONSE

1 Yes, have heard
2 No, have never heard
8 Don't know/No answer

11. **[POSE Q.11 TO PARTICIPANTS, AND TO NON-PARTICIPANTS IF 'YES' IN Q.10]** How did your business first learn of Efficiency Nova Scotia's Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program?
DO NOT READ RESPONSES – ALLOW MULTIPLE RESPONSES

01 Media advertising
02 Someone at Efficiency Nova Scotia contacted the business
03 Through a third party contractor or service provider
04 Efficiency Nova Scotia website
05 Facebook or other social media
06 Word of mouth
07 Through the mail
08 Received direct mail from Efficiency Nova Scotia
09 Store where new equipment was purchased
10 Home show
11 Permit office
12 Building management
13 Direct email
14 Participation in another Efficiency Nova Scotia program
15 The business contacted Efficiency Nova Scotia program options
97 Don't recall/Never heard of any of these programs **POSE Q.11a TO PARTICIPANTS ONLY**
98 Don't know/No answer
99 Other [**SPECIFY:** _____]

11a. **[POSE Q.11a ONLY TO PARTICIPANTS WHO RESPONDED WITH CODE 97 IN Q.11] [STATE THE FOLLOWING IF RESPONDENT IS FROM ENS CLIENT SAMPLE:** Our records indicate that your company has previously participated in an Efficiency Nova Scotia program.**] [STATE THE FOLLOWING IF RESPONDENT IS FROM THE INITIAL SAMPLE LIST:** You mentioned earlier that your company had previously participated in an Efficiency Nova Scotia program.**]** To the best of your knowledge, has your company indeed participated in an Efficiency Nova Scotia program in the past?
DO NOT READ RESPONSES - ALLOW ONE RESPONSE

1	Yes, has participated	**CONTINUE**
2	No, has never participated	**THANK, TERMINATE, RECORD, AND KEEP DATA**
8	Don't know/No answer	**THANK, TERMINATE, RECORD, AND KEEP DATA**

12. **[POSE Q.12 ONLY IF 'YES …' IN Q.10 OR Q.10a]** Has your company ever considered participating in the business energy efficiency programs offered by Efficiency Nova Scotia? **ALLOW ONE RESPONSE**

1 Yes, has considered
2 No, has not considered
8 Don't know/No answer

13. **[POSE Q.13 ONLY IF 'YES …' IN Q.12]** a. What is the single most important reason why your company considered participating in Efficiency Nova Scotia's Small Business Energy Solutions, Business Energy Solutions or Business Energy Rebates business programs? **PROBE:** b. Any other reasons? **DO NOT READ RESPONSES - ALLOW MULTIPLE RESPONSES, BUT RECORD FIRST AND SUBSEQUENT MENTIONS SEPARATELY**

01 Wanted the energy savings/reduce power bill
02 Efficiency Nova Scotia would pay part of the costs/rebates/incentives
03 The 24 month interest free financing on our power bill
04 Wanted to make our location more comfortable
05 Wanted to be environmentally friendly
98 Don't know/No answer
99 Other **[SPECIFY: _____]**

14. **[POSE Q.14 ONLY IF 'YES …' IN Q.10 OR Q.10a]** a. What is the single most important reason why your company ultimately did not participate in Efficiency Nova Scotia's Small Business Energy Solutions, Business Energy Solutions or Business Energy Rebates business programs? **PROBE:** b. Any other reasons? **DO NOT READ RESPONSES - ALLOW MULTIPLE RESPONSES, BUT RECORD FIRST AND SUBSEQUENT MENTIONS SEPARATELY**

01 Cost of upgrades
02 Having to close during upgrades
03 Amount of time it took to do upgrades
04 Bad advice about energy efficiency upgrades
05 Getting financing
06 Getting landlord approval
07 Getting landlord to cost share
08 Low opinion of Efficiency Nova Scotia
09 No need, we already are energy efficient
10 Low opinion of the value of energy efficiency/not seeing the potential benefits
96 None/Nothing prevented us
98 Don't know/No answer
99 Other [**SPECIFY:** _____]

15. **[POSE Q.15 ONLY TO PARTICIPANTS]** a. What is the single most important reason why your company decided to participate in one or more Efficiency Nova Scotia business programs? **PROBE:** Anything else? **DO NOT READ RESPONSES - ALLOW MULTIPLE RESPONSES, BUT RECORD FIRST AND SUBSEQUENT MENTIONS SEPARATELY**

01 Wanted the energy savings/reduce power bill
02 Efficiency Nova Scotia would pay part of the costs/rebates/incentives
03 The 24 month interest free financing on our power bill
04 Wanted to make our location more comfortable
05 Wanted to be environmentally friendly
98 Don't know/No answer
99 Other [**SPECIFY**: _____]

16. **[POSE Q.16 ONLY TO PARTICIPANTS]** a. What was the main benefit, if any, to your company from participating in an Efficiency Nova Scotia business program? **PROBE:** b. Any others? **DO NOT READ RESPONSES - ALLOW MULTIPLE RESPONSES, BUT RECORD FIRST AND SUBSEQUENT MENTIONS SEPARATELY**

01 Energy savings/reduce power bill
02 Efficiency Nova Scotia paid part of the costs/rebates/incentives
03 The 24 month interest free financing on our power bill
04 Could not have done upgrades/made purchases without rebates
05 Location more comfortable
06 More environmentally friendly
97 None/Did not see any benefits
98 Don't know/No answer
99 Other **[SPECIFY**: _____**]**

17. **[POSE Q.17 ONLY TO PARTICIPANTS]** a. What was the primary challenge, if any, your company experienced in participating in an Efficiency Nova Scotia business program? **PROBE:** b. Anything else? **DO NOT READ RESPONSES - ALLOW MULTIPLE RESPONSES, BUT RECORD FIRST AND SUBSEQUENT MENTIONS SEPARATELY**

01 Cost of upgrades
02 Cost over-runs
03 Having to close during upgrades
04 Amount of time it took to do upgrades
05 Upgrades took longer than expected
06 Bad advice about energy efficiency upgrades
07 Getting financing
08 Getting landlord approval
09 Getting landlord to cost share
97 None/Did not experience any challenges
98 Don't know/No answer
99 Other [**SPECIFY**: _____]

18. **[POSE Q.18 ONLY TO PARTICIPANTS]** And has there been a **[READ RESPONSES IN ORDER]** in your company's energy use as a result of these upgrades arising from your participation in an Efficiency Nova Scotia business program? We are not asking here about your bill, only about your consumption amount. **ALLOW ONE RESPONSE**

1 Significant reduction
2 Modest reduction, or
3 No reduction at all

VOLUNTEERED

8 Don't know/No answer

19. **[POSE Q.19 ONLY IF CODE 1 OR CODE 2 IN Q.18]** And would you say that the reductions in energy use achieved as a result of these efficiency upgrades have been …:
READ RESPONSES IN ORDER - ALLOW ONE RESPONSE

1 More than expected
2 Less than expected, or were they
3 About as expected
VOLUNTEERED
7 There were no expectations
8 Don't know/No answer

20. **[POSE Q.20 ONLY TO PARTICIPANTS]** And 'yes' or 'no,' did your company monitor its energy consumption closely after its participation in Efficiency Nova Scotia's small business programs?
READ RESPONSES ONLY IF NECESSARY - ALLOW ONE RESPONSE

1 Yes, did monitor energy consumption closely
2 No, did not monitor energy consumption closely
VOLUNTEERED
8 Don't know/No answer

21. **[POSE Q.21 ONLY TO PARTICIPANTS]** And has there been a **[READ RESPONSES IN ORDER]** in your company's NS Power electricity bill as a result of efficiency upgrades arising from your participation in an Efficiency Nova Scotia business program? **ALLOW ONE RESPONSE**

1 Significant reduction
2 Modest reduction, or
3 No reduction at all
VOLUNTEERED
8 Don't know/No answer

22. **[POSE Q.22 ONLY IF CODE 1 OR CODE 2 IN Q.21]** And would you say that the reductions in electricity bills achieved as a result of these efficiency upgrades have been …:
READ RESPONSES IN ORDER - ALLOW ONE RESPONSE

1 More than expected
2 Less than expected, or were they
3 About as expected
VOLUNTEERED
7 There were no expectations
8 Don't know/No answer

23. **[POSE Q.23 ONLY TO PARTICIPANTS]** And based on your experience, how likely are you to recommend Efficiency Nova Scotia business programs to other companies? Would you **[READ RESPONSES IN ORDER]** recommend these programs to others?
ALLOW ONE RESPONSE

1 Definitely
2 Probably
3 Probably not, or
4 Definitely not
VOLUNTEERED
8 Don't know/No answer

24. **[POSE Q.24 ONLY IF CODES 2, 3, 4 OR 8 IN Q.23]** What would make you more likely to recommend Efficiency Nova Scotia business programs to other companies? **PROBE:** Anything else?
RECORD VERBATIM

_____

98 Don't know/No answer

25. **[POSE Q.25 ONLY TO PARTICIPANTS]** How often, if at all, does your company promote your energy efficiency in your communications or marketing? Would it be …:
READ RESPONSES IN ORDER – ALLOW ONE RESPONSE

1 Always
2 Usually
3 Sometimes
4 Rarely, or
5 Never
VOLUNTEERED
8 Don't know/No answer

26. **[POSE Q.26 TO EVERYONE]** How likely is your company to participate in any of Efficiency Nova Scotia's business programs in the future? Would you say you will **[READ RESPONSES IN ORDER]** Participate? **ALLOW ONE RESPONSE**

1 Definitely
2 Probably
3 Probably not, or
4 Definitely not
VOLUNTEERED
8 Don't know/No answer

Section D: Awareness and Perception of Efficiency Nova Scotia

27. **[POSE Q.27 ONLY TO NON-PARTICIPANTS]** How familiar, if at all, would you say you are with Efficiency Nova Scotia's programs made available to companies in the province? Are you …:
READ RESPONSES IN ORDER - ALLOW ONE RESPONSE

1 Very familiar
2 Generally familiar
3 Not very familiar, or
4 Not at all familiar
VOLUNTEERED
8 Don't know/Not sure

28. **[POSE Q.28 TO PARTICIPANTS, AS WELL AS TO NON-PARTICIPANTS WHO SAID EITHER CODES 1, 2, OR 3 IN Q.27]** What is your overall opinion of Efficiency Nova Scotia? Is it …:
READ RESPONSES IN ORDER - ALLOW ONE RESPONSE

1 Completely favourable
2 Mostly favourable
3 Mostly unfavourable, or
4 Completely unfavourable
VOLUNTEERED
7 Neither favourable nor unfavourable
8 Don't know/Not sure

Section E: Classification Questions

POSE THIS SECTION TO EVERYONE: In closing, we would appreciate a little information about your organization that would help us analyze the results of this survey. Please be assured that all information collected will remain confidential.

29. And what is the postal code of your company's primary Nova Scotia office?
RECORD, EVEN IF THE RESPONDENT CAN ONLY GIVE PARTIAL POSTAL CODE

_B_ ___ ___ ___ ___ ___
98 Don't know/No answer

30. Do you currently own, lease, or rent your primary business premises at your locations in Nova Scotia?
DO NOT READ RESPONSES – CODE AS MANY AS APPLY – IF RESPONDENT SAYS COMPANY HAS MORE THAN ONE PREMISES, ASK THAT S/HE TAKE ALL LOCATIONS INTO ACCOUNT

1 Own
2 Lease
3 Rent
8 Don't know/No answer

31. What is the primary **heating source** for your primary Nova Scotia business location?
DO NOT READ RESPONSES, UNLESS REQUIRED - CODE ONE RESPONSE ONLY

01 Oil
02 Electricity
03 Wood
04 Propane
05 Natural Gas
VOLUNTEERED
98 Don't know/No answer
99 Other [**SPECIFY**: _____]

32. Does your company pay for its own electricity at your primary Nova Scotia locations, or does someone else, such as a landlord pay for it?
CODE ONE ONLY – PROBE FOR APPLICABLE RESPONSE

01 Yes, pay for own
02 Head office or other department pays
03 No, landlord pays
98 Don't know/No answer
99 Other [**SPECIFY**: _____]

33. a. In what specific business sector or industry is your company currently involved as its primary activity? **PROBE:** b. Any others? **DO NOT READ SECTORS - CODE AS MANY AS APPLY - RECORD FIRST/SUBSEQUENT MENTIONS SEPARATELY**

01 Accommodations
02 Agriculture & related services
03 Automotive services
04 Business services **(SPECIFY**: _____)
05 Communication & Other utility
06 Construction
07 Energy
08 Financial services (banks/insurance)
09 Fisheries/Trapping
10 Forestry & Logging
11 Grocers/Convenience stores
12 Manufacturing
13 Mining/quarrying
14 Property management
15 Restaurants
16 Retail stores
17 Transportation and storage
18 Wholesale
19 Real estate
98 No answer/Refused
99 Other **(SPECIFY: _____)**

34. To the best of your knowledge, approximately what percentage of your company's operating budget for Nova Scotia locations is spent on energy costs? **RECORD PERCENTAGE; PROBE TO AVOID ACCEPTING A RANGE**

RECORD PERCENTAGE: _____%
998 Don't know/No answer

_____%
998 Don't know/No answer

35. As mentioned, if you wish, we will enter your name in the draw for an iPad. Would you like to be entered in the draw? **CODE ONE ONLY – RECORD NAME AND EMAIL ADDRESS**

1 Yes, am interested in draw **[RECORD NAME: _____ EMAIL ADDRESS: _____]**
2 No, am not interested in draw

Thank you for your assistance and cooperation!

Appendix B:
Tabular Results

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 3:

How many full-time employees, including yourself, are currently working at your company´s operations within Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
1-2	31	28	40	30	40	8	18	54	0	36	8	28	40	32	30	28	20	42	29	33
3-5	26	24	23	35	28	21	20	46	0	27	22	23	35	25	27	27	26	20	22	32
6-10	17	19	18	12	15	26	17	0	42	19	13	20	13	22	15	17	27	13	20	13
11-15	10	12	6	7	7	16	9	0	23	7	20	12	4	10	9	10	11	8	12	7
16+	14	16	11	14	9	27	32	0	35	10	33	15	8	10	16	17	13	14	16	12
Don't know/No answer	2	1	2	2	2	2	4	0	0	1	4	1	0	0	2	1	1	3	1	3
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
MEAN	8.7	9.2	7.1	9.0	6.5	14.3	13.5	2.6	17.3	6.6	18.0	9.8	5.4	8.7	8.7	9.5	9.9	9.1	9.9	7.1
MEDIAN	4.0	4.0	4.0	5.0	4.0	10.0	8.0	2.0	12.0	4.0	12.0	5.0	3.0	5.0	4.0	5.0	6.0	4.0	5.0	4.0

Note: Values greater than 100 were excluded from the calculation of the mean and median.

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 4:

And how many business locations does your organization currently have in Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
1	80	83	77	76	83	72	74	89	69	100	0	78	89	83	79	77	76	80	78	82
2	10	10	11	9	7	17	15	6	15	0	51	11	8	11	10	11	16	9	11	9
3+	9	7	10	15	9	10	11	4	15	0	49	12	2	6	11	11	8	11	11	7
Don't know/No answer	1	0	2	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
MEAN	1.5	1.5	1.4	1.6	1.4	1.8	1.5	1.2	1.9	1.0	3.6	1.6	1.1	1.3	1.6	1.6	1.4	1.6	1.5	1.5
MEDIAN	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	1.0	1.0

Note: Values greater than 20 were excluded from the calculation of the mean and median.

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 5/5a:

In 2016, at how many, if any, of your Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
0	53	54	57	50	60	34	54	61	42	62	21	32	100	49	55	52	43	58	50	58
1	38	40	31	37	33	50	40	36	41	38	35	57	0	43	35	38	48	34	40	34
2	3	2	3	4	1	9	2	0	6	0	14	4	0	5	2	2	5	3	4	1
3+	4	3	6	5	4	4	4	1	8	0	20	6	0	2	5	4	5	2	4	4
Don't know/No answer	2	1	2	4	2	3	0	1	3	0	9	1	0	1	3	4	0	2	3	2
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
% NO LOCATIONS (0)	53	54	57	50	60	34	54	61	42	62	21	32	100	49	55	52	43	58	50	58
% AT LEAST ONE LOCATION (1+)	44	45	41	46	38	63	46	38	55	38	70	67	0	50	42	44	57	40	47	40

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 6/6a:

In 2015, at how many, if any, of your Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
0	52	53	58	47	59	34	46	61	42	57	36	32	100	48	54	51	55	56	52	53
1	36	40	28	37	34	43	35	34	39	41	18	55	0	43	34	36	36	33	36	37
2	3	3	2	3	1	9	5	1	6	0	14	4	0	4	2	2	5	3	4	2
3+	3	2	6	5	3	4	6	1	6	0	17	5	0	2	4	3	5	4	3	4
Don't know/No answer	5	3	5	9	3	10	9	3	6	2	15	4	0	3	6	7	0	3	5	5
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
% NO LOCATIONS (0)	52	53	58	47	59	34	46	61	42	57	36	32	100	48	54	51	55	56	52	53
% AT LEAST ONE LOCATION (1+)	43	44	37	45	38	56	45	36	52	41	49	65	0	49	40	42	45	41	42	43

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 7/7a:

Between 2011 and 2014, at how many, if any, of your Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
0	42	42	42	44	50	20	42	51	31	44	36	21	100	30	48	41	52	42	37	50
1	43	47	39	36	38	58	36	39	49	49	19	65	0	55	37	41	36	47	46	38
2	1	1	1	4	1	4	2	0	3	0	8	2	0	4	0	2	3	0	2	1
3+	4	2	4	7	3	6	4	2	5	0	19	6	0	2	5	4	5	4	4	4
Don't know/No answer	10	8	14	9	8	13	15	7	12	7	19	6	0	10	10	12	4	7	12	7
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
% NO LOCATIONS (0)	42	42	42	44	50	20	42	51	31	44	36	21	100	30	48	41	52	42	37	50
% AT LEAST ONE LOCATION (1+)	48	50	44	47	41	67	42	42	57	49	46	72	0	60	42	46	44	51	52	42

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 5/5a/6/6a/7/7a COMBINED:

Between 2011 and 2016, at how many, if any, of your Nova Scotia business locations did your company have a professional contractor or facility maintenance staff install or replace any lighting equipment?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
% NO LOCATIONS	28	24	37	32	33	15	32	37	17	32	16	0	100	25	30	30	26	24	28	30
% AT LEAST ONE LOCATION	66	73	54	61	63	77	59	59	76	64	76	100	0	70	64	64	71	71	65	67
Don't know/No answer	6	4	9	7	5	8	10	4	7	4	8	0	0	4	6	6	4	5	7	3
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

TABLE 8:

To the best of your knowledge, did your company participate in an Efficiency Nova Scotia program prior to 2017?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Yes, did participate prior to 2017	13	12	10	17	13	13	14	10	16	11	23	15	6	15	12	15	8	9	16	9
No, did not participate prior to 2017	82	82	86	76	85	72	80	86	77	83	76	79	90	80	82	79	87	86	79	85
Don't know/No answer	5	6	4	7	2	15	6	4	7	7	1	6	3	5	6	5	5	5	5	5
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 9:

[ASK IF 'YES' IN Q8] To the best of your knowledge, has your company ever participated in any of the following Efficiency Nova Scotia programs for small business?

The Business Energy Rebates Program, a mail-in rebate program, The Business Energy Solutions Program, a program where a lighting contractor identified savings opportunities and implemented upgrades, or The Small Business Energy Solutions Program, a mail-in rebate program where an energy auditor may have helped you identify savings opportunities

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
No, has not participated in any of these programs	83	87	100	68	89	68	86	93	74	85	80	83	72	95	77	80	100	89	77	98
Don't know/No answer	17	13	0	32	11	32	14	7	26	15	20	17	28	5	23	20	0	11	23	2
WEIGHTED SAMPLE SIZE (#)	**35**	**18**	**6**	**11**	**24**	**9**	**2**	**15**	**18**	**23**	**12**	**26**	**5**	**12**	**22**	**26**	**3**	**5**	**24**	**11**
UNWEIGHTED SAMPLE SIZE (#)	**34**	**16**	**7**	**11**	**16**	**11**	**7**	**14**	**19**	**20**	**14**	**25**	**5**	**11**	**23**	**27**	**4**	**4**	**22**	**12**

TABLE 10:

Prior to today, had you ever heard of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Yes, have heard	56	57	47	63	54	62	63	50	65	55	64	55	54	88	42	61	52	50	100	0
No, have never heard	43	42	53	37	46	36	37	50	34	45	36	44	46	11	58	39	45	50	0	100
Don't know/No answer	0	1	0	0	0	2	0	0	1	1	0	1	0	1	0	0	2	0	0	0
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 10a:

[ASK IF 'NO' OR 'DON'T KNOW' IN Q10] Prior to today, had you ever heard of Efficiency Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Yes, have heard	89	95	91	73	89	92	94	85	99	92	81	89	95	100	89	89	92	90	0	89
No, have never heard	11	5	9	27	11	8	6	15	1	8	19	11	5	0	11	11	8	10	0	11
WEIGHTED SAMPLE SIZE (#)	**118**	**64**	**31**	**23**	**89**	**25**	**4**	**76**	**39**	**97**	**19**	**79**	**35**	**10**	**108**	**67**	**21**	**31**	**0**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**107**	**51**	**32**	**24**	**58**	**30**	**19**	**60**	**44**	**87**	**19**	**70**	**32**	**7**	**100**	**67**	**19**	**21**	**0**	**106**

TABLE 10a:

[TOTAL SAMPLE] Prior to today, had you ever heard of Efficiency Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Yes, have heard	95	98	95	90	95	97	98	93	100	97	93	95	98	100	93	96	96	95	100	89
No, have never heard	5	2	5	10	5	3	2	7	0	3	7	5	2	0	7	4	4	5	0	11
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 11: TOTAL MENTIONS

[ASK IF 'YES' IN Q10] How did your business first learn of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Word of mouth	36	36	32	36	38	31	23	39	33	41	17	36	40	33	38	36	30	31	36	0
Media advertising	23	23	34	15	27	15	13	19	28	23	23	27	18	19	27	22	26	30	23	0
Someone at Efficiency Nova Scotia contacted the business	11	13	6	11	12	9	15	10	12	14	3	11	12	11	11	11	1	18	11	0
Internet (in general)	9	8	2	15	8	10	10	8	8	6	19	8	7	8	10	9	6	13	9	0
Through the mail	8	7	11	10	10	4	7	10	7	9	5	5	14	9	8	10	0	14	8	0
Through a third party contractor or service provider	8	8	5	10	6	13	15	7	10	7	11	7	9	11	5	9	8	7	8	0
Efficiency Nova Scotia website	8	4	18	8	7	10	7	6	9	6	13	9	4	7	8	4	11	15	8	0
Facebook or other social media	5	6	8	0	5	7	0	4	6	4	8	6	4	6	4	5	5	3	5	0
Don’t recall/Never heard of any of these programs	2	2	2	4	0	6	14	2	3	1	7	3	1	0	4	3	3	0	2	0
Participation in another Efficiency Nova Scotia program	2	2	0	3	3	0	3	0	4	2	4	3	0	5	0	3	0	0	2	0
Home show	2	3	0	1	2	3	4	0	4	0	8	3	0	3	1	3	0	0	2	0
Building management	2	3	0	0	2	3	0	4	0	2	0	3	0	4	0	2	5	0	2	0
The business contacted Efficiency Nova Scotia program options	1	2	0	0	2	0	0	2	0	1	0	0	4	2	0	0	7	0	1	0
Received direct mail from Efficiency Nova Scotia	1	2	0	0	2	0	0	2	0	1	0	2	0	0	2	0	0	5	1	0
Other	11	9	15	10	10	10	17	10	11	8	18	14	6	19	3	14	6	0	11	0
Don’t know/No answer	1	0	0	3	1	0	0	2	0	1	0	0	0	0	2	1	0	0	1	0
WEIGHTED SAMPLE SIZE (#)	**151**	**84**	**28**	**39**	**103**	**40**	**7**	**77**	**72**	**117**	**33**	**98**	**41**	**71**	**79**	**103**	**23**	**31**	**151**	**0**
UNWEIGHTED SAMPLE SIZE (#)	**143**	**70**	**27**	**46**	**68**	**45**	**30**	**65**	**75**	**108**	**35**	**94**	**37**	**68**	**75**	**103**	**21**	**24**	**143**	**0**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 12:

[ASK IF 'YES' IN Q10 OR Q10a] Has your company ever considered participating in the business energy efficiency programs offered by Efficiency Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Yes, has considered	35	33	37	39	30	47	46	29	43	33	43	37	25	52	27	37	32	28	48	15
No, has not considered	62	66	59	57	69	46	50	70	52	64	54	61	72	44	71	61	65	69	49	83
Don't know/No answer	3	2	4	5	2	6	4	1	5	3	3	3	2	4	2	2	3	3	4	2
WEIGHTED SAMPLE SIZE (#)	**256**	**144**	**56**	**56**	**181**	**63**	**11**	**141**	**110**	**207**	**48**	**169**	**75**	**81**	**175**	**162**	**42**	**59**	**151**	**104**
UNWEIGHTED SAMPLE SIZE (#)	**239**	**119**	**56**	**64**	**119**	**72**	**48**	**116**	**118**	**188**	**51**	**157**	**67**	**75**	**164**	**163**	**39**	**43**	**143**	**95**

TABLE 13: TOTAL MENTIONS

[ASK IF 'YES' IN Q12] What is the single most important reason why your company considered participating in Efficiency Nova Scotia´s Small Business Energy Solutions, Business Energy Solutions or Business Energy Rebates business programs?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Wanted the energy savings/reduce power bill	83	91	83	67	82	87	85	73	92	83	86	88	77	87	80	80	94	87	84	81
Wanted to be environmentally friendly	20	14	26	28	19	24	15	27	13	21	18	23	15	22	19	15	28	32	17	38
Efficiency Nova Scotia would pay part of the costs/rebates/incentives	15	5	31	21	16	13	15	18	12	15	15	16	10	17	13	16	8	18	15	9
Wanted to make our location more comfortable	12	14	8	10	11	13	9	11	13	9	21	12	14	8	14	10	0	26	11	17
Other	10	9	7	15	11	9	13	8	12	11	7	10	11	9	11	10	13	10	10	10
Don't know/No answer	2	0	0	6	3	0	4	3	0	2	0	0	0	0	3	2	2	0	2	0
WEIGHTED SAMPLE SIZE (#)	**89**	**47**	**21**	**22**	**54**	**30**	**5**	**41**	**47**	**68**	**21**	**62**	**19**	**42**	**48**	**60**	**13**	**16**	**72**	**16**
UNWEIGHTED SAMPLE SIZE (#)	**91**	**43**	**20**	**28**	**36**	**34**	**21**	**38**	**51**	**66**	**25**	**62**	**20**	**44**	**47**	**64**	**14**	**13**	**75**	**15**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 14: TOTAL MENTIONS

[ASK IF 'YES' IN Q10 OR Q10a] What is the single most important reason why your company ultimately did not participate in Efficiency Nova Scotia´s Small Business Energy Solutions, Business Energy Solutions or Business Energy Rebates business programs?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Not aware of program details	24	25	31	13	25	21	20	28	19	25	16	27	16	5	32	23	17	26	3	53
Haven't thought about/gotten around to it	11	12	9	11	13	6	10	6	18	9	21	11	9	11	11	10	17	18	14	7
No need, we already are energy efficient	10	9	15	8	14	1	8	14	6	12	3	8	18	19	6	10	12	8	16	2
Lack of information/Don't know enough about them	9	8	13	6	8	11	14	11	6	8	11	7	14	7	9	8	13	5	5	14
Company is too small	6	9	0	5	8	2	0	7	4	7	0	3	14	3	7	5	8	6	5	8
Too busy/No time to participate	6	5	3	11	6	8	0	6	6	5	11	8	2	12	3	9	0	2	10	0
Getting landlord approval	4	3	6	5	5	3	2	5	3	5	3	4	6	10	2	0	8	13	5	3
Low opinion of the value of energy efficiency/not seeing the potential benefits	4	5	6	2	4	3	10	6	2	5	3	4	5	4	4	7	0	0	6	2
Amount of time it took to do upgrades	3	4	3	2	4	2	0	3	4	4	0	4	2	5	3	4	0	5	6	0
Cost of upgrades	3	1	8	3	2	5	2	3	4	3	3	4	0	6	2	2	2	6	4	2
Didn't qualify/meet criteria	3	3	0	6	2	5	9	3	3	3	3	2	6	4	2	5	0	0	5	0
Lack of communication/They never followed up with us	3	4	1	2	2	6	2	2	4	3	3	2	3	1	3	2	3	5	5	0
Getting financing	1	0	0	2	1	0	0	0	1	1	0	1	0	2	0	1	0	0	1	0
Other	9	12	5	7	8	13	15	10	9	9	13	11	4	14	7	8	17	7	12	5
None/Nothing prevented us	2	1	3	4	2	3	2	1	3	1	4	3	0	2	2	1	3	2	2	0
Don't know/No answer	8	6	4	17	5	14	9	3	12	7	9	7	7	3	10	10	1	4	8	8
WEIGHTED SAMPLE SIZE (#)	**256**	**144**	**56**	**56**	**181**	**63**	**11**	**141**	**110**	**207**	**48**	**169**	**75**	**81**	**175**	**162**	**42**	**59**	**151**	**104**
UNWEIGHTED SAMPLE SIZE (#)	**239**	**119**	**56**	**64**	**119**	**72**	**48**	**116**	**118**	**188**	**51**	**157**	**67**	**75**	**164**	**163**	**39**	**43**	**143**	**95**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 26:

How likely is your company to participate in any of Efficiency Nova Scotia´s business programs in the future?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Definitely	16	13	23	18	15	20	20	16	16	15	21	19	9	24	13	19	9	13	16	17
Probably	54	60	48	43	53	56	53	54	53	53	59	55	51	45	57	50	67	58	52	55
Probably not	23	21	21	27	25	17	20	20	26	25	14	20	32	23	22	22	19	23	26	18
Definitely not	3	3	2	5	4	3	0	5	2	3	5	3	6	7	2	4	0	7	3	4
Don't know/No answer	4	2	6	6	4	4	7	4	3	4	1	3	3	0	6	5	4	0	3	5
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
% Definitely/Probably	70	73	71	61	68	76	73	71	70	68	80	74	60	69	70	69	76	71	68	72
% Probably not/Definitely not	26	24	23	33	28	20	20	25	27	28	19	22	38	31	24	26	19	29	29	23

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 27:

How familiar, if at all, would you say you are with Efficiency Nova Scotia´s programs made available to companies in the province?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Very familiar	5	6	1	4	5	4	7	4	6	4	6	4	6	16	0	5	4	5	8	0
Generally familiar	25	27	22	25	25	25	29	27	25	27	20	28	20	84	0	26	29	19	39	7
Not very familiar	36	34	41	37	35	42	33	29	46	34	46	35	39	0	52	35	38	43	40	32
Not at all familiar	33	32	36	34	35	30	31	40	24	34	28	33	34	0	48	34	30	32	13	60
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
% Very/Generally familiar	30	33	23	29	30	29	35	31	31	31	26	32	27	100	0	31	33	25	47	7
% Not very/Not at all familiar	70	67	77	71	70	71	65	69	69	69	74	68	73	0	100	69	67	75	53	93

TABLE 28:

[DO NOT ASK IF 'NOT AT ALL FAMILIAR' OR 'DON'T KNOW' IN Q27] What is your overall opinion of Efficiency Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Completely favourable	19	20	16	22	22	12	21	20	17	19	22	16	27	29	12	21	15	22	21	16
Mostly favourable	71	69	72	75	70	74	58	68	76	70	74	75	62	65	76	67	84	70	68	78
Mostly unfavourable	5	5	6	3	5	3	7	5	4	5	1	4	7	5	5	6	1	4	6	2
Completely unfavourable	1	1	0	0	0	2	0	1	0	0	3	1	0	0	1	1	0	0	1	0
Neither favourable nor unfavourable	3	3	6	0	2	4	6	4	1	4	0	3	3	2	4	3	0	3	3	4
Don't know/Not sure	2	2	1	1	0	5	9	2	2	2	0	2	1	0	3	2	0	1	2	0
WEIGHTED SAMPLE SIZE (#)	**178**	**100**	**37**	**41**	**125**	**46**	**8**	**91**	**85**	**141**	**38**	**118**	**50**	**81**	**97**	**111**	**31**	**42**	**131**	**46**
UNWEIGHTED SAMPLE SIZE (#)	**167**	**84**	**37**	**46**	**82**	**52**	**33**	**77**	**86**	**127**	**40**	**111**	**45**	**75**	**92**	**112**	**28**	**32**	**126**	**40**
% Completely/Mostly favourable	90	88	88	97	92	86	79	88	93	89	96	90	89	93	88	88	99	92	89	94
% Mostly/Completely unfavourable	5	6	6	3	5	5	7	6	4	5	4	5	7	5	6	7	1	4	6	2

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 30: TOTAL MENTIONS

Do you currently own, lease, or rent your primary business premises at your locations in Nova Scotia?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Own	63	55	69	77	60	68	83	61	66	61	71	61	66	65	62	100	4	9	68	57
Rent	23	29	21	12	28	13	4	25	20	23	24	25	19	19	25	3	0	100	21	27
Lease	16	21	8	14	16	19	15	13	20	16	20	17	15	18	16	1	100	0	15	17
Don't know/No answer	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

TABLE 31:

What is the primary heating source for your primary Nova Scotia business location?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Electricity	30	30	34	28	30	32	23	32	28	31	29	30	36	29	31	23	36	42	26	36
Oil	29	24	42	28	32	16	33	30	28	32	16	26	34	19	33	30	26	24	27	30
Heat pump	13	14	11	10	13	11	16	14	11	13	14	14	11	16	11	14	16	8	15	10
Natural Gas	7	13	2	0	3	20	2	4	11	7	11	10	3	9	7	8	9	7	7	8
Wood	6	4	7	9	8	2	4	7	5	5	10	5	10	7	6	10	0	0	7	5
Propane	4	6	0	3	2	8	9	3	5	3	7	5	2	4	4	3	3	6	4	4
Other	9	8	3	19	9	9	14	10	9	8	11	9	5	12	8	11	6	9	13	4
Don't know/No answer	1	1	1	2	2	1	0	1	2	1	3	2	0	4	0	0	3	3	1	1
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 32:

Does your company pay for its own electricity at your primary Nova Scotia locations, or does someone else, such as a landlord pay for it?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Yes, pay for own	91	88	96	92	91	90	96	91	93	91	91	90	92	89	92	95	77	90	91	91
Head office or other department pays	1	0	0	2	1	0	2	1	0	1	0	1	0	0	1	1	0	0	0	1
No, landlord pays	5	7	4	3	6	5	2	5	6	5	7	7	4	7	5	2	17	7	4	7
Other	3	4	0	2	2	5	0	4	2	3	2	3	4	5	2	2	6	2	4	1
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 33: TOTAL MENTIONS

In what specific business sector or industry is your company currently involved as its primary activity? Probe: Any others?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
Construction	13	14	12	11	15	7	10	9	18	14	7	12	15	12	13	16	1	14	14	11
Retail stores	13	9	18	17	14	11	8	16	7	12	16	12	15	14	12	10	19	15	13	13
Automotive services	12	12	15	8	14	8	4	14	9	13	5	10	17	11	12	11	10	15	10	13
Manufacturing	8	8	7	10	8	6	30	9	7	9	7	7	13	8	9	10	6	5	8	9
Restaurants	5	7	1	5	3	12	0	3	9	5	8	7	2	5	5	6	3	9	6	4
Transportation and storage	5	6	0	8	6	3	4	3	9	5	5	6	4	8	4	6	8	4	8	2
Business services	5	4	9	4	7	1	0	5	4	6	3	5	6	7	5	3	11	8	6	4
Professional services (law, engineering, architecture, etc.)	4	6	6	0	4	6	0	5	4	5	1	6	2	5	4	3	5	7	3	6
Property management	4	3	5	8	5	4	0	7	1	4	7	4	5	1	6	4	0	7	4	4
Agriculture & related services	4	4	0	7	4	3	15	6	2	4	4	4	5	3	5	6	4	0	3	6
Health care	4	4	4	1	2	7	2	2	6	4	2	4	2	1	5	3	2	5	3	4
Fisheries/Trapping	3	0	4	11	4	2	9	5	2	2	5	3	3	2	4	5	4	0	2	5
Financial services (banks/insurance)	3	4	2	2	2	5	0	1	6	2	9	4	1	2	4	2	9	4	3	3
Non-profit	2	2	1	5	2	3	2	2	2	2	5	1	2	3	2	3	3	2	4	1
Accommodations	2	2	5	1	2	5	0	2	2	3	0	3	1	4	2	4	0	0	2	2
Real estate	2	3	1	1	2	4	0	3	1	2	2	3	0	3	2	3	0	0	3	1
Recreation/Entertainment	2	1	4	1	1	5	2	1	3	2	2	2	2	2	2	1	8	0	3	1
Energy	2	1	2	2	2	0	0	1	3	1	6	2	2	2	2	2	3	0	2	1
Wholesale	2	2	1	0	2	1	2	2	1	2	0	2	0	2	1	0	9	0	1	2
Government	1	1	4	0	1	3	4	0	3	0	5	2	0	0	2	2	0	0	1	1
Communication & Other utility	1	2	0	0	1	2	0	0	1	1	0	1	1	0	1	1	0	3	0	2
Forestry & Logging	1	1	0	1	0	3	4	1	1	0	2	1	0	1	1	1	1	0	1	0
Grocers/Convenience stores	0	0	1	1	0	2	0	1	0	1	0	1	0	0	1	1	0	0	0	1
Other	14	16	5	15	13	16	12	16	10	15	10	13	15	14	13	14	15	11	8	21
No answer/Refused	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Non-Participants

TABLE 34:

To the best of your knowledge, approximately what percentage of your company´s operating budget for Nova Scotia locations is spent on energy costs?

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		FAMILIARITY WITH ENSC		LOCATION STATUS			AWARE OF ENS PROGRAMS?	
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Familiar	Not familiar	Own	Lease	Rent	Yes	No
1% - 4%	20	23	22	11	20	20	15	18	23	21	16	20	19	18	20	17	28	22	20	19
5% - 9%	12	7	16	20	11	11	20	10	14	11	17	13	12	13	11	16	7	3	14	9
10% - 14%	9	10	9	8	9	10	6	9	9	9	9	11	4	15	6	10	3	9	11	6
15%+	12	11	14	14	13	9	13	14	8	12	12	12	13	14	12	16	10	5	11	13
Don't know/No answer	47	50	39	48	46	50	46	48	46	48	47	44	53	40	50	42	53	60	44	53
WEIGHTED SAMPLE SIZE (#)	**268**	**148**	**58**	**62**	**192**	**65**	**11**	**153**	**111**	**215**	**52**	**177**	**76**	**81**	**187**	**169**	**44**	**62**	**151**	**117**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**121**	**59**	**70**	**126**	**75**	**49**	**125**	**119**	**195**	**54**	**164**	**69**	**75**	**175**	**170**	**40**	**45**	**143**	**106**
MEAN	9.5	9.8	8.1	10.3	9.2	10.0	10.7	10.1	8.4	9.2	10.1	9.5	9.5	10.4	9.0	10.5	7.6	6.8	9.7	9.1
MEDIAN	5.0	5.0	5.0	6.0	5.0	5.0	6.0	5.0	5.0	5.0	5.0	6.0	5.0	8.0	5.0	7.0	2.0	3.0	5.0	5.0

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 3:

How many full-time employees, including yourself, are currently working at your company´s operations within Nova Scotia?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
1-2	23	20	24	34	11	13	56	0	29	10	27	25	20	29	22	24	15	27	21	15	37	29	27
3-5	18	13	20	22	14	22	44	0	18	17	3	18	20	16	20	16	16	19	19	9	24	10	16
6-10	18	21	17	14	24	16	0	32	21	11	12	19	20	15	20	17	22	17	18	30	9	14	20
11-15	8	3	11	7	11	4	0	15	10	6	12	7	9	8	10	8	14	6	10	9	2	19	6
16+	31	41	27	24	38	45	0	54	22	51	46	30	30	32	27	35	32	30	31	37	27	28	31
Don't know/No answer	1	2	0	0	2	0	0	0	0	4	0	1	2	0	2	1	1	1	1	0	2	0	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
MEAN	13.8	17.7	12.4	10.8	17.6	15.5	2.6	22.8	10.1	24.7	23.8	12.9	14.2	13.1	13.3	14.4	14.3	13.8	14.8	15.3	12.4	12.3	14.5
MEDIAN	6.0	9.0	6.0	4.0	10.0	9.0	2.0	15.0	6.0	10.0	14.0	6.0	7.0	6.0	6.0	7.0	10.0	6.0	7.0	9.0	3.0	10.0	6.0

Note: Values greater than 100 were excluded from the calculation of the mean and median.

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 4:

And how many business locations does your organization currently have in Nova Scotia?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
1	70	65	73	74	64	78	79	64	100	0	60	71	68	73	68	72	72	70	67	70	69	81	66
2	8	7	8	5	10	11	6	8	0	26	12	7	9	5	9	6	9	7	10	0	9	9	8
3+	22	25	18	19	26	11	13	26	0	74	28	21	22	21	20	22	18	21	21	30	22	9	24
Don't know/No answer	1	2	1	1	1	0	1	1	0	0	0	2	2	0	2	0	1	1	2	0	0	1	3
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
MEAN	2.4	2.7	2.0	2.2	2.7	1.5	2.2	2.5	1.0	5.8	2.9	2.2	2.4	2.3	2.0	2.5	2.0	2.5	2.2	3.4	2.5	1.4	2.5
MEDIAN	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Note: Values greater than 20 were excluded from the calculation of the mean and median.

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 11: TOTAL MENTIONS

How did your business first learn of Efficiency Nova Scotia´s Business Energy Solutions, Small Business Energy Solutions Program, or its Business Energy Rebates Program?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Someone at Efficiency Nova Scotia contacted the business	20	22	19	18	22	18	19	21	18	21	15	18	22	17	23	17	23	19	20	22	13	10	19
Word of mouth	18	22	16	18	17	27	24	13	17	18	16	19	17	20	19	16	17	19	20	9	15	20	19
Through a third party contractor or service provider	13	10	15	14	12	24	9	16	12	17	10	14	11	16	9	17	8	15	17	7	7	22	17
Media advertising	10	4	14	11	10	11	11	10	10	13	9	12	10	11	11	10	6	12	9	4	22	16	12
Through the mail	6	3	7	5	6	9	5	6	7	4	9	6	5	6	6	5	7	5	7	2	2	7	5
Efficiency Nova Scotia website	5	6	5	7	3	7	3	7	6	4	18	4	6	4	4	6	8	4	4	6	9	0	9
Don't recall/Never heard of any of these programs	5	2	6	8	2	2	11	1	6	4	12	5	5	6	5	5	5	4	5	0	11	0	6
Internet (in general)	4	5	4	5	2	0	6	3	5	1	0	6	6	0	9	0	6	3	4	4	4	0	7
Participation in another Efficiency Nova Scotia program	2	4	1	3	1	0	0	3	1	1	0	3	3	0	4	0	1	2	3	0	0	4	3
Facebook or other social media	1	2	1	1	2	2	2	1	2	1	0	2	1	2	2	1	1	2	1	6	2	3	1
Store where new equipment was purchased	1	4	1	1	2	0	1	2	1	4	0	1	2	1	3	0	2	1	1	2	4	1	1
The business contacted Efficiency Nova Scotia program options	1	4	0	1	1	2	0	2	0	1	3	1	2	0	2	0	1	1	2	0	0	0	4
Home show	1	0	2	1	1	0	0	2	2	0	0	0	0	3	0	2	0	2	2	0	0	4	0
Building management	0	1	0	0	1	2	0	1	0	1	0	1	1	0	1	0	0	1	1	0	0	0	1
Received direct mail from Efficiency Nova Scotia	0	1	0	0	1	0	0	1	1	0	3	0	1	0	1	0	0	1	1	0	0	0	0
Other	11	12	10	9	12	9	4	15	8	19	9	9	13	7	15	7	12	10	11	19	5	13	9
Don't know/No answer	14	16	13	16	12	13	14	15	14	15	18	14	14	15	8	19	15	15	12	22	17	13	5
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 15: FIRST MENTION

What is the single most important reason why your company decided to participate in one or more Efficiency Nova Scotia business programs?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Wanted the energy savings/reduce power bill	73	63	77	74	71	73	68	78	73	72	61	73	74	71	72	73	76	72	73	74	70	79	71
Efficiency Nova Scotia would pay part of the costs/rebates/incentives	7	9	6	8	6	7	7	7	6	9	0	9	8	5	9	6	3	9	7	9	4	7	10
Wanted to make our location more comfortable	5	6	5	7	3	7	10	2	7	0	6	6	3	9	4	6	5	6	5	4	6	6	6
Wanted to be environmentally friendly	4	5	3	3	6	4	3	4	3	6	6	4	5	3	5	3	6	3	4	2	4	0	2
Wanted/Needed to upgrade equipment	3	5	2	3	2	0	3	3	3	1	15	1	3	1	2	3	4	2	2	2	6	3	4
Improve efficiency of business/building	1	0	1	1	0	4	2	0	1	0	6	0	0	2	0	1	0	1	1	0	0	0	3
The 24 month interest free financing on our power bill	0	0	1	0	1	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	0	0	0
Other	5	6	5	3	8	4	5	5	4	7	3	4	4	8	7	4	4	5	6	6	2	3	4
Don't know/No answer	2	6	0	1	2	2	3	0	1	4	3	2	2	2	1	3	2	2	1	2	6	3	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 15: TOTAL MENTIONS

What is the single most important reason why your company decided to participate in one or more Efficiency Nova Scotia business programs? Probe: Anything else?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Wanted the energy savings/reduce power bill	81	74	84	82	79	84	74	87	81	78	67	83	83	76	81	81	88	78	81	85	74	85	77
Wanted to be environmentally friendly	19	22	18	20	19	7	13	24	17	23	21	19	22	15	19	20	20	20	19	13	30	15	14
Efficiency Nova Scotia would pay part of the costs/rebates/incentives	17	17	17	16	17	13	15	18	14	23	12	19	18	15	18	16	13	19	18	13	17	15	29
Wanted to make our location more comfortable	12	17	10	15	9	9	18	8	16	1	15	13	10	16	12	12	12	13	11	17	11	19	16
Wanted/Needed to upgrade equipment	5	7	4	4	6	7	5	5	5	4	15	4	5	5	6	4	7	4	5	5	6	6	7
Improve efficiency of business/building	3	1	4	3	3	5	3	3	3	4	9	2	1	5	3	3	3	2	3	2	9	3	4
The 24 month interest free financing on our power bill	0	0	1	0	1	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	0	0	0
Other	9	9	10	4	16	11	6	11	8	13	3	8	10	8	14	6	9	9	10	9	7	8	7
Don't know/No answer	2	6	0	1	2	2	3	0	1	4	3	2	2	2	1	3	2	2	1	2	6	3	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 16: FIRST MENTION

What was the main benefit, if any, to your company from participating in an Efficiency Nova Scotia business program?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Energy savings/reduce power bill	54	49	57	47	62	71	49	59	52	60	61	60	68	34	60	50	66	50	56	61	39	50	48
Efficiency Nova Scotia paid part of the costs/rebates/incentives	12	18	10	12	13	4	13	12	13	13	15	10	12	14	9	16	12	12	15	11	4	18	13
Improved energy efficiency of business/building	5	6	4	5	4	4	4	5	5	5	15	3	3	8	2	7	4	6	5	0	6	7	9
Could not have done upgrades/made purchases without rebates	4	5	4	5	2	5	5	3	5	0	6	5	4	5	8	1	3	5	5	0	4	3	7
Location more comfortable	4	6	3	5	2	2	7	2	6	0	0	5	2	8	2	5	4	4	3	2	6	5	8
More environmentally friendly	3	7	1	4	1	0	2	3	3	2	0	4	2	3	4	1	4	2	3	0	4	0	1
Other	8	5	9	8	7	7	7	7	8	7	3	6	5	12	9	7	5	9	6	15	11	10	7
None/Did not see any benefits	5	0	7	5	3	7	7	3	3	9	0	3	2	8	4	5	2	3	3	7	13	1	6
Don't know/No answer	5	4	5	7	4	0	5	6	6	5	0	4	3	10	2	7	1	8	4	4	11	5	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 16: TOTAL MENTIONS

What was the main benefit, if any, to your company from participating in an Efficiency Nova Scotia business program? Probe: Any others?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Energy savings/reduce power bill	65	60	67	59	70	78	55	72	65	66	71	69	78	44	71	60	80	59	68	70	46	63	63
Efficiency Nova Scotia paid part of the costs/rebates/incentives	16	23	13	18	15	7	18	15	16	14	26	13	18	14	14	18	18	15	17	15	11	21	18
Location more comfortable	10	8	11	14	6	9	13	8	12	6	12	10	9	11	10	10	11	10	10	7	9	15	16
More environmentally friendly	10	13	9	9	11	5	5	13	10	11	6	11	11	9	11	9	11	10	11	11	9	5	11
Improved energy efficiency of business/building	8	11	7	9	7	7	7	9	10	5	15	7	7	10	6	10	8	8	7	13	6	12	14
Could not have done upgrades/made purchases without rebates	6	5	6	7	4	9	7	5	6	2	6	7	5	7	9	3	5	6	7	0	4	7	7
The 24 month interest free financing on our power bill	0	0	1	0	1	0	0	1	1	0	0	1	1	0	0	1	1	0	1	0	0	0	0
Other	11	11	10	9	12	7	8	12	12	9	6	10	9	13	12	10	11	11	8	26	11	13	13
None/Did not see any benefits	5	0	7	5	3	7	7	3	3	9	0	3	2	8	4	5	2	3	3	7	13	1	6
Don't know/No answer	5	4	5	7	4	0	5	6	6	5	0	4	3	10	2	7	1	8	4	4	11	5	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 17: FIRST MENTION

What was the primary challenge, if any, your company experienced in participating in an Efficiency Nova Scotia business program?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Too much paperwork	6	4	7	5	7	5	3	8	4	10	4	8	6	6	3	9	3	8	6	6	6	6	6
Cost of upgrades	6	7	5	5	6	7	8	4	6	4	9	5	4	9	3	8	3	7	5	4	9	3	3
Long process/Length of time for approval	4	8	3	5	3	2	6	3	5	3	6	3	5	4	7	2	5	4	3	6	6	1	7
Amount of time it took to do upgrades	4	6	4	4	4	9	3	5	3	7	3	4	4	4	3	5	3	5	4	2	7	2	4
Not happy with upgrades	3	0	4	4	1	2	5	1	2	4	0	2	2	2	2	3	2	2	2	2	6	0	4
Not informed on what equipment was covered/qualified	2	0	2	1	2	2	1	2	2	3	0	2	2	1	2	1	0	3	3	0	0	3	3
Poor/Lack of communication	2	0	3	0	4	0	2	2	2	1	0	2	1	4	2	2	0	3	2	2	0	1	4
Having to close during upgrades	1	0	1	1	0	2	0	1	1	0	0	1	1	0	2	0	0	1	1	0	0	0	3
Getting landlord approval	1	1	1	0	2	0	0	1	1	1	0	1	1	1	1	1	1	1	1	2	0	0	3
Getting financing	1	0	1	1	0	0	0	1	1	0	0	1	0	2	0	1	0	1	0	0	4	0	0
Cost over-runs	1	0	1	1	0	0	2	0	1	0	0	1	1	0	2	0	0	1	0	0	4	3	0
Other	9	13	7	7	11	9	6	10	7	10	6	8	11	5	11	7	10	8	9	9	9	17	10
None/Did not experience any challenges	58	55	60	58	59	60	59	58	60	55	72	58	59	58	60	58	73	52	62	61	39	61	51
Don't know/No answer	4	5	2	5	2	2	5	3	4	2	0	4	4	4	2	3	1	5	2	4	9	3	2
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 17: TOTAL MENTIONS

What was the primary challenge, if any, your company experienced in participating in an Efficiency Nova Scotia business program? Probe: Anything else?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Too much paperwork	6	5	7	5	7	5	3	9	4	11	4	8	7	6	3	9	3	8	6	6	6	6	7
Cost of upgrades	6	7	5	5	6	11	8	4	7	4	9	5	4	9	3	8	3	7	5	4	9	3	3
Long process/Length of time for approval	5	8	4	7	4	2	8	4	6	4	6	4	6	4	9	3	5	6	3	6	13	4	7
Amount of time it took to do upgrades	5	8	4	5	4	9	3	7	4	7	3	5	5	4	5	5	5	5	4	6	7	2	7
Poor/Lack of communication	3	2	3	1	4	0	4	2	3	1	0	2	1	6	2	3	0	4	2	6	0	4	4
Not happy with upgrades	3	0	4	4	1	2	5	1	2	4	0	2	2	2	2	3	2	2	2	2	6	0	4
Not informed on what equipment was covered/qualified	2	0	2	1	2	2	1	2	2	3	0	2	2	1	2	1	0	3	3	0	0	3	3
Having to close during upgrades	1	0	1	1	0	2	0	1	1	0	0	1	1	0	2	0	0	1	1	0	0	0	3
Getting landlord approval	1	1	1	0	2	0	0	1	1	1	0	1	1	1	1	1	1	1	1	2	0	0	3
Getting financing	1	0	1	1	0	0	0	1	1	0	0	1	0	2	0	1	0	1	0	0	4	0	0
Bad advice about energy efficiency upgrades	1	0	1	1	0	0	0	1	0	2	0	1	0	2	0	1	0	1	1	0	0	0	3
Cost over-runs	1	0	1	1	0	0	2	0	1	0	0	1	1	0	2	0	0	1	0	0	4	3	0
Upgrades took longer than expected	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	9	13	7	7	11	9	6	10	7	10	6	8	11	5	11	7	10	8	9	9	9	17	10
None/Did not experience any challenges	58	55	60	58	59	60	59	58	60	55	72	58	59	58	60	58	73	52	62	61	39	61	51
Don't know/No answer	4	5	2	5	2	2	5	3	4	2	0	4	4	4	2	3	1	5	2	4	9	3	2
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 18:

And has there been a significant reduction, modest reduction, or no reduction at all in your company´s energy use as a result of these upgrades arising from your participation in an Efficiency Nova Scotia business program?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Significant reduction	12	12	13	14	11	13	9	15	11	17	100	0	16	7	14	11	17	11	13	11	13	15	13
Modest reduction	57	58	56	55	58	56	57	57	60	46	0	84	63	47	60	55	60	57	62	44	44	52	55
No reduction at all	11	12	11	14	8	9	13	9	8	18	0	16	4	24	5	16	4	12	9	13	22	7	18
Don't know/No answer	20	19	20	18	23	22	21	19	21	19	0	0	18	23	21	18	20	21	16	33	22	25	13
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

TABLE 19:

[ASK IF 'SIGNIFICANT' OR 'MODEST' REDUCTION IN Q18] And would you say that the reductions in energy use achieved as a result of these efficiency upgrades have been more than expected, less than expected, or were they about as expected?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
More than expected	7	9	6	4	11	11	6	8	8	4	30	2	8	5	8	7	8	7	6	4	15	4	15
Less than expected	10	16	7	10	10	5	17	5	10	8	0	12	9	11	11	9	6	11	9	4	15	8	13
About as expected	82	75	85	84	80	82	74	87	80	87	70	85	82	83	79	85	86	80	83	92	69	87	72
There were no expectations	1	0	2	2	0	0	3	0	1	0	0	1	1	0	2	0	0	2	1	0	0	0	0
Don't know/No answer	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**172**	**53**	**117**	**91**	**77**	**4**	**68**	**103**	**124**	**46**	**31**	**141**	**122**	**50**	**84**	**87**	**59**	**113**	**126**	**23**	**24**	**45**	**44**
UNWEIGHTED SAMPLE SIZE (#)	**172**	**53**	**117**	**51**	**83**	**38**	**58**	**113**	**122**	**48**	**30**	**142**	**124**	**48**	**83**	**89**	**62**	**110**	**132**	**23**	**19**	**46**	**48**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 20:

And 'yes' or 'no,' did your company monitor its energy consumption closely after its participation in Efficiency Nova Scotia´s small business programs?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Yes, did monitor energy consumption closely	58	55	59	55	61	45	52	63	53	67	94	57	63	47	64	52	61	56	57	58	61	64	75
No, did not monitor energy consumption closely	39	41	38	41	36	53	46	34	45	27	6	42	34	48	32	46	34	41	41	31	39	29	25
Don't know/No answer	3	4	3	4	2	2	3	3	2	6	0	1	2	5	4	3	5	3	2	11	0	7	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

TABLE 21:

And has there been a significant reduction, modest reduction, or no reduction at all in your company's NS Power electricity bill as a result of efficiency upgrades arising from your participation in an Efficiency Nova Scotia business program?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Significant reduction	6	10	5	5	7	9	4	8	4	10	49	0	8	3	8	4	8	5	5	11	6	7	6
Modest reduction	54	54	55	54	55	47	52	57	59	42	34	72	64	39	59	51	62	53	59	40	46	53	55
No reduction at all	24	23	25	27	20	24	32	18	25	23	12	24	12	42	18	29	9	29	21	30	37	28	28
Don't know/No answer	16	14	16	14	18	20	13	18	12	25	6	4	15	16	15	16	21	12	15	19	11	12	12
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 22:

[ASK IF 'SIGNIFICANT' OR 'MODEST' REDUCTION IN Q21] And would you say that the reductions in electricity bills achieved as a result of these efficiency upgrades have been more than expected, less than expected, or were they about as expected?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
More than expected	9	12	8	5	13	16	7	10	10	5	30	4	11	2	10	8	14	6	9	9	8	7	12
Less than expected	7	7	7	9	5	0	13	4	8	5	0	9	6	12	6	9	0	11	6	4	17	4	12
About as expected	83	81	84	84	81	84	78	86	80	90	70	86	82	86	82	84	86	81	84	87	75	88	76
There were no expectations	1	0	2	2	0	0	3	0	2	0	0	1	2	0	2	0	0	2	2	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**151**	**49**	**101**	**78**	**69**	**3**	**57**	**93**	**110**	**38**	**25**	**121**	**112**	**39**	**77**	**75**	**54**	**97**	**109**	**21**	**22**	**40**	**39**
UNWEIGHTED SAMPLE SIZE (#)	**150**	**51**	**97**	**44**	**75**	**31**	**50**	**99**	**107**	**41**	**27**	**118**	**111**	**39**	**73**	**77**	**55**	**95**	**112**	**22**	**18**	**39**	**40**

TABLE 23:

And based on your experience, how likely are you to recommend Efficiency Nova Scotia business programs to other companies? Would you definitely, probably, probably not, or definitely not recommend these programs to others?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Definitely	62	71	58	59	64	75	60	63	60	65	79	61	100	0	84	44	88	52	64	59	52	61	56
Probably	31	27	33	34	29	20	30	33	33	28	21	32	0	84	14	45	12	39	31	35	32	34	37
Probably not	4	2	5	5	3	2	9	1	5	3	0	5	0	12	0	8	0	7	3	4	9	4	2
Definitely not	1	0	2	1	2	2	2	1	1	4	0	2	0	4	2	1	0	1	2	0	2	1	4
Don't know/No answer	1	0	1	0	2	2	0	1	1	1	0	0	0	0	1	1	0	1	0	2	4	0	1
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
% Definitely/Probably	93	98	91	93	93	95	89	96	94	93	100	93	100	84	98	90	100	91	94	94	85	94	93
% Probably not/Definitely not	6	2	8	7	5	4	11	3	6	6	0	7	0	16	2	10	0	8	5	4	11	5	6

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 24: TOTAL MENTIONS

[DO NOT ASK IF 'DEFINITELY' IN Q23] What would make you more likely to recommend Efficiency Nova Scotia business programs to other companies? Probe: Anything else?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Better energy savings/Lower power bill	15	21	13	17	12	14	19	11	13	18	0	20	0	14	30	11	19	13	14	10	18	14	20
More information about ENS programs generally	13	8	15	17	9	7	21	7	16	7	27	11	0	13	24	11	0	14	13	5	23	11	10
If the programs were beneficial to companies	13	20	12	20	5	7	19	9	11	21	27	12	0	14	10	15	10	12	13	20	14	17	28
Better/Higher incentives/rebates	13	17	12	13	12	14	11	14	9	21	0	14	0	13	15	12	10	14	12	5	18	21	4
Easier process/Easier to implement	6	0	8	3	9	0	0	10	5	7	0	7	0	6	0	7	0	7	9	0	5	7	0
Improved communication/follow-up	3	0	4	0	7	0	2	3	3	4	0	3	0	3	5	2	0	3	5	0	0	0	7
Provide tool for monitoring consumption	2	4	1	0	5	7	0	3	3	0	0	0	0	2	5	1	10	1	2	5	0	4	3
If other companies ask/If it came up in conversations	1	0	2	0	2	21	0	2	2	0	2	2	0	1	6	0	10	0	2	0	0	1	4
Other	9	5	10	7	12	7	9	9	11	4	14	7	0	9	5	10	10	7	7	11	9	4	7
Nothing	2	8	0	3	0	7	0	3	3	0	0	3	0	2	0	3	0	2	3	0	0	0	0
Don't know/No answer	27	17	29	23	33	21	21	32	29	22	30	24	0	28	0	32	42	27	23	42	23	26	19
WEIGHTED SAMPLE SIZE (#)	**95**	**22**	**71**	**53**	**40**	**2**	**42**	**53**	**69**	**26**	**7**	**65**	**0**	**93**	**18**	**75**	**9**	**80**	**61**	**18**	**20**	**26**	**28**
UNWEIGHTED SAMPLE SIZE (#)	**87**	**20**	**66**	**30**	**43**	**14**	**29**	**58**	**63**	**24**	**7**	**60**	**0**	**84**	**17**	**69**	**11**	**73**	**59**	**17**	**15**	**26**	**25**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 25:

How often, if at all, does your company promote your energy efficiency in your communications or marketing?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Always	6	7	6	4	9	4	5	7	4	11	6	8	7	6	9	4	7	6	6	13	0	7	6
Usually	8	11	5	9	6	4	11	5	6	11	10	9	9	6	10	6	12	6	9	2	9	4	7
Sometimes	21	19	23	16	27	25	18	24	19	27	33	17	25	15	24	20	23	21	20	26	24	17	28
Rarely	19	19	18	23	15	24	22	18	20	15	30	16	21	17	23	16	15	22	18	20	22	21	15
Never	44	44	46	47	41	40	42	47	49	34	21	49	37	56	33	55	41	45	46	39	45	51	44
Don't know/No answer	1	0	1	0	2	4	1	1	1	1	0	1	1	0	2	0	3	0	1	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
% Always/Usually	14	18	11	14	15	7	17	12	11	22	16	17	15	12	19	10	19	12	15	15	9	11	13
% Rarely/Never	64	63	64	70	56	64	64	64	69	50	51	66	58	73	55	71	55	67	65	59	67	72	59

TABLE 26:

How likely is your company to participate in any of Efficiency Nova Scotia´s business programs in the future?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Definitely	46	52	43	47	44	44	46	45	45	46	54	43	62	19	100	0	68	35	49	41	33	49	46
Probably	47	41	50	45	50	51	41	52	49	44	46	47	37	64	0	88	31	55	45	55	48	43	46
Probably not	5	5	5	5	5	4	9	2	5	6	0	7	2	11	0	10	1	6	4	4	9	7	4
Definitely not	1	2	1	1	2	2	2	1	2	1	0	2	0	4	0	3	0	2	1	0	6	1	4
Don't know/No answer	1	0	0	1	0	0	2	0	0	2	0	0	0	2	0	0	0	1	0	0	4	0	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
% Definitely/Probably	93	93	93	92	93	95	88	97	94	90	100	91	98	83	100	88	99	91	94	96	80	92	91
% Probably not/Definitely not	7	7	7	7	7	5	11	3	6	7	0	9	2	15	0	12	1	8	6	4	15	8	9

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 28:

What is your overall opinion of Efficiency Nova Scotia?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Completely favourable	31	38	28	23	40	35	23	36	32	28	42	29	43	10	46	18	100	0	34	39	9	33	24
Mostly favourable	64	58	67	72	56	58	70	60	65	63	58	65	56	78	52	75	0	97	61	61	80	66	64
Mostly unfavourable	2	2	1	1	2	4	4	0	2	1	0	2	0	4	0	3	0	2	1	0	5	0	4
Completely unfavourable	1	0	1	0	2	2	0	1	1	1	0	1	0	2	0	1	0	1	1	0	2	1	1
Don't know/Not sure	3	1	3	4	1	2	3	2	1	6	0	3	1	6	2	3	0	0	3	0	4	0	7
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
% Completely/Mostly favourable	95	96	94	95	96	93	93	97	97	91	100	93	99	88	98	93	100	97	95	100	89	98	87
% Mostly/Completely unfavourable	2	2	2	1	3	5	4	1	2	3	0	3	0	6	0	4	0	3	2	0	7	2	6

TABLE 30: TOTAL MENTIONS

Do you currently own, lease, or rent your primary business premises at your locations in Nova Scotia?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Own	67	55	74	68	66	91	66	69	65	71	70	71	69	66	73	64	74	64	100	7	2	71	69
Lease	17	28	12	14	21	7	10	22	17	17	15	14	16	18	15	19	22	15	2	100	2	18	17
Rent	17	18	15	20	13	4	24	11	17	18	18	16	14	19	12	20	5	22	1	2	100	12	18
Don't know/No answer	1	0	1	0	2	0	1	1	1	0	0	0	1	0	1	1	1	1	0	0	0	0	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 31:

What is the primary heating source for your primary Nova Scotia business location?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Electricity	26	19	28	26	26	24	34	20	24	30	22	22	27	24	27	23	20	28	23	32	28	25	22
Oil	25	18	29	26	25	27	21	29	28	21	27	25	18	37	25	26	22	26	27	11	31	31	27
Heat pump	15	10	17	19	11	11	18	13	17	9	29	16	20	7	17	14	18	14	18	11	6	11	17
Propane	11	6	12	8	14	4	5	14	10	14	12	11	9	13	8	13	10	12	9	15	13	11	13
Natural Gas	9	27	2	11	7	9	7	11	9	9	6	11	12	4	11	8	13	8	7	13	13	5	13
Wood	1	0	2	1	1	7	2	1	1	1	0	1	1	1	2	1	3	1	2	0	0	1	0
Other	11	14	10	8	14	16	11	11	10	14	4	10	12	10	9	13	14	10	12	15	4	12	6
Don't know/No answer	2	6	0	1	2	2	2	1	2	3	0	3	1	3	1	3	1	2	1	2	4	3	1
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

TABLE 32:

Does your company pay for its own electricity at your primary Nova Scotia locations, or does someone else, such as a landlord pay for it?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Yes, pay for own	95	94	96	96	93	96	96	94	97	89	97	96	96	92	97	94	96	95	99	87	87	97	99
Head office or other department pays	1	1	1	0	2	2	0	1	1	1	0	1	1	1	1	1	1	1	0	2	2	1	0
No, landlord pays	4	2	3	4	3	2	4	3	2	7	0	3	2	6	2	4	1	4	0	9	11	1	0
Other	1	2	0	0	2	0	0	1	0	3	3	1	1	1	1	1	1	1	1	2	0	0	1
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 33: TOTAL MENTIONS

In what specific business sector or industry is your company currently involved as its primary activity? Probe: Any others?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
Retail stores	26	14	30	26	27	9	30	23	27	24	33	25	25	29	25	26	22	29	27	26	30	35	21
Restaurants	10	11	9	4	17	0	7	11	11	9	0	9	12	7	10	10	7	11	5	22	15	6	13
Manufacturing	8	10	7	9	4	45	9	7	9	5	8	9	4	15	4	12	5	7	9	0	13	11	9
Construction	8	8	8	12	2	5	11	5	6	13	9	9	6	11	10	6	4	9	10	0	4	8	7
Automotive services	7	8	7	5	10	0	4	10	9	4	9	8	6	8	7	7	17	3	5	13	9	10	4
Property management	7	7	7	8	5	7	7	6	3	15	3	9	8	3	9	5	5	8	8	7	2	3	13
Health care	5	7	5	7	4	0	2	8	6	5	3	6	6	4	4	7	5	6	4	6	9	7	0
Recreation/Entertainment	4	5	4	3	7	0	4	4	4	5	6	3	6	1	7	2	9	2	4	4	2	0	7
Grocers/Convenience stores	4	4	5	3	7	0	5	4	6	0	0	6	4	6	5	4	4	5	4	4	6	5	6
Financial services (banks/insurance)	4	2	5	5	3	0	1	6	1	12	6	5	6	2	5	4	6	4	5	4	2	0	1
Accommodations	4	2	5	3	6	0	5	3	5	3	6	3	2	7	3	5	1	5	6	0	0	1	8
Transportation and storage	3	5	2	3	2	4	0	4	3	3	0	3	3	2	4	1	5	2	4	0	0	8	0
Business services	3	0	4	4	1	0	2	3	2	4	12	0	3	2	3	2	2	3	1	4	6	3	3
Agriculture & related services	2	0	3	1	2	15	2	2	2	2	0	3	3	1	3	2	3	2	3	0	0	3	2
Non-profit	2	6	1	3	2	0	4	1	3	0	0	2	2	2	2	2	1	3	2	4	0	3	4
Real estate	2	4	2	3	2	0	4	1	2	4	0	3	3	1	4	1	2	2	3	0	0	3	0
Wholesale	2	5	1	1	2	0	0	3	2	3	0	2	1	3	1	3	2	2	2	0	2	3	0
Fisheries/Trapping	2	0	2	3	0	7	0	3	1	3	0	2	1	2	0	3	3	0	2	0	0	0	6
Government	1	2	1	1	1	7	0	2	0	1	3	1	2	0	3	0	0	2	2	0	0	0	3
Energy	1	0	2	1	1	4	0	2	2	0	0	1	1	1	2	1	0	2	2	0	0	2	3
Professional services (law, engineering, architecture, etc.)	1	2	1	0	2	2	0	2	1	1	3	1	1	1	2	1	3	1	1	2	0	3	2
Communication & Other utility	0	0	1	0	1	0	1	0	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1
Other	10	10	11	8	13	9	11	10	12	8	15	8	11	9	9	12	13	9	10	11	9	11	10
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Participants

TABLE 34:

To the best of your knowledge, approximately what percentage of your company´s operating budget for Nova Scotia locations is spent on energy costs?

	OVERALL	REGION		NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		ENERGY USE		RECOMMEND ENSC		FUTURE PARTICIPATION		OPINION OF ENSC		LOCATION STATUS			PCT OF BUDGET SPENT ON ENERGY	
		Halifax County	Rest of NS	10	11	21	1-5	6+	1	2+	Sig reduction	LT sig reduction	Definitely	LT definitely	Definitely	LT definitely	Comp favourable	LT comp favourable	Own	Lease	Rent	5% or less	6% or more
1% - 4%	20	19	21	19	21	22	19	21	25	8	27	18	20	20	20	20	23	20	20	28	13	76	0
5% - 9%	11	8	12	9	12	15	10	11	11	9	15	9	9	13	12	9	9	12	10	13	9	24	16
10% - 14%	6	10	4	4	8	9	4	8	7	5	6	7	8	3	7	6	6	6	7	2	7	0	24
15%+	16	16	16	19	12	15	20	13	12	21	13	18	12	22	15	16	10	17	17	11	19	0	60
Don't know/No answer	48	48	47	49	47	40	48	47	45	56	39	49	51	42	46	49	52	47	46	46	52	0	0
WEIGHTED SAMPLE SIZE (#)	**250**	**76**	**169**	**132**	**112**	**6**	**103**	**144**	**174**	**73**	**31**	**169**	**155**	**93**	**114**	**134**	**77**	**167**	**169**	**42**	**42**	**66**	**64**
UNWEIGHTED SAMPLE SIZE (#)	**250**	**76**	**170**	**74**	**121**	**55**	**90**	**157**	**175**	**73**	**30**	**167**	**163**	**84**	**112**	**137**	**84**	**161**	**180**	**40**	**33**	**68**	**67**
MEAN	10.2	12.2	9.4	10.0	10.5	9.4	11.0	9.7	8.9	14.2	7.5	11.9	9.0	11.9	9.6	10.8	8.6	10.4	10.4	7.4	13.1	2.7	18.0
MEDIAN	5.0	8.0	5.0	5.0	6.0	5.0	7.0	5.0	5.0	12.0	5.0	8.0	5.0	6.0	5.0	6.0	5.0	6.0	5.0	4.0	10.0	3.0	15.0

Corporate Research Associates Inc., 2017
[ENS001-1054]

EFFICIENCY NOVA SCOTIA CORPORATION

2017 SBES Study - Incidence Table

TABLE X:

Incidence of participation in ENS programs. Derived from survey questions Q8 and Q9.

Participant:
Code 1 ('Yes, has participated in one or more of these programs') in Q9, or
Code 7 ('Did participate, but unsure which one') in Q9

Non-Participant:
Code 2 ('No, did not participate prior to 2017') in Q8, or
Code 8 ('Don't know/No answer') in Q8, or
Code 2 ('No, has not participated in any of these programs') in Q9, or
Code 8 ('Don't know/No answer') in Q9

	OVERALL	NSPI REGION			NSPI RATE CODE			NUMBER OF FTEs		NUMBER OF LOCATIONS		LIGHTING EQUIPMENT INSTALLED?		LOCATION STATUS		
		Central	Eastern	Western	10	11	21	1-5	6+	1	2+	Yes	No	Own	Lease	Rent
PARTICIPANT	24	22	24	29	18	36	39	18	32	23	30	31	7	26	23	18
NON-PARTICIPANT	76	78	76	71	82	64	61	82	68	77	70	69	93	74	77	82
WEIGHTED SAMPLE SIZE (#)	**355**	**190**	**77**	**88**	**235**	**102**	**19**	**187**	**163**	**279**	**74**	**256**	**82**	**230**	**57**	**76**
UNWEIGHTED SAMPLE SIZE (#)	**355**	**167**	**84**	**104**	**155**	**119**	**81**	**162**	**187**	**273**	**80**	**260**	**75**	**248**	**56**	**58**

Corporate Research Associates Inc., 2017
[ENS001-1054]

Small Business Energy Study

March 2017

Prepared by: EfficiencyOne

Contents

1 Introduction 1
2 Background 1
3 Review of Current ENS Programs 2
3.1 Direct Installation (SBES) 2
3.1.1 SBES Parameters and Qualifications for Participation 2
3.1.2 SBES Evolution 5
3.1.3 Barriers to Participation 7
3.1.4 Participation Rates 9
3.2 Efficient Product Rebates (BER) 20
3.2.1 BER Parameters and Qualifications for Participation 20
3.2.2 BER Evolution 24
3.2.3 Barriers to Participation 24
3.2.4 Participation Rates 26
3.3 Outreach 33
3.3.1 How Participants Know About SBES and BER 33
3.3.2 Contacts to the promotional channels 35

Figures

Figure 1: SBA Representation of Rate Classes 10, 11, and 21 9
Figure 2: BES - Number of Eligible Accounts 10
Figure 3: BES 2014-2015 Participation Rates for SBA Accounts 10
Figure 4: 2014 BES Projects Completed 11
Figure 5: 2015 BES Projects Completed 11
Figure 6: BES Participation by Projects, Businesses, and Facilities 12
Figure 7: BES Rate Class 10 Participation by Projects, Businesses, and Facilities 12
Figure 8: BES Rate Class 11 Participation by Projects, Businesses, and Facilities 13
Figure 9: BES Rate Class 21 Participation by Projects, Businesses, and Facilities 13
Figure 10: BES Rate Classes 10, 11, and 21 Participation - Unknown Annual Consumption 13
Figure 11: BES Participation by Projects per Rate Class 14
Figure 12: BES Rate Class Breakdown of Completed Projects 14
Figure 13: SBES - Number of Eligible Accounts 15
Figure 14: SBES 2015-2016 Participation Rates for SBA Accounts 15
Figure 15: 2015 SBES Projects Completed 16
Figure 16: 2016 SBES Projects Completed 16
Figure 17: SBES Participation by Projects, Businesses, and Facilities 17
Figure 18: SBES Rate Class 10 Participation by Projects, Businesses, and Facilities 17
Figure 19: SBES Rate Class 11 Participation by Projects, Businesses, and Facilities 18
Figure 20: SBES Rate Class 21 Participation by Projects, Businesses, and Facilities 18
Figure 21: SBES Participation by Projects per Rate Class 19

Figure 22: SBES Rate Class Breakdown of Completed Projects 19
Figure 23: BER Mail-in - Number of Eligible Accounts 27
Figure 24: BER Mail-in 2014-2016 Participation Rates for SBA Accounts 27
Figure 25: 2014 BER Mail-in Projects Completed 28
Figure 26: 2015 BER Mail-in Projects Completed 28
Figure 27: 2016 BER Mail-in Projects Completed 29
Figure 28: BER Mail-in Participation by Projects, Businesses, and Facilities 29
Figure 29: BER Mail-in Rate Class 10 Participation by Projects, Businesses, and Facilities 30
Figure 30: BER Mail-in Rate Class 11 Participation by Projects, Businesses, and Facilities 30
Figure 31: BER Mail-in Rate Class 21 Participation by Projects, Businesses, and Facilities 30
Figure 32: BER Mail-in Rate Classes 10, 11, and 21 Participation - Unknown Annual Consumption 31
Figure 33: BER Mail-in Participation by Projects per Rate Class 31
Figure 34: BER Mail-in Rate Class Breakdown of Completed Projects 32

Tables

Table 1: SBES Participation Barriers and Mitigation Strategies 8
Table 2: SBA Representation of Rate Classes 10, 11, and 21 9
Table 3: BER Participation Barriers and Mitigation Strategies 25
Table 4: Contacts to the Promotional Channels 35

Attachments

Attachment A: ENS Response to CRA Small Business Energy Research Recommendations

1 INTRODUCTION

The Small Business Energy Study (the "Study") consists of the following two parts:

i. A review of the core Efficiency Nova Scotia ("ENS") programs that are available to businesses which fall within the purview of the Small Business Advocate ("SBA");[1] and

ii. The results of a survey that evaluated, among other things, why small businesses do or do not participate in efficiency programs.

EfficiencyOne produced the first part of this Study and retained Corporate Research Associates (CRA) to conduct the second part, which included a survey of small businesses and the ensuing report and recommendations (provided alongside this document). Please refer to Attachment A for ENS's response to these recommendations.

2 BACKGROUND

During the 2016-2018 DSM Resource Plan regulatory process, the SBA requested that EfficiencyOne undertake a Small Business Energy Study with the scope to be developed in consultation with the SBA. Through the stakeholder Settlement Agreement dated 16 June 2015 (referred to as the "Quantum Agreement"), EfficiencyOne agreed to undertake this Study.[2]

Although the Quantum Agreement was not approved by the Nova Scotia Utility and Review Board (the "UARB"), the corresponding UARB Decision indicated its understanding that "the non-financial provisions of the Quantum Agreement will be pursued by E1, NSPI and other stakeholders…."[3]

EfficiencyOne and the SBA collaborated to develop the Scope of Work for the Study in 2016. Pursuant to a Request for Proposals process, CRA was awarded the contract for the survey component of the Study in the fall of 2016. The Study was conducted in the winter of 2017.

[1] Small businesses that: i) consumes less than 150,000kWh of electricity/year; ii) are located within Nova Scotia; and iii) fall within NS Power rate codes 10, 11, and 21.

[2] M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix C, Appendix "A", item 6 (available on CanLII).

[3] *Ibid* at para 27.

3 REVIEW OF CURRENT ENS PROGRAMS

This section reviews the core ENS programs that are available to small businesses within the SBA's purview. These programs are Direct Installation (comprised of the Small Business Energy Solutions program component and hereafter referred as "SBES") and Efficient Product Rebates (comprised of the Business Energy Rebates program component and hereafter referred to as "BER").

3.1 DIRECT INSTALLATION (SBES)

SBES is administered by EfficiencyOne through its ENS franchise. SBES works to offer small businesses in Nova Scotia incentives and resources to enable them to make energy-efficient upgrades within their organizations. ENS may cover up to 60 percent of the cost of energy-efficient upgrades pursued through SBES.

Feedback from small businesses has indicated that SBES participants have limited technical, financial and staff resources to explore energy-efficient opportunities at their facilities. SBES provides opportunities, resources, and support to help overcome these barriers and maximize participants' return on investment.

SBES goals include the following:

- provide a participant-centric service delivery model;
- help participants make smart energy upgrades;
- offer incentives for participants that require extra support;
- maximize energy savings per participant transaction;
- increase participants' profitability and comfort; and
- create opportunities for growth in the energy efficiency industry.

The following analysis reviews the SBES program component parameters and qualifications, program component evolution, barriers to participation, and participation rates.

3.1.1 SBES Parameters and Qualifications for Participation

The following seven steps detail the parameters and qualification requirements for SBES.

Step 1: To participate in SBES, businesses must complete a Business Profile. This is an online questionnaire that provides information on, among other things, the company, the primary facility concerned, how the applicant would prefer to receive their rebate (if eligible), and utility information. Based on this information, SBES staff determine if the business qualifies to participate in SBES and, if so, whether a free electrical energy audit would help identify potential energy-saving upgrades for the

participant.[4] If SBES staff determine that a participant qualifies for SBES but does not require a free energy audit, the participant can participate in SBES through the 'do it yourself' path.

To qualify for participation in SBES, a business must meet i) the SBES definition of a "small business" and ii) eligible project criteria.

Small Business Definition

The eligibility criteria for SBES participants are broader than the definition of small businesses that fall under the purview of the SBA. Under SBES, small businesses must:

- have an NS Power rate code of 04, 10, 11, 21, or a Small General Municipal Electric Utility rate code;
- have an annual electrical energy consumption of less than 350,000 kWh; and
- be located within Nova Scotia.

Consequently, SBES benefits small businesses that fall within the SBA's purview, as well as broader range of small businesses. 2016 SBES statistics indicate that 68 percent of SBES projects are completed by small businesses that fall within the SBA's purview (NS Power rate codes 10, 11, and 21 with an annual electrical energy consumption of less than 150,000 kWh).

Eligible Project Criteria

In addition to participant qualifications, SBES also has project eligibility criteria. Eligible projects must meet the following requirements:

- projects must involve the purchase and installation of products that are eligible for SBES rebates (measure eligibility is based on the products found on the most recent SBES rebate worksheets, available at efficiencyns.ca/SBES);
- measures must be new and installed prior to receiving a financial incentive;
- projects must save electrical energy; and
- energy and demand savings from the project cannot exceed the actual usage provided by NS Power (non-utility supply, such as cogeneration, self-generation, or deliveries from another commodity supplier do not qualify as usage from NS Power), or the relevant fuel service provider.

Step 2: Provided that the above thresholds are met, ENS will provide audit participants with guidance on how to maximize their electricity bill savings (non-audit participants proceed directly to step 3).

[4] Free-of-charge electrical energy audits include: interviews with operating and/or maintenance staff; a complete inspection of the facility to identify potential energy efficiency improvements; an estimate of the installed costs and energy savings from the recommended improvements; the completion of the mandatory ENS audit template forms; a review of the resulting ENS Opportunities Report with the SBES participant via email, phone and/or in person; and ensuring the participant is aware of the Efficiency Trade Network (ETN) to facilitate any other services the participant may require. The ETN is discussed further under Step 3.

Step 3: the participant then determines the electrical energy saving upgrades they are interested in pursuing and selects a contractor.[5] To help make this a seamless process, ENS maintains an Efficiency Trade Network ("ETN"), which is a directory of local professionals who can help with energy efficiency improvements, including contractors, insulation installers, heating system installers, and electricians.

Step 4: With help from the selected contractor, the participant submits their documentation to ENS for approval of the projects they wish to pursue. This includes:

- completing worksheets for the products the applicant plans to install;
- requesting quote(s) for product(s) and labour;
- providing specification sheet(s) for each of the products being upgraded; and
- payment information to receive the applicable rebate(s) and financing.[6]

The participant emails this documentation to sbesconsent@efficiencyns.ca or faxes it to 902-470-3599 and receives approval from SBES staff before installing their upgrades. Approval is typically provided within 5 business days.

Step 5: Once approved, the participant can purchase and install their energy-efficient upgrades. The SBES approval details the following:

- the participant's eligible rebates;
- a summary of how much money the participant can expect to save on their electricity bills;
- the participant's estimated payback period; and
- interest-free financing information to help cover the cost of the upgrades.

Step 6: Within 90 days of installing the approved upgrades, the business must:

- submit photos of the installed products(s);
- include receipts or invoices for the product(s); and
- provide receipts or invoices for labour.

The participant emails the above information to sbesconsent@efficiencyns.ca or faxes it to 902-470-3599, along with their business name and contact details.

[5] Some participants may already have a contractor selected at this phase, as participants often learn about SBES through a contractor who could have been involved since the participant completed their Business Profile.

[6] If a participant is an NS Power customer, they can also choose to pay their remaining portion via interest-free payments on their power bill, subject to NS Power credit approval. In this case, ENS will provide the participant with a financing agreement and a summary of the financing and rebate amounts. Upon receipt of the financing agreement and subject to NS Power credit approval, NS Power will include the financing on the participant's next billing cycle. Finance lengths can be up to 24 months. When a participant chooses to finance their portion of the energy-efficient upgrades in this manner, ENS provides the participant with a rebate cheque for the full amount of the project and then recovers the participant's portion via their interest-free payments on their NS Power bill.

Step 7: The participant receives their rebate(s). SBES staff reimburse participants with their approved payment amount within 30 days of the application being verified. Depending on the project, ENS may cover up to 60 percent of the cost of energy-efficient upgrades. Rebates are provided by mailed cheque or direct deposit, depending on the participant's preference.

ENS is required to have a third party evaluation performed annually to determine eligible savings. These reports are filed with the UARB and subsequently reviewed by an independent verifier who is hired by the UARB. The latest evaluation reports can be found on the UARB website.

3.1.2 SBES Evolution

SBES has undergone several changes in the last few years. These changes can be broken into three phases:

Phase I: Pre-August 1, 2015 (Business Energy Solutions or "BES");
Phase II: August 1, 2015 (BES became SBES); and
Phase III: Fall 2015 (SBES further refined).

Phase I:

Before August 1, 2015, SBES was known as BES. Under BES, a "small business" was defined as any non-residential participant (except for multi-unit residential buildings) with a total annual electricity use of less than 400,000 kWh.

Under the BES framework, ENS offered small businesses across Nova Scotia complete turnkey implementation services for qualifying energy-efficient upgrades. This meant that recommended measures were implemented by delivery agents under contract with ENS, preventing the small business from, for example, choosing their preferred contractor (as this would be handled by ENS). This turnkey service also included a free on-site energy assessment of energy-efficient measures.

Phase II:

On August 1, 2015, SBES replaced BES as ENS's small business offering.[7] Four core changes took place between BES and SBES:

- SBES is offered to a narrower range of businesses:
    - under SBES, the annual electricity usage threshold was lowered from 400,000 kWh/year to 350,000 kWh/year. This change was made further to a jurisdictional scan of other small business programs and a data analysis of past BES participants.
    - certain facilities that were eligible under BES were no longer eligible under SBES. These facilities were: facilities owned or operated by an educational institution; healthcare facilities; national or multi-national retailers, hospitality or financial institutions (locally owned franchises were eligible); and provincial and federal government facilities

[7] BES participants were able to complete their projects within the year.

(facilities owned and operated by a municipality within Nova Scotia were eligible). This change was reverse under Phase III, discussed below.

- SBES introduced an open market framework, whereby efficiency upgrades can be performed by any qualified contractor selected by the participant. This change to an open market from the turnkey services under BES was made to enable participants to choose their own contractors and to help grow the local economy. Having more contractors involved in SBES broadens the choices available to participants when selecting their preferred contractor, materials, and distributor.
- SBES introduced free energy audits for qualifying small businesses. SBES made these audits available in recognition of the barriers that small businesses face when making smart energy-efficient choices. Two of these core barriers are capital funding and lack of education. A complimentary professional energy audit helps overcome these barriers.
- Incentives are lower under SBES, where they cover a maximum of 60 percent of the project cost, versus the general 80 percent limit (or 100 percent under certain circumstances) under BES. This change was made in an effort to reduce the unit cost for SBES.

Phase III:

In the fall of 2015, ENS further refined SBES to reopen it to the following small businesses facilities that were eligible under BES:

- facilities owned or operated by an educational institution;
- healthcare facilities;
- national or multi-national retailers, hospitality, or financial institutions (locally owned franchises were eligible); and
- government facilities: provincial and federal (facilities owned and operated by a municipality within Nova Scotia were eligible).

ENS made these changes to mitigate the risk associated with making assumptions regarding a business's financial need in the absence of proof of income.

The change to a new delivery model in 2015 led to a decrease in SBES savings as potential participants learned about the new delivery structure. To assist participants, the SBES team increased outreach efforts in 2016 and engaged an industrial engineering firm to improve internal processes by decreasing the cycle time and simplifying the participant experience. To continue raising awareness of the new delivery model, SBES staff engage with ENS partners and the ETN on an ongoing basis to outline changes to the program component and provide training materials to aid members.

3.1.3 Barriers to Participation

As part of its evaluation process, ENS's external evaluator conducts participant interviews to gather feedback on, among other things, barriers to participating in SBES. Typical barriers, as determined through evaluation reports and ongoing communication with potential SBES participants, are highlighted in Table 1 below, alongside the associated mitigation strategies.

Table 1: SBES Participation Barriers and Mitigation Strategies

Barrier	Mitigation Strategy	Result of Mitigation Strategy
Financial: Small businesses often lack sufficient capital resources to pursue energy-efficient projects.	SBES offers rebates of up to 60 percent of the cost of an approved energy-efficient project as well as financing to overcome capital resource barriers. SBES is one of ENS's only program components that offers both rebates and financing to participants, recognizing the unique financial needs of small businesses. SBES also offers a complimentary energy audit to qualifying small businesses to help overcome the financial barriers associated with learning about energy-efficient opportunities.	SBES participants rely on these financing options and the free energy audit to overcome financial barriers.
Lack of information: Lack of education regarding energy-efficient projects.	Eligible participants receive complimentary energy audits to provide direct and complementary access to quality information on how to complete an energy efficiency project. SBES staff increased outreach efforts in 2016 and engage regularly with distributors (vendors), contractors, and consultants to increase awareness of the program component. Instructional training videos and other educational materials are provided to ETN members to facilitate completing the necessary participation forms, and educational materials are distributed to potential SBES participants. Finally, ENS staff serve as ambassadors to promote energy efficiency to small businesses (see section 3.3, "Outreach", below).	Offering complimentary energy audits directly addresses the lack of information barrier. After increasing outreach efforts in 2016 to assist participants with the new delivery structure, ENS observed a notable upturn in SBES participation rates.
Lack of resources: Small businesses may lack sufficient resources to	The SBES team focuses on opportunities for process improvements for both the contractor and the participant. In 2016, ENS worked with an industrial engineering firm to improve	After the launch of these process improvements, SBES observed an increase in applications, participation

complete SBES paperwork and project management, including hiring a contractor, and pursuing quotes for eligible projects.	internal processes by decreasing the cycle time and simplifying the participant's experience. ENS launched the implementation of these process improvements on August 1, 2016.	numbers and claimed energy savings. SBES has been trending upwards since the launch of these process improvements.

3.1.4 Participation Rates

This section provides a compilation of figures and tables that review BES and SBES participation numbers from 2014-2016. Since SBES (and its predecessor BES) underwent substantial change in 2015, reliable trends are not yet established.

Figure 1 and Table 2, below, are intended to provide contextual information on the number of NS Power Accounts that fall within the SBA's purview, for the purpose of informing the following analysis. This information is based on the NS Power commercial customer listing.

Figure 1: SBA Representation of Rate Classes 10, 11, and 21

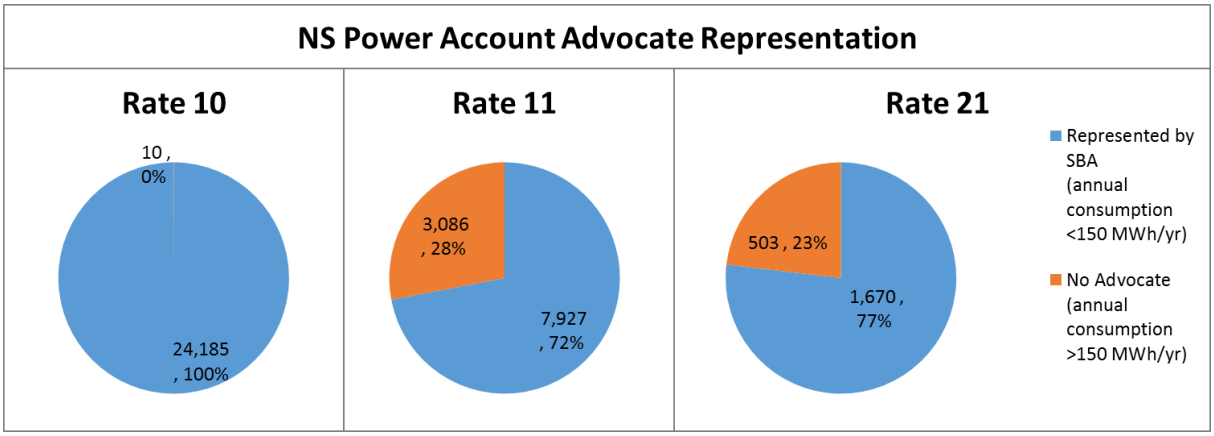


Table 2: SBA Representation of Rate Classes 10, 11, and 21

	Number of NS Power Accounts Within the SBA's Purview*	Number of NS Power Accounts NOT Within the SBA's Purview**
Rate Class 10	24,185	10
Rate Class 11	7,927	3,086
Rate Class 21	1,670	503

* Based on annual consumption of <150,000 kWh/year.

** Based on annual consumption of >150,000 kWh/year.

Figure 2 shows that all facilities within the SBA's purview were eligible for BES and that these accounts comprised 85 percent of all eligible BES participants. Figures 3 through 5 show the proportion of BES projects completed by rate class. The decrease in participation levels between 2014 and 2015 can be attributed to: i) BES ending mid-year (August 1, 2015); and ii) a significant decrease in ENS's (then Efficiency Nova Scotia Corporation's) budget in 2015.

Figure 2: BES - Number of Eligible Accounts

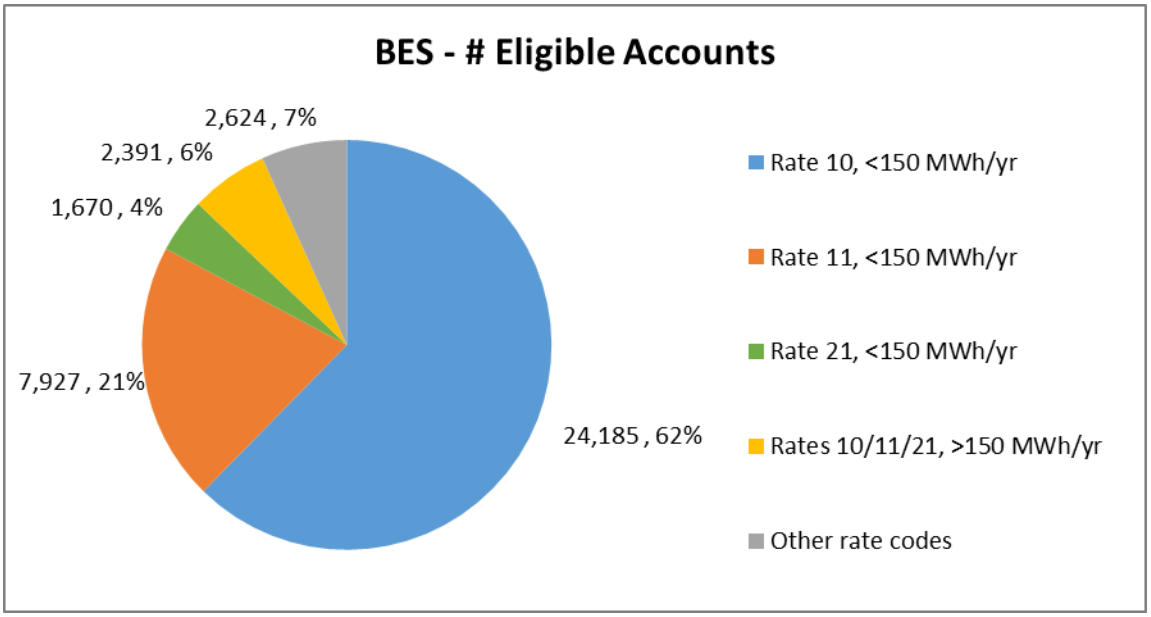


Figure 3: BES 2014-2015 Participation Rates for SBA Accounts

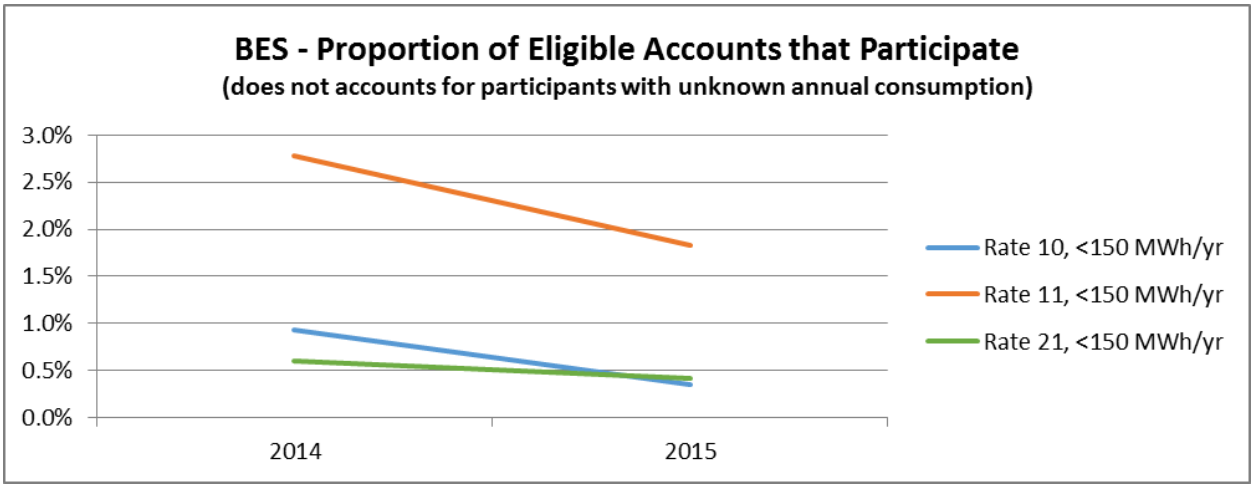


Figure 4: 2014 BES Projects Completed

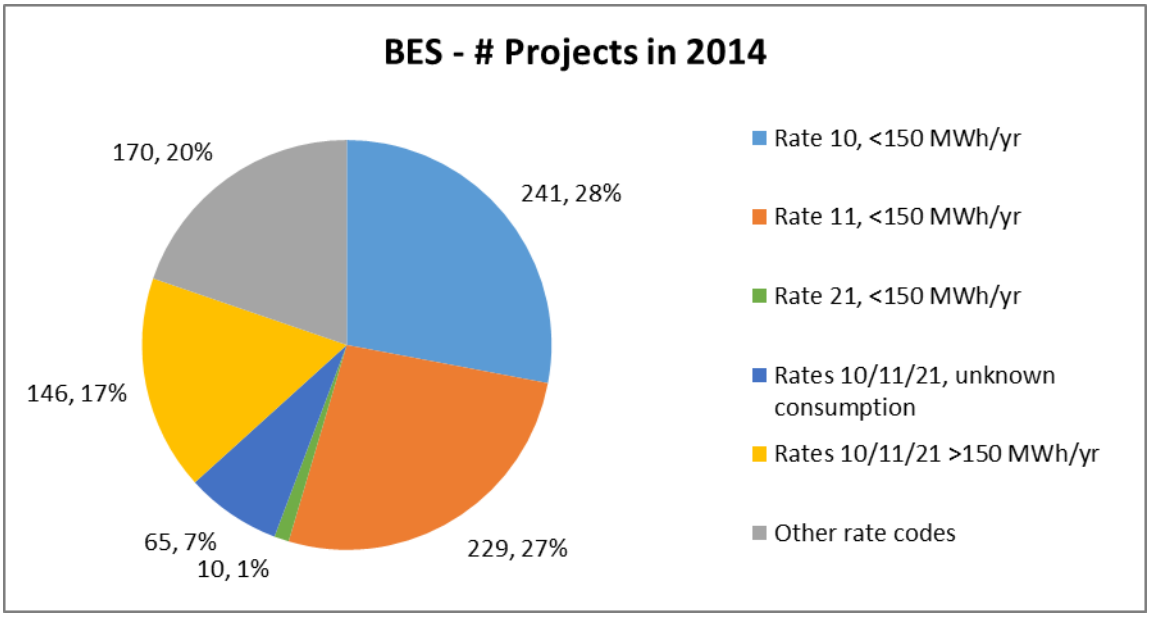


Figure 5: 2015 BES Projects Completed

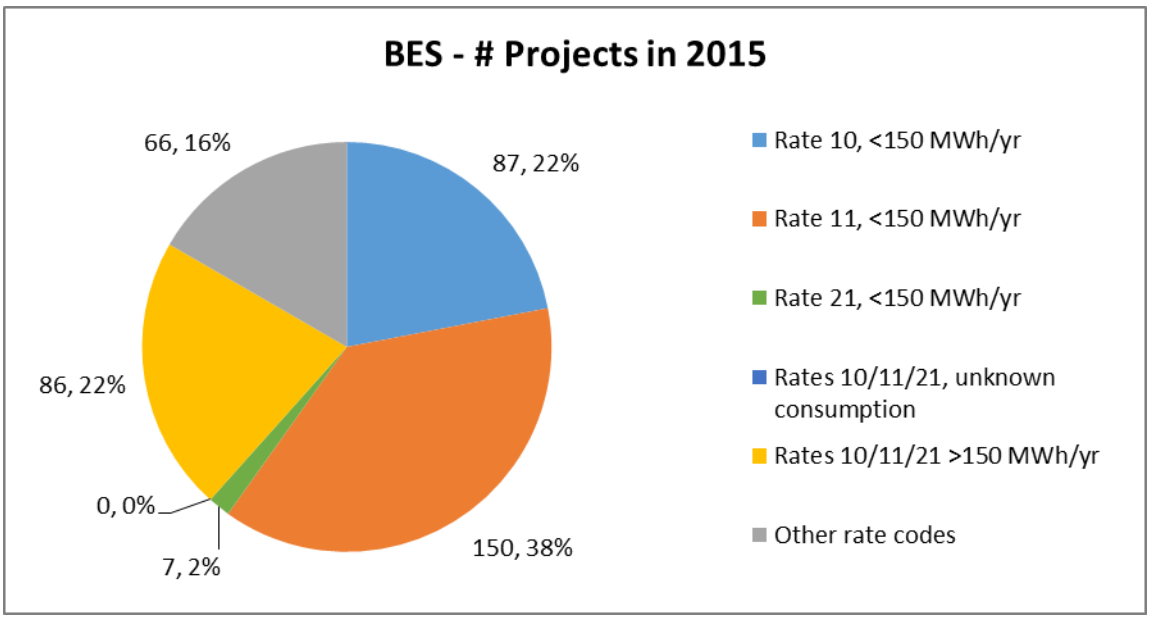


Figure 6 demonstrates BES participation levels by number of projects, businesses, and facilities, while Figures 7 through 10 provide increased granularity to display BES participation numbers within the SBA's rate classes.[8]

[8] "Businesses" are a count of unique company names, and "Facilities" are a count of unique project site addresses.

Figure 6: BES Participation by Projects, Businesses, and Facilities

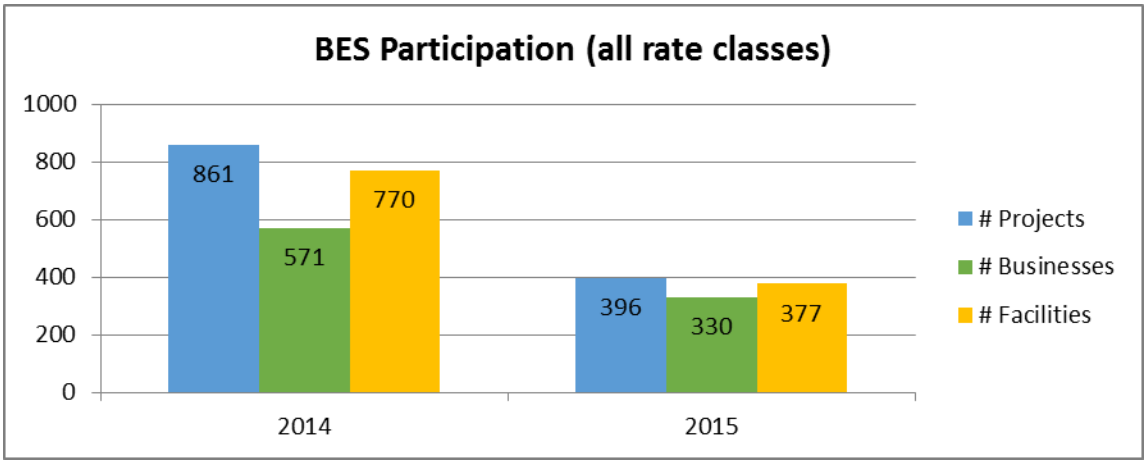


Figure 7: BES Rate Class 10 Participation by Projects, Businesses, and Facilities

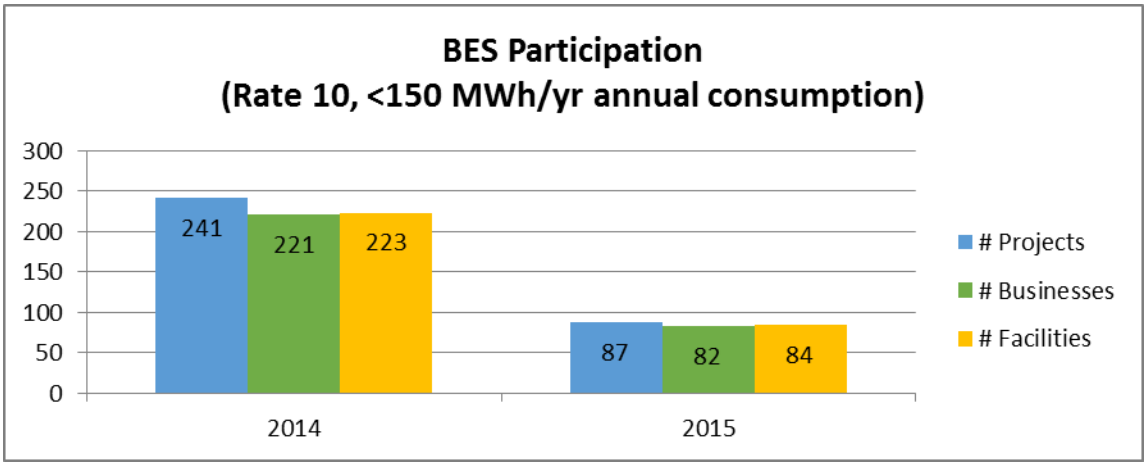


Figure 8: BES Rate Class 11 Participation by Projects, Businesses, and Facilities

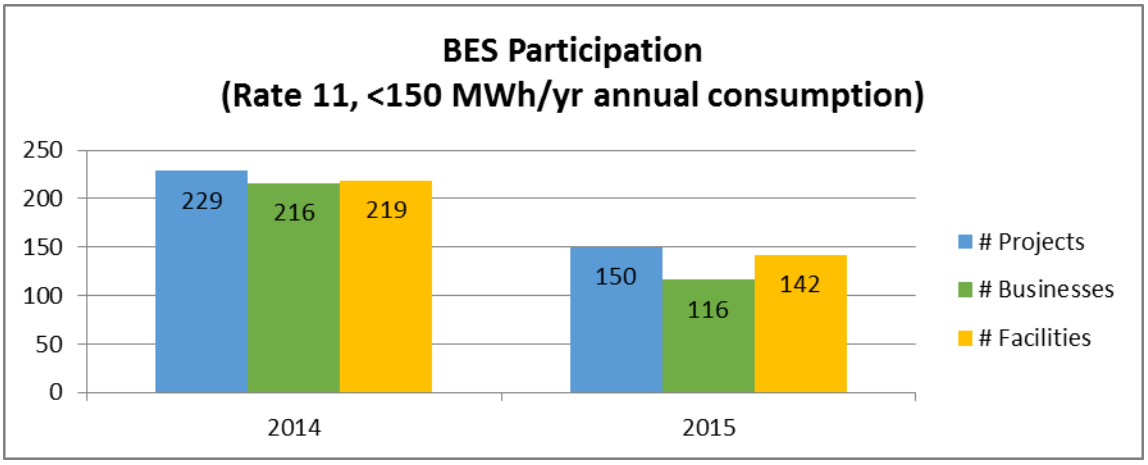


Figure 9: BES Rate Class 21 Participation by Projects, Businesses, and Facilities

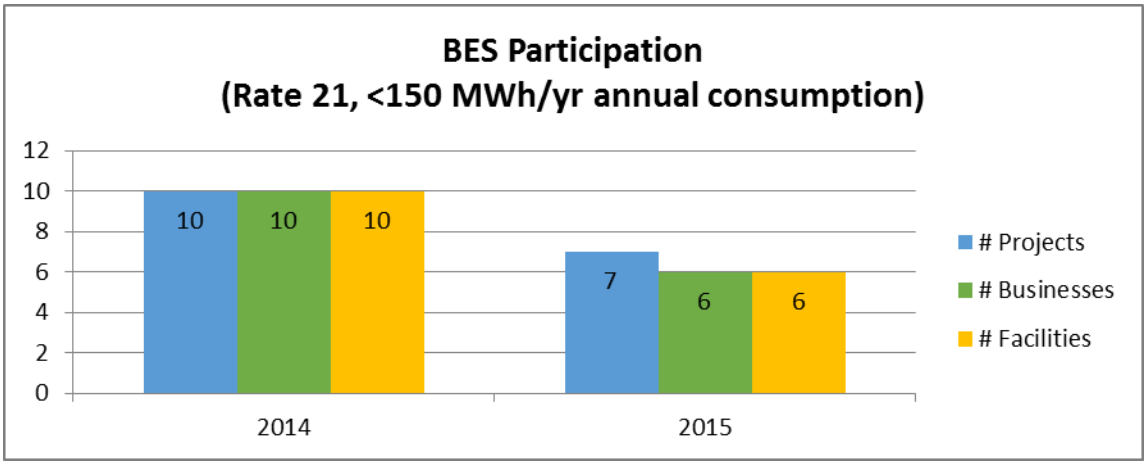
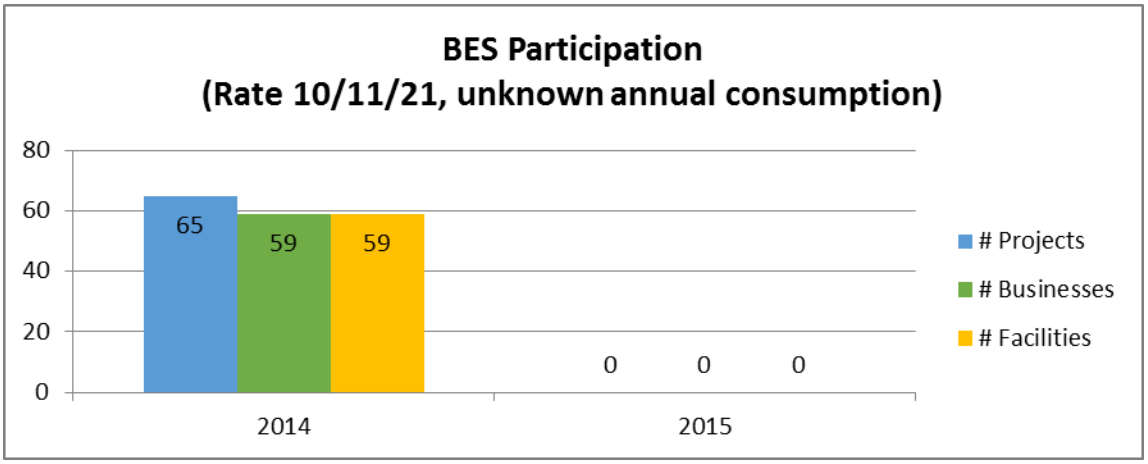


Figure 10: BES Rate Classes 10, 11, and 21 Participation - Unknown Annual Consumption



Figures 11 and 12 provide a high-level overview comparing the number of BES projects completed between rate classes and year-over-year.

Figure 11: BES Participation by Projects per Rate Class

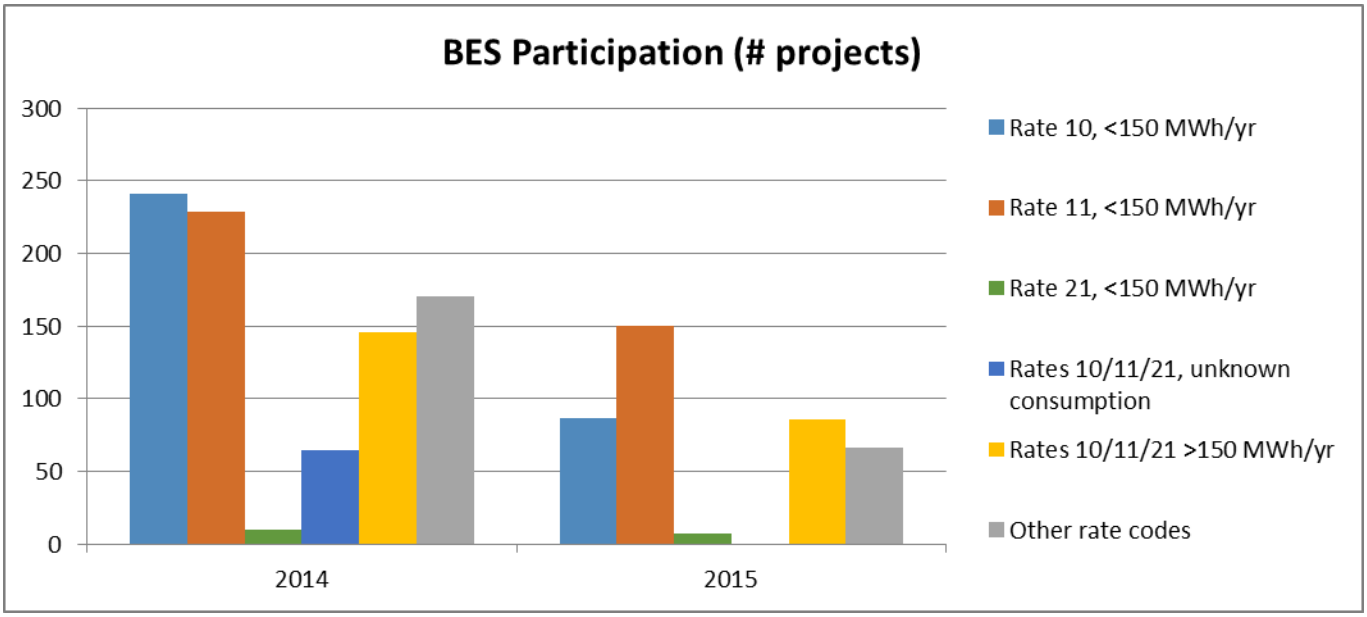


Figure 12: BES Rate Class Breakdown of Completed Projects

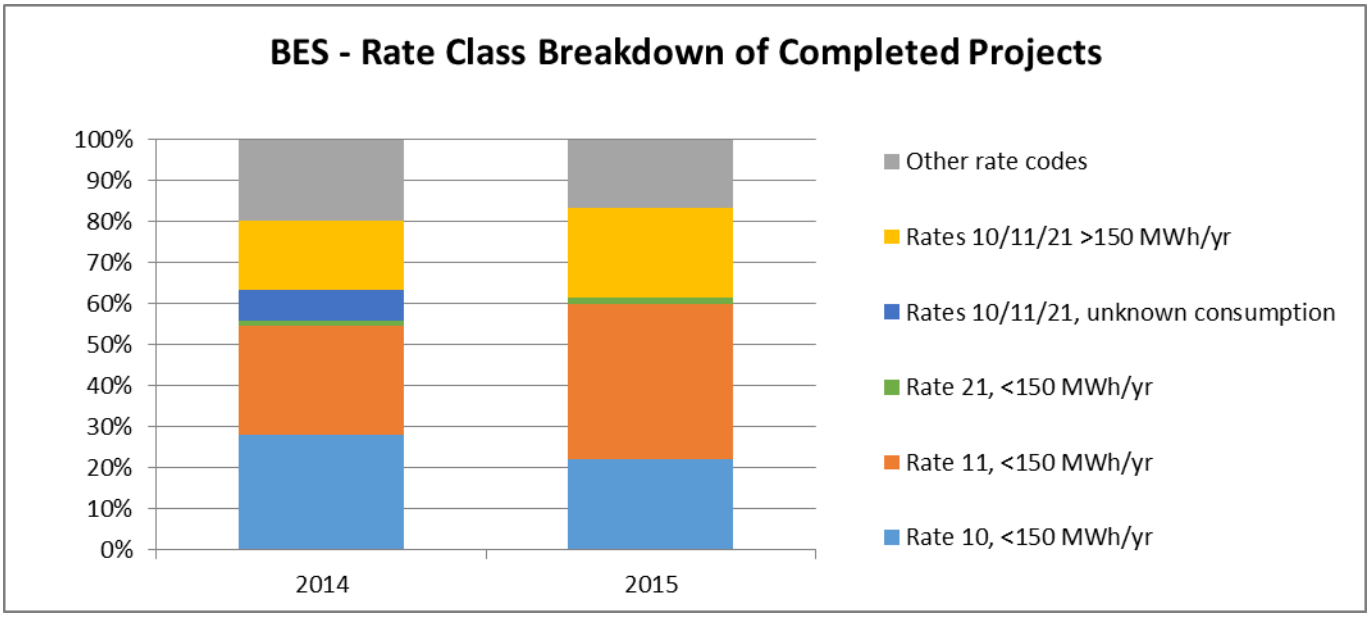


Figure 13 demonstrates that, as was the case under BES, all businesses within the SBA's purview are eligible for SBES (comprising 87 percent of all eligible SBES accounts), while Figures 14 through 16 demonstrate the proportion of those eligible accounts that participated in SBES in 2015 and 2016.

Figure 13: SBES - Number of Eligible Accounts

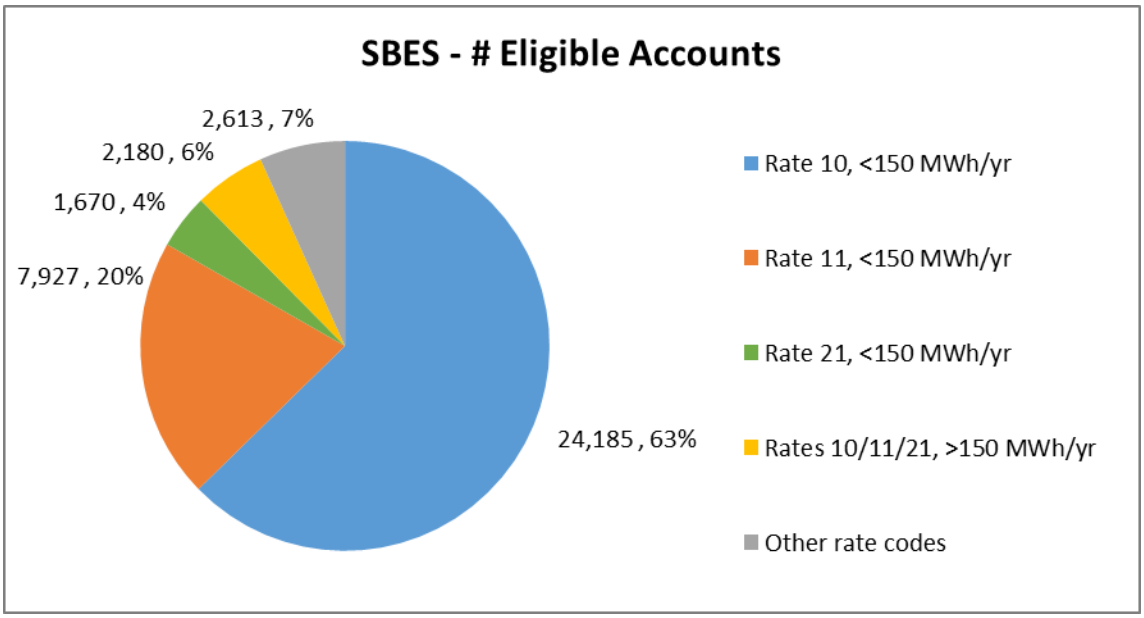


Figure 14: SBES 2015-2016 Participation Rates for SBA Accounts

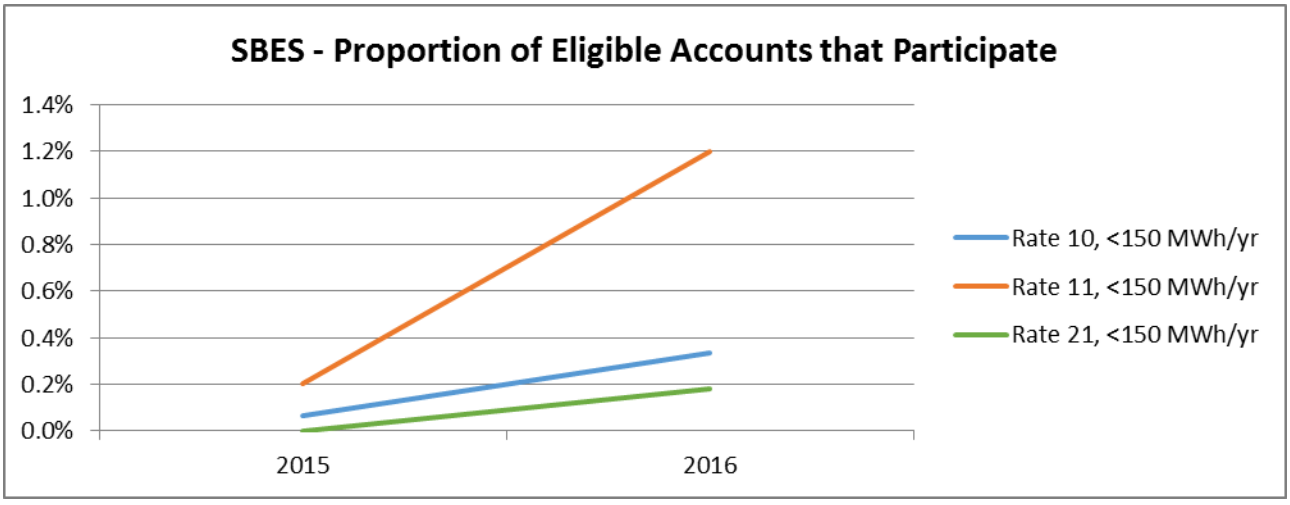


Figure 15: 2015 SBES Projects Completed

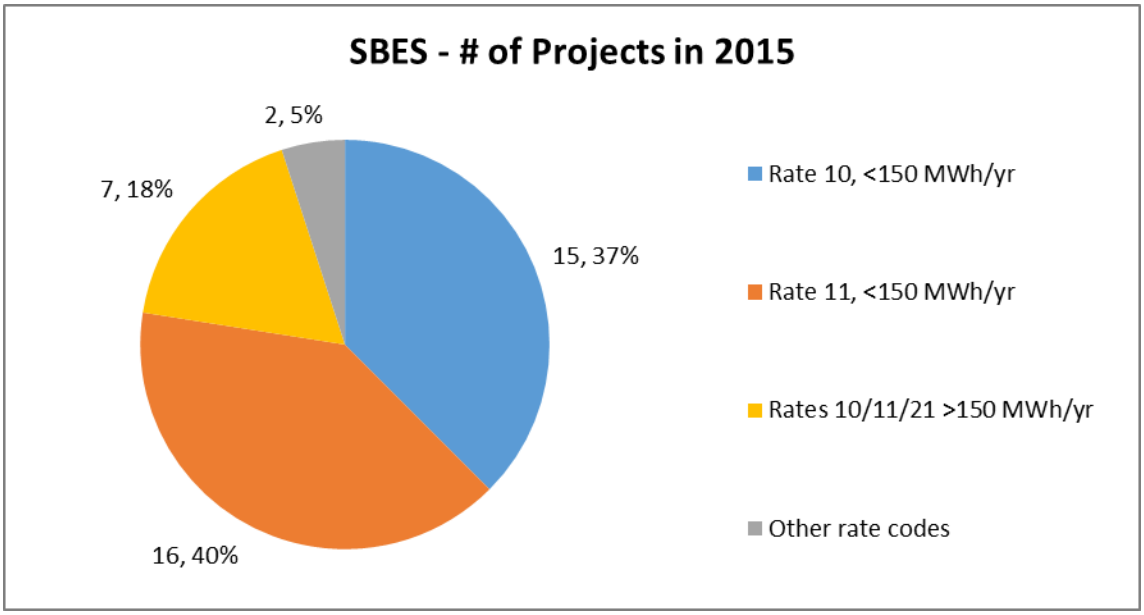
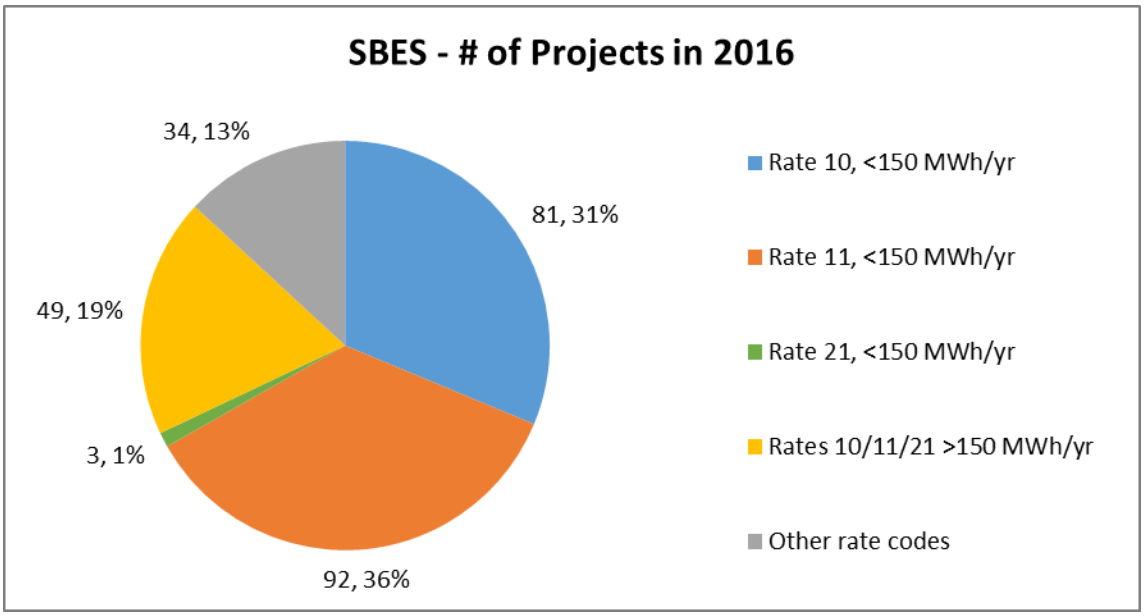


Figure 16: 2016 SBES Projects Completed



The low participation numbers relative to BES might be attributed to: i) SBES beginning mid-year 2015; ii) eligible participants requiring time to become familiar with the new delivery structure under SBES; and iii) a much smaller energy efficiency budget in 2015 and 2016 compared to 2014. Nonetheless, SBES participation numbers are increasing steadily, largely due to increasing awareness of the new delivery

structure and a concerted effort by SBES staff to overcome participation barriers including access to information.

Figure 17 demonstrates SBES participation by number of projects, businesses, and facilities, while Figures 18 through 20 provide increased granularity to display SBES participation numbers within the accounts represented by the SBA.

Figure 17: SBES Participation by Projects, Businesses, and Facilities

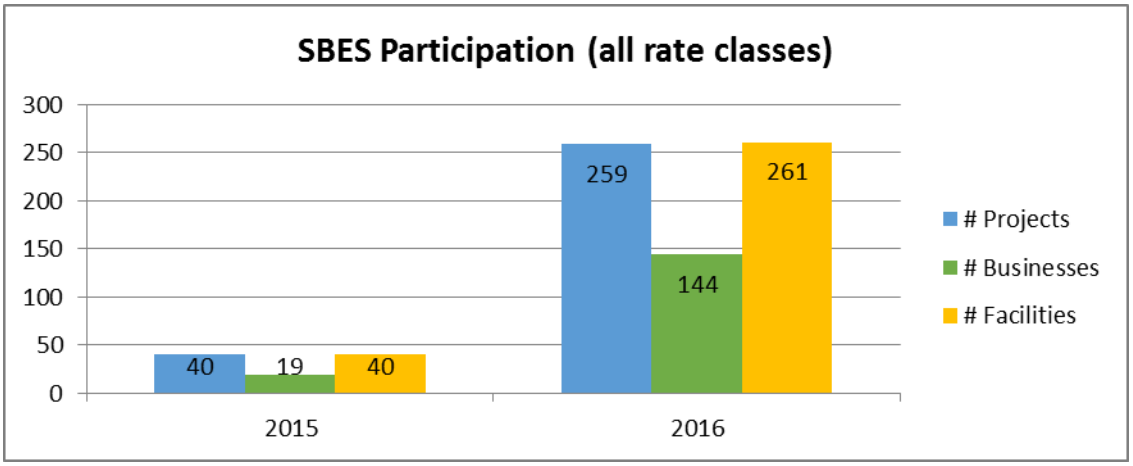


Figure 18: SBES Rate Class 10 Participation by Projects, Businesses, and Facilities

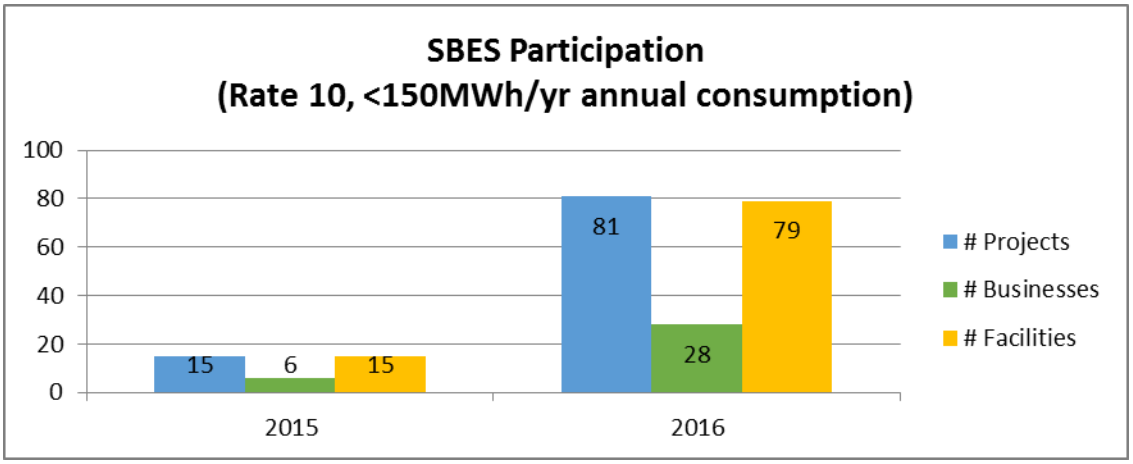


Figure 19: SBES Rate Class 11 Participation by Projects, Businesses, and Facilities

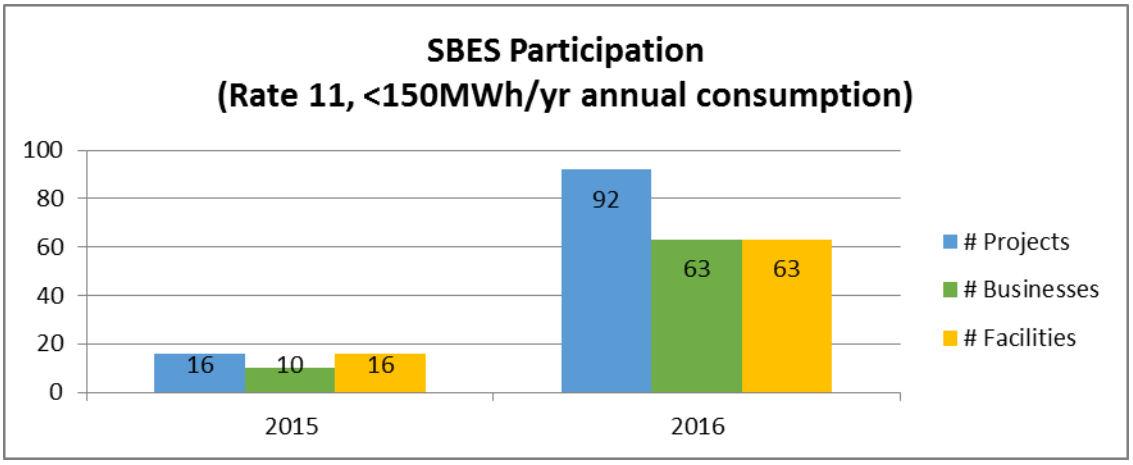
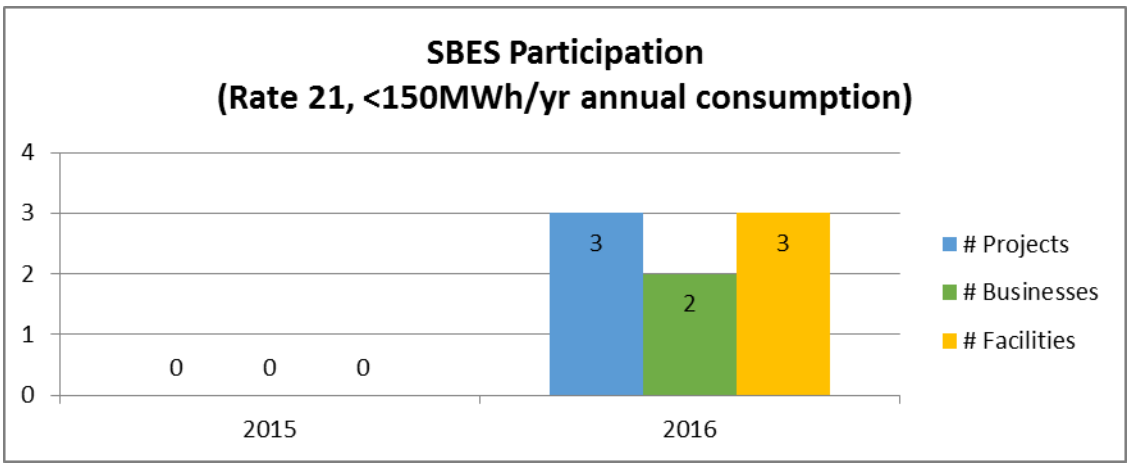


Figure 20: SBES Rate Class 21 Participation by Projects, Businesses, and Facilities



Figures 21 and 22 provide a high-level overview comparing the number of SBES projects completed between rate classes and year-over-year.

Figure 21: SBES Participation by Projects per Rate Class

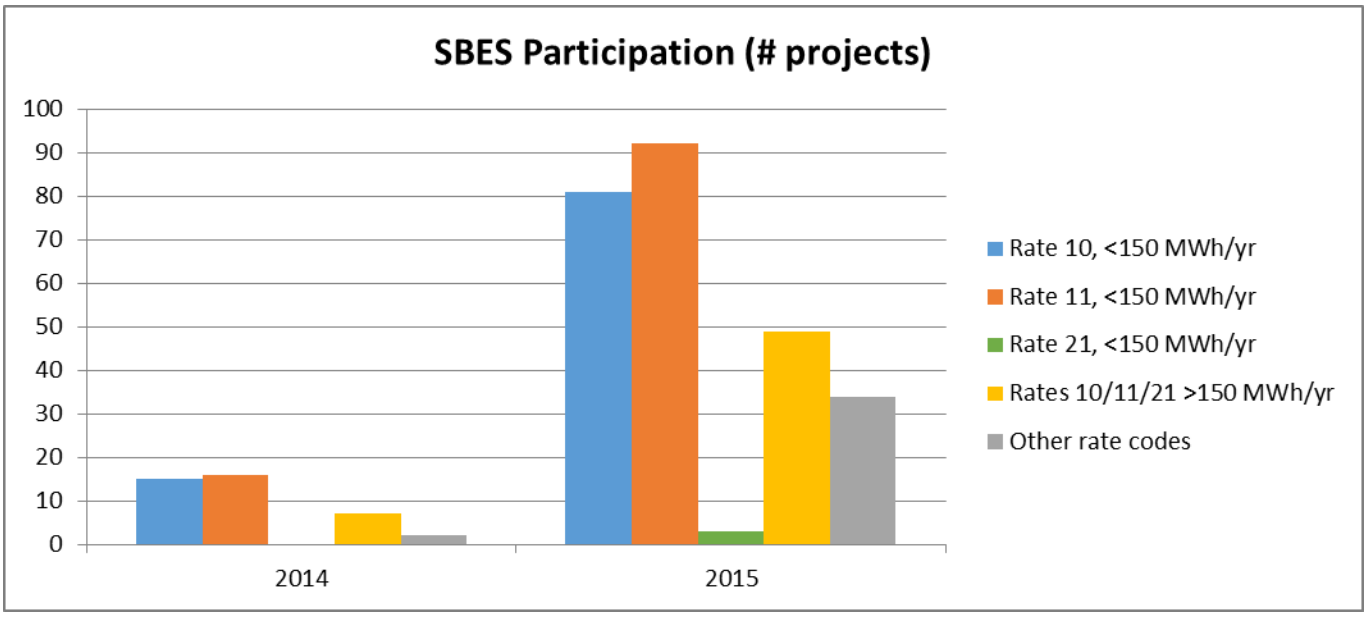
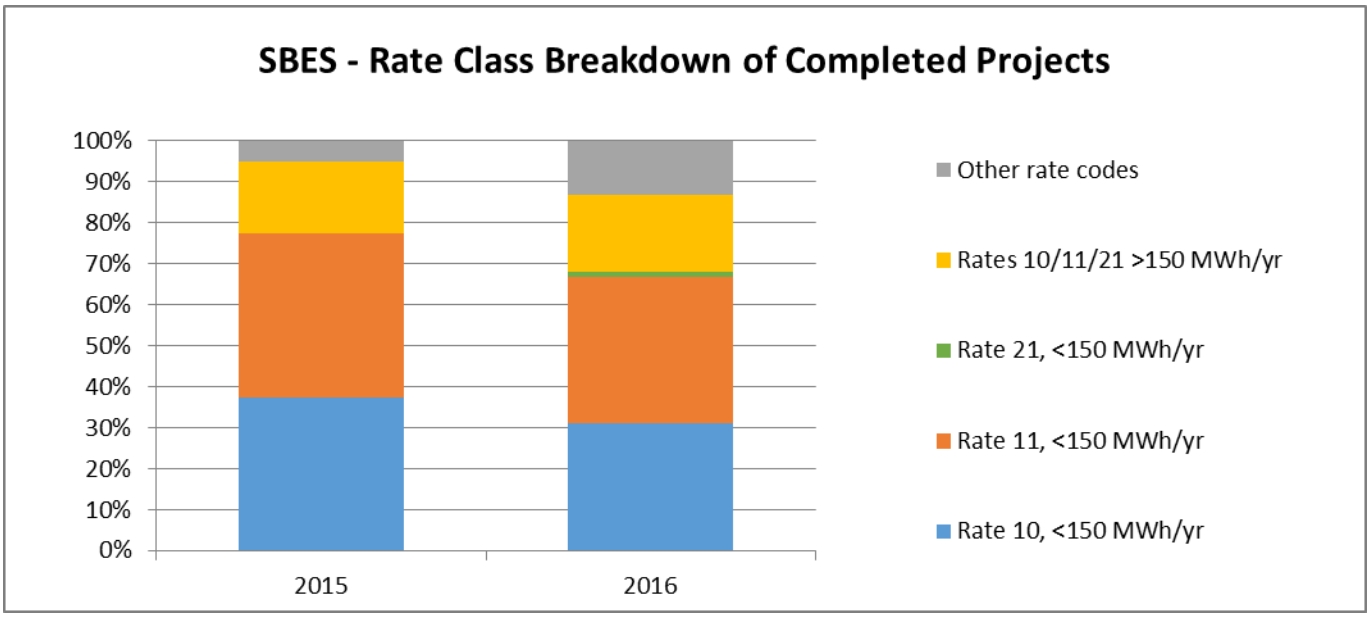


Figure 22: SBES Rate Class Breakdown of Completed Projects



3.2 EFFICIENT PRODUCT REBATES (BER)

BER is also administered by EfficiencyOne through its ENS franchise. BER provides financial incentives in the form of prescriptive rebates or financing to Business, Non-profit, and Institutional ("BNI") participants to encourage reducing electricity consumption and demand.[9] Participants have the option to choose rebates or financing.

Rebates offered through BER are delivered either through a Mail-in or Instant Rebates service. Participating Distributors discount Instant Rebates directly from invoices. This path is selected for high-volume measures where the savings are consistent and general assumptions such as runtime hours can be applied to all applications. When it is not possible to administer a rebate via Instant Rebates, usually because site- or participant-specific data must be collected, the rebate is administered via a Mail-in Rebate. This allows BER staff to verify details such as runtime hours and baseline technology. The Instant Rebates service is simpler for participants than the Mail-in service, thus resulting in higher participation rates.

BER was developed to incent Nova Scotian businesses, non-profit organizations, and other institutions to purchase energy-efficient technologies that they would not normally purchase, at a reduced financial impact. BER allows established and verified energy-efficient technologies to be deployed in rapid fashion, with minimum administrative burden to the purchaser.

BER goals include the following:

- encourage the use of efficient products in the design of new facilities and retrofits;
- increase the market penetration of the supported technologies; and
- transform the market by raising the efficiency of standard practices.

BER statistics indicate that just over half of BER Mail-in participants had previously participated in other ENS programs.[10] The following analysis reviews the BER program component parameters and qualifications, program component evolution, barriers to participation, and participation rates.

3.2.1 BER Parameters and Qualifications for Participation

Instant Rebates are available on energy-efficient lighting and pumping products at participating electrical distributors. Instant Rebates are automatically deducted from the invoice amount when a

[9] The term "prescriptive rebate" refers to a particular rebate value being calculated prior to a participant submitting a proposal. If a given product or technology shows potential energy savings, then the product or technology, along with its suggested rebate value, can be "prescribed" universally for any incoming participant.

[10] As ENS does not have any contact with, or participant information for Instant Rebates participants, corresponding information is not available for the Instant Rebates service.

participant purchases an eligible product from a participating distributor, provided that the purchase is being made for a business.[11]

Products that receive Instant Rebates are not eligible for Mail-in rebates. Rebated products are those that are typically found in commercial settings, and are sold through commercial vendors. This helps to ensure that only commercial participants are receiving Business Energy Rebates.

Approved distributors must submit a monthly rebate report outlining transactions, amounts, and rebate dates. BER staff verifies the reports and the distributors are then paid for the rebates offered for the calendar month. ENS performs monthly quality assurance checks on submitted distributor reports. If problems are encountered, a written warning is issued to the distributor and the template must be resubmitted until it is verified to be correct. If a distributor continues to have data consistency problems, they are promptly removed from the Instant Rebates service.

Instant Rebates has been designed as an open market service. BER has established "Participating Distributor Criteria" to determine which companies may qualify to become participating distributors. Any legitimate electrical distributor that meets these criteria is welcome to apply. All requests to become a participating distributor will be evaluated against the Participating Distributor Criteria at ENS's discretion.

The parameters and qualification requirements for the BER Mail-in service can be broken down into the following three steps.

Step 1: Prospective participants can review eligibility criteria and eligible projects and measures at efficiencyns.ca/BER to determine if their facility and project qualify for the BER Mail-in service.

Eligibility Criteria:

All BNI customers in Nova Scotia are eligible for BER. This includes customers whose accounts are billed under NS Power rate codes 04, 10, 11, 21, 22, 23, 24, 25 or a commercial Municipal Electric Utility rate code. Eligible facilities include the following:

- the project site must be a business, non-profit, or institutional facility served (directly or indirectly) by NS Power.
- multi-unit residential buildings (e.g., apartment buildings), either within common areas of the building (if apartment units are individually metered on residential accounts) or the entire facility (if all units are metered together under one or more commercial account(s));
- the facility is of an agricultural nature and is classed as a residential account; and
- new facilities in the design or construction phases.

[11] At the time of purchase, the distributor will ask if the product is being purchased for a business. Provided the purchaser confirms this, the instant rebate will be deducted from the invoice; if the purchaser indicates that the purchase is not being made for a business, no incentive will be applied. All rebates are delivered after tax and are subject to change without notice.

BER Mail-in statistics from 2014 through 2016 indicate that 20 to 30 percent of BER Mail-in projects are completed by small businesses that fall within the SBA's purview (NS Power rate classes 10, 11, and 21 with an annual electrical energy consumption of less than 150,000 kWh).[12]

Eligible Projects and Measures:

Eligible projects must meet the following requirements:

- projects must involve the purchase and installation of products eligible for rebates under BER;
- measures must be new and installed prior to claiming a Mail-in financial incentive;
- projects must save electrical energy; and
- energy and demand savings from the project cannot exceed the actual usage provided by NS Power (non-utility supply, such as cogeneration, self-generation or deliveries from another commodity supplier do not qualify as usage from NS Power), or the relevant fuel service provider.

Eligible measures are listed within the BER forms found online at efficiencyns.ca/BER and can be divided into the following 13 categories:

- Agriculture
- Lighting
- Refrigeration
- Laundry
- Kitchen
- Compressed Air
- Pool Equipment
- Heating
- IT & Datacenters
- Variable Frequency Drives
- Water Heating
- Solar Thermal
- Pumping

Eligible measures are established within each measure category by applying specific criteria. Required criteria include industry standards, such as products displaying the ENERGY STAR® Canada registered trademark, Design Lights Consortium, NEMA (National Electrical Manufacturers Association), and minimum efficiency/efficacy values.

Step 2: The prospective participant must complete the required application forms and submit them to ENS for approval within 90 days of installation. Pre-approval is only required for the following:[13]

- rebate amounts totaling more than $15,000;
- all water heating and solar thermal products;
- heat pump to heat pump conversions;
- some data centre technologies; and

[12] See Figures 25 through 27.

[13] Though not required, pre-approval is also encouraged for participants that may be concerned about their product eligibility. In this case, the BER team will review and pre-approve projects to ensure a participant's investment meets the eligibility requirements for an incentive through BER.

- 0 percent financing through NS Power (see "Financing", below).

As part of this application form, the prospective participant must also provide the following documentation:

- quote or proof of purchase;
- copy of a recent electric bill; and
- manufacturer product specification sheet(s).

The applicant can indicate on this form whether they would prefer to receive a rebate or 0 percent financing for the cost of their energy efficiency project (see "Financing", below). If the participant prefers a rebate over financing, the participant must indicate their preferred payment method (direct deposit or cheque). Rebates are paid after the equipment is purchased and installed, and incomplete applications may delay processing times. Application forms can be viewed online at efficiencyns.ca/BER.

The participant then emails this documentation to ber@efficiencyns.ca, mails it to the ENS office, or faxes it to 902-470-3599.

For pre-approved projects, the participant can purchase and install their energy-efficient upgrades once they receive approval to proceed from BER staff.[14] Pre-approval is typically provided within 5-10 business days.

Step 3: Once the installation is completed, ENS will review the completed application, invoices, and product specification sheets and issue the approved rebate. Rebates are either deposited directly into a participant's bank account or mailed as a cheque within 60 days of approval. ENS may request a site inspection prior to issuing payment.

ENS is required to have a third party evaluation performed annually to determine eligible savings. These reports are filed with the UARB and subsequently reviewed by an independent verifier who is hired by the UARB. The latest evaluation reports can be found on the UARB website.

Financing: In lieu of receiving a BER rebate, participants have the option of financing the full cost of their energy efficiency project (including materials, labour, and tax) from $2,500 to $500,000. Financing is offered through NS Power and is over a maximum of 24 months at 0 percent interest on approved credit.

If financing is selected, no rebates may be applied (Mail-in or Instant). If the measures are "instantly rebated", the participant is responsible for providing evidence, to the satisfaction of ENS, that no Instant Rebates were applied to any qualifying products procured by the participant. This includes providing all invoices to ENS.

To receive financing, the participant must apply for financing pre-approval before installation has occurred. In addition to the regular eligibility checks conducted by BER staff, NS Power will conduct a

[14] Products must be installed for the participant to obtain a rebate (e.g., the product cannot be purchased as a spare).

credit check to verify financing eligibility. It is possible for a participant to be eligible for rebates, but declined for financing.

If the participant is approved, and chooses to obtain financing, BER staff will ensure that all necessary information and documentation is ready, and issue a pre-approval. The participant may then proceed with installing their eligible equipment. Once complete, the participant must notify BER staff, who may conduct a site visit. A financing cheque will then be sent by NS Power to the participant (or the contractor if the participant chooses), and on-bill repayments will commence.

3.2.2 BER Evolution

BER has not undergone significant evolution since its inception. Since the core BER program component was developed, new measure categories have been added, as determined by market need and technological evolution. Through this ongoing and moderate evolution, BER continues to respond to the needs of the market by researching and launching new products, modifying incentive levels based on product prices, and monitoring codes and standards.

3.2.3 Barriers to Participation

As part of its evaluation process, ENS's external evaluator conducts participant interviews to gather feedback on, among other things, barriers to participating in BER. Typical barriers, as determined through evaluation reports and ongoing communication with BER participants, are highlighted in Table 3, below, alongside the associated mitigation strategies.

Table 3: BER Participation Barriers and Mitigation Strategies

Barrier	Mitigation Strategy	Result of Mitigation Strategy
Financial: Potential participants may lack the capital resources to pursue energy efficiency projects.	BER offers rebates or financing to help participants overcome capital resource barriers.	Although some BER Mail-in participants have indicated that i) rebate amounts could be higher, ii) more product rebates could be offered, and iii) the time required to receive rebates could be shortened, participant feedback on financial support is generally positive.
Lack of Information: Participants may not understand the costs, benefits, and appropriateness of various energy efficiency projects for their business. For various reasons, potential participants may have a difficult time understanding the value of replacing or selecting energy-efficient alternatives.	BER staff serve as ambassadors to promote energy efficiency. ENS has developed marketing materials and educational activities targeting distributors (vendors), contractors, and consultants to increase awareness of energy efficiency and BER. Educational and promotional materials are also directed at potential participants. BER marketing and communications strategies emphasize that BER is easy to access and the many benefits that it offers.	By continuing to highlight the benefits and costs of energy efficiency projects, potential participants understand the benefits and continue to implement energy-efficient projects in their businesses.

Administrative Burden for Participating Distributors (Instant Rebates): Although most distributors recognize the need for proper tracking and reporting, some have provided feedback indicating that they do not have adequate resources for these tasks.	BER works with the distributors to try and minimize the data required for reporting and evaluation, ensuring that only necessary data is captured. BER also works with distributors to streamline the process and provide training and assistance when necessary. This is a process of continuous feedback and improvement. In 2017, BER will adopt a new data system that will work to make the tracking and reporting process easier for distributors.	The adoption of a new data system will work to address the resource issues and challenges that distributors face.
Mail-in Rebates Application Process: Feedback has indicated that more user-friendly forms would simplify the application process for participants.	ENS made a concerted effort to simplify the BER application process, forms, and paperwork in 2016. ENS removed all information that was deemed non-essential to determining project incentives from the forms for each measure category.	Participants have provided positive feedback on the simplified process.

3.2.4 Participation Rates

This section provides a compilation of figures and tables that review BER Mail-in participation numbers from 2014-2016. Participant information is not available for the Instant Rebates service, precluding ENS from providing the same information for this service.

Figure 23 provides contextual information on the number of facilities within the SBA's purview (based on rate class and electrical energy consumption) that are eligible for the BER Mail-in service.[15] Figure 23 shows that small businesses within the SBA's purview comprise 84 percent of eligible BER Mail-in participants. Figures 24 demonstrates the proportion of the eligible accounts within the SBA's purview that participated in the BER Mail-in service from 2014 through 2016.

[15] When read together with Table 2 (SBA Representation of Rate Classes 10, 11, and 21), Figure 23 shows that all facilities within the SBA's purview are eligible for the BER Mail-In service.

Figure 23: BER Mail-in - Number of Eligible Accounts

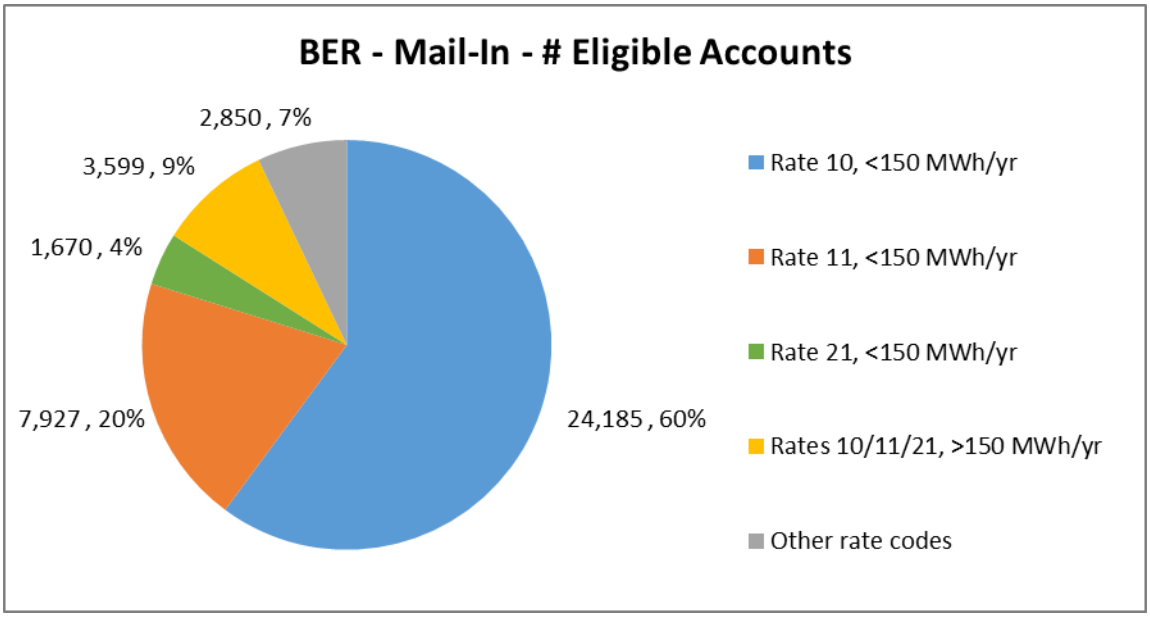
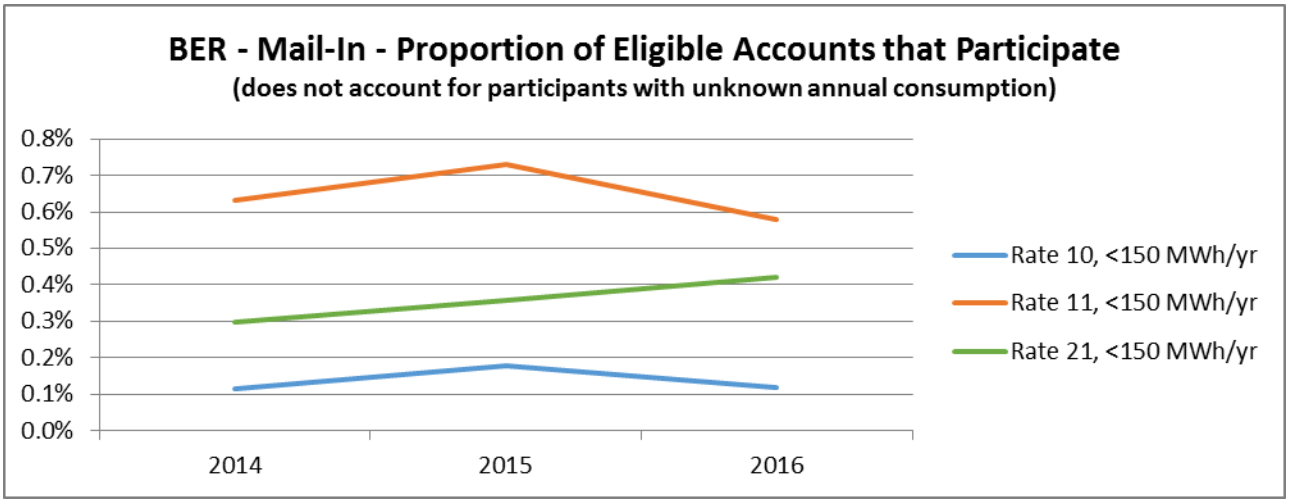


Figure 24: BER Mail-in 2014-2016 Participation Rates for SBA Accounts



Figures 25 through 27 show the number of projects completed by rate class for the years 2014 through 2016. These figures show that facilities within the SBA's purview have completed a very consistent proportion of Mail-in projects over the years 2015 and 2016 (30 percent in 2015 and 29 percent in 2016). ENS collected fewer NS Power account numbers in 2014, resulting in a larger portion of projects for which annual consumption is unknown.

Figures 25 through 27 also demonstrate that, although small businesses make up the vast majority of eligible BER Mail-in participants, in practice, they comprise a much smaller number of participants. This

might be because: i) lighting presents a significant opportunity for small businesses and, as the majority of lighting rebates are available through BER's Instant Rebates service, small businesses might be proceeding through the Instant Rebates service rather than the Mail-in service; and ii) small businesses may opt to participate in SBES rather than BER.

Figure 25: 2014 BER Mail-in Projects Completed

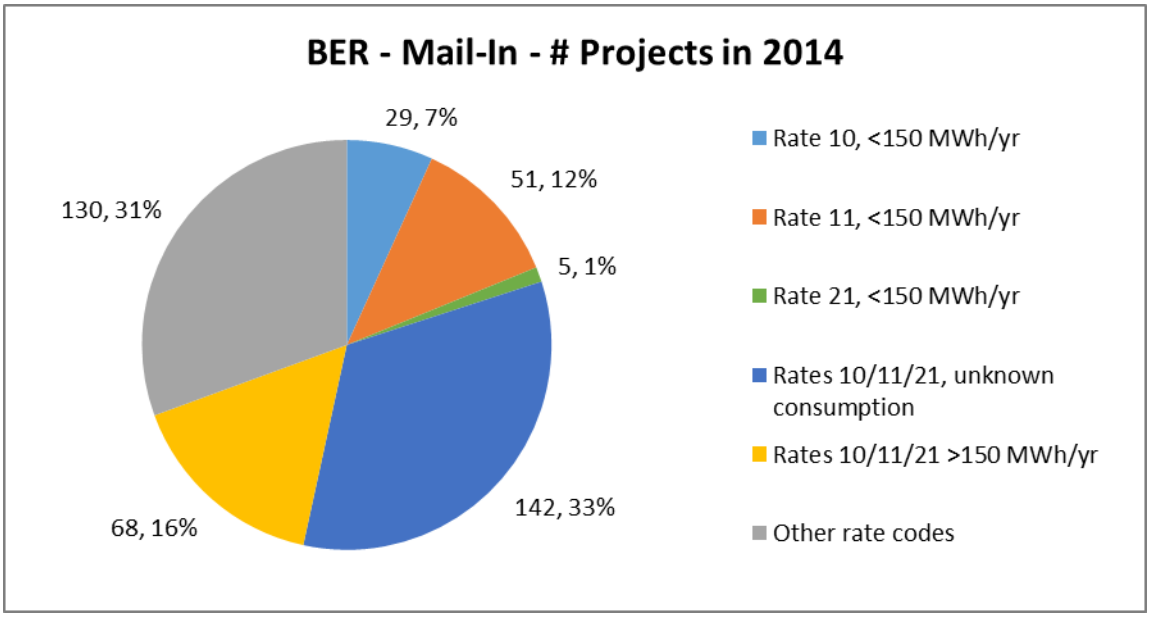


Figure 26: 2015 BER Mail-in Projects Completed

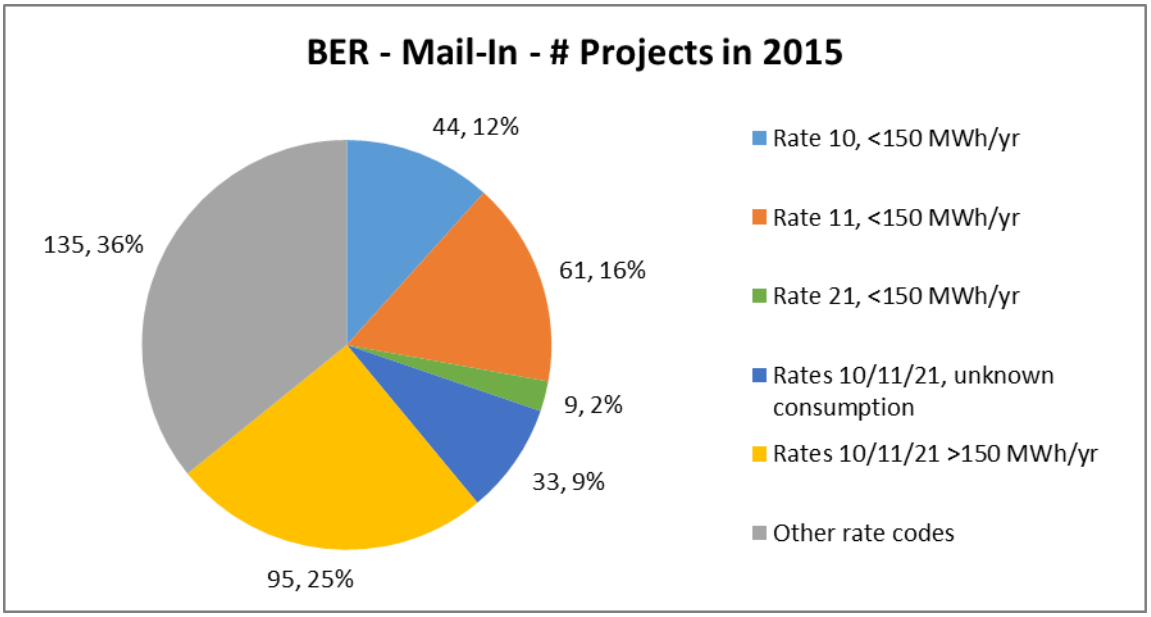


Figure 27: 2016 BER Mail-in Projects Completed

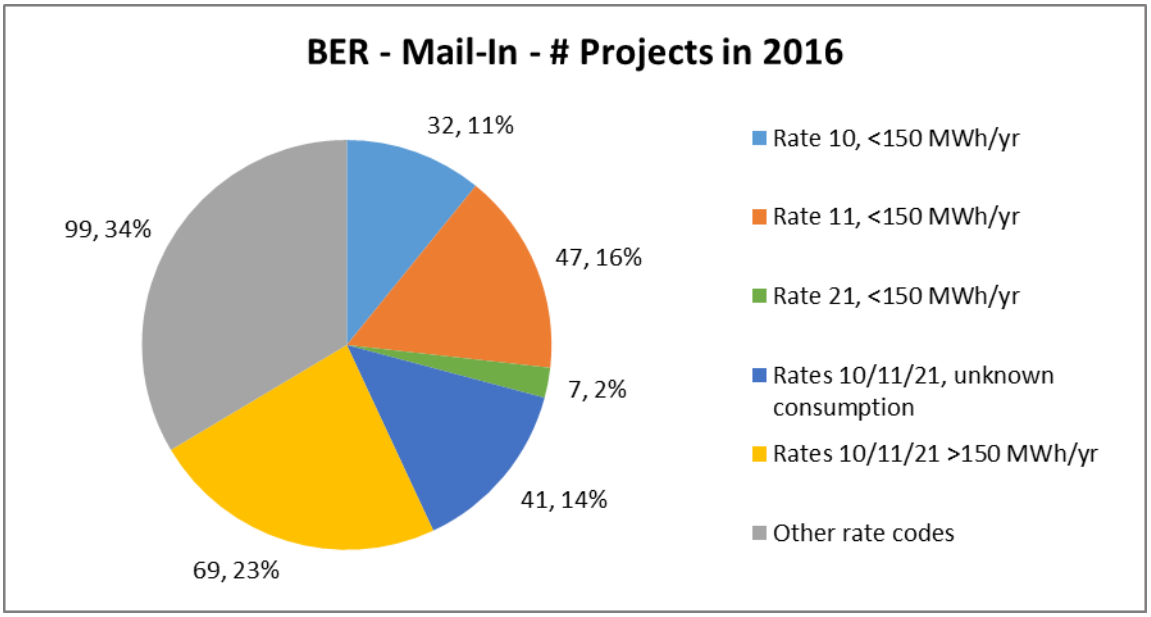


Figure 28 demonstrates BER Mail-in participation rates by number of projects, businesses, and facilities, while Figures 29 through 32 provide increased granularity to display participation numbers for accounts represented by the SBA.

Figure 28: BER Mail-in Participation by Projects, Businesses, and Facilities

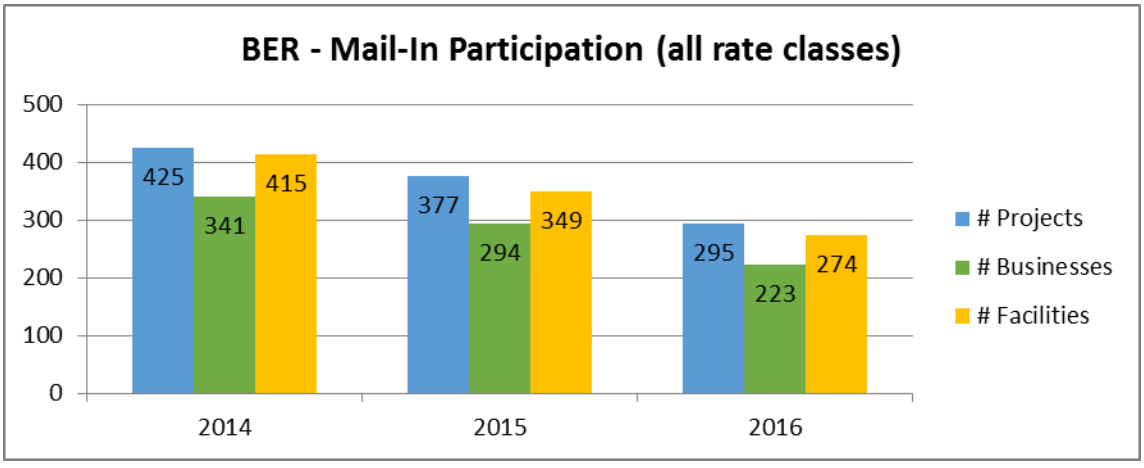


Figure 29: BER Mail-in Rate Class 10 Participation by Projects, Businesses, and Facilities

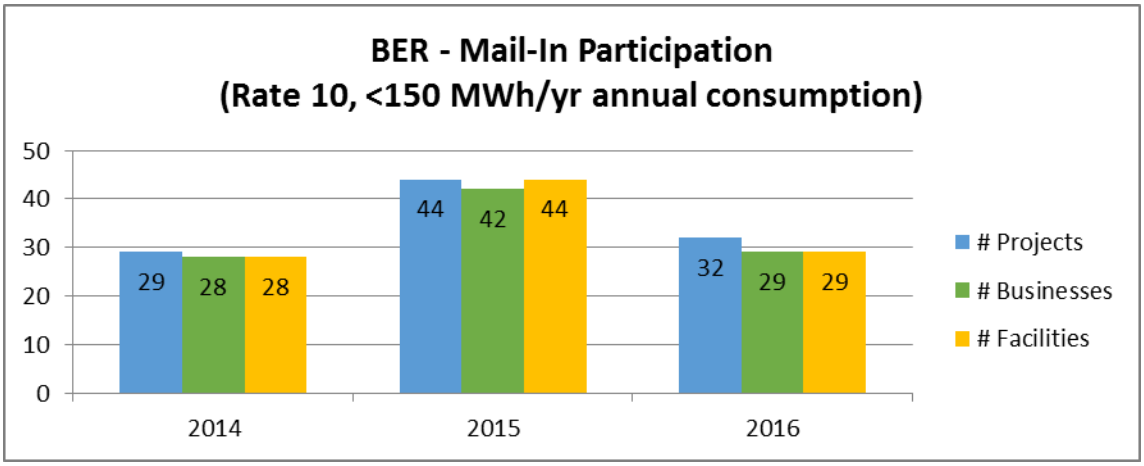


Figure 30: BER Mail-in Rate Class 11 Participation by Projects, Businesses, and Facilities

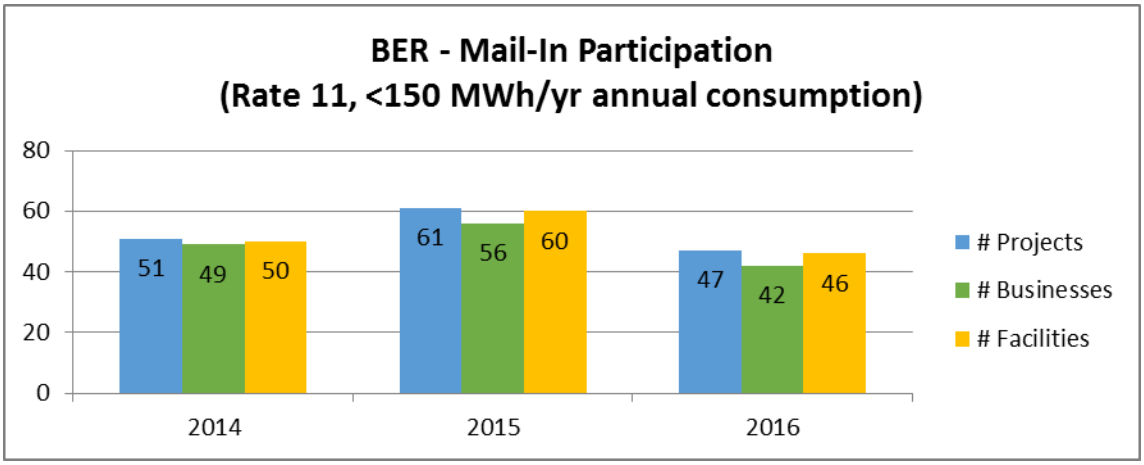


Figure 31: BER Mail-in Rate Class 21 Participation by Projects, Businesses, and Facilities

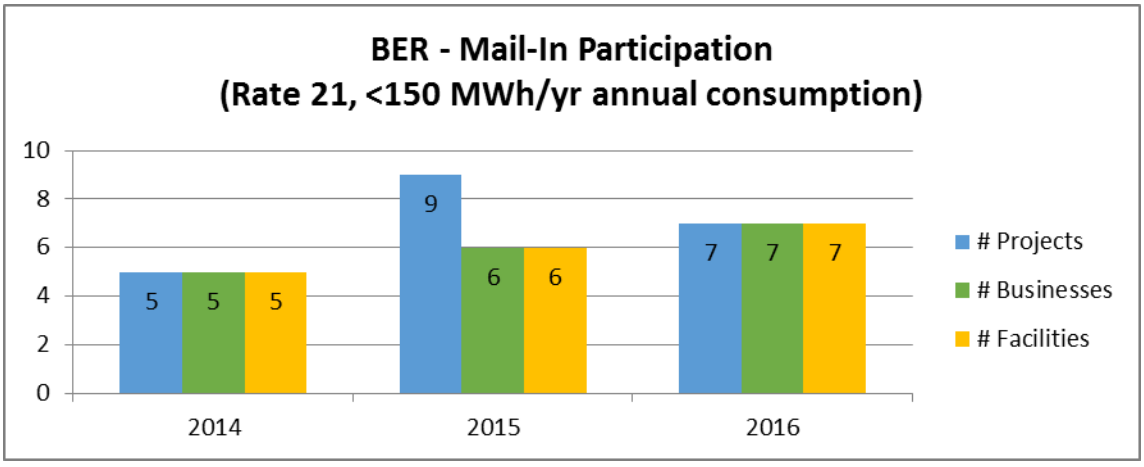
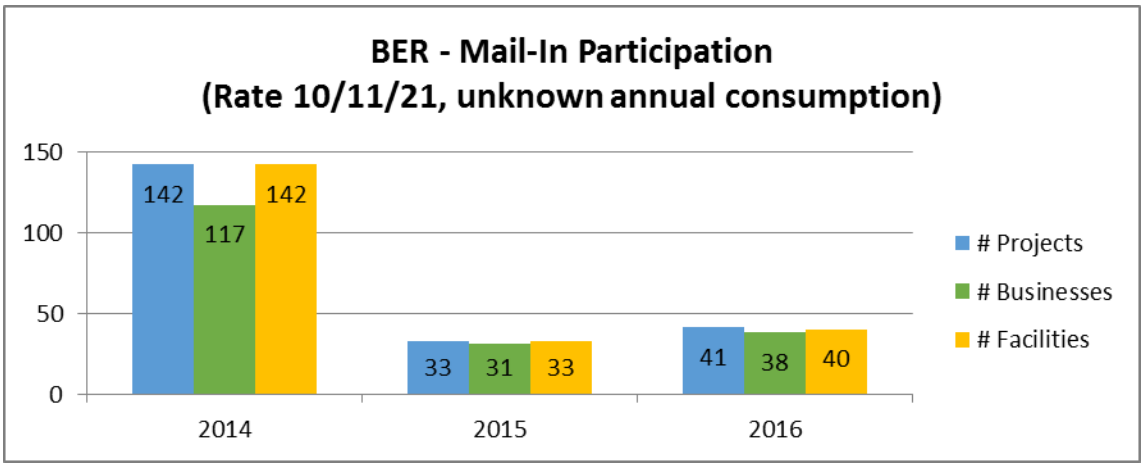


Figure 32: BER Mail-in Rate Classes 10, 11, and 21 Participation - Unknown Annual Consumption



Figures 33 and 34 provide a high-level overview comparing the number of BER Mail-in projects completed between rate classes and year-over-year.

Figure 33: BER Mail-in Participation by Projects per Rate Class

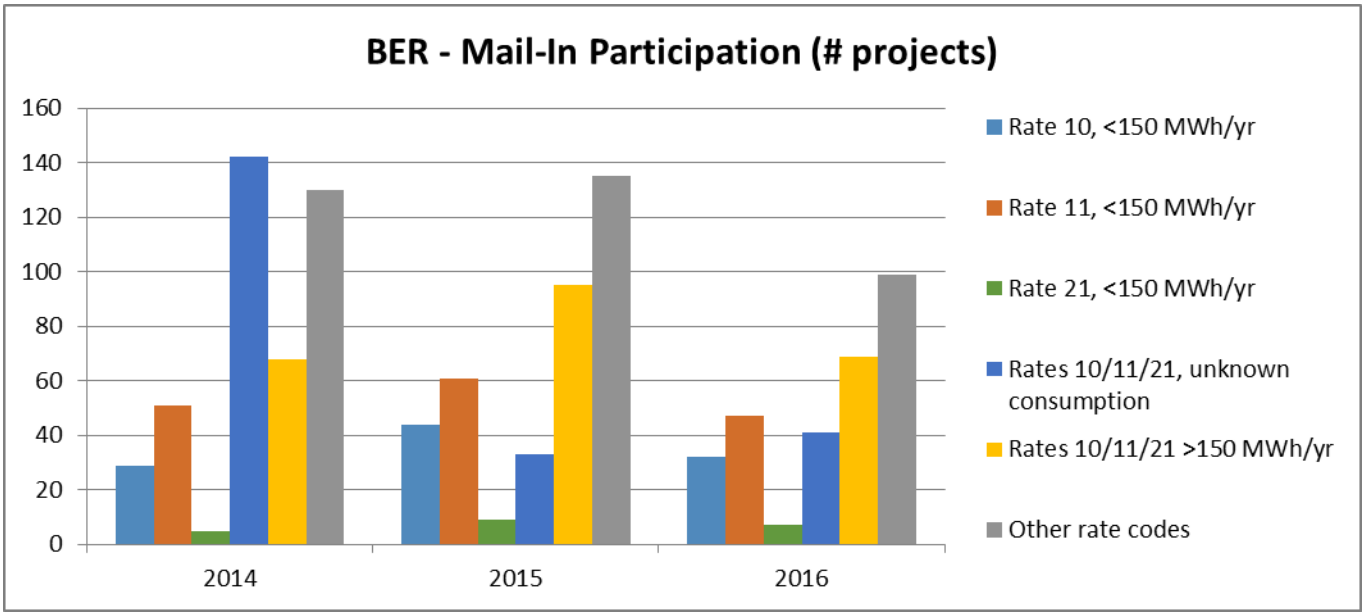
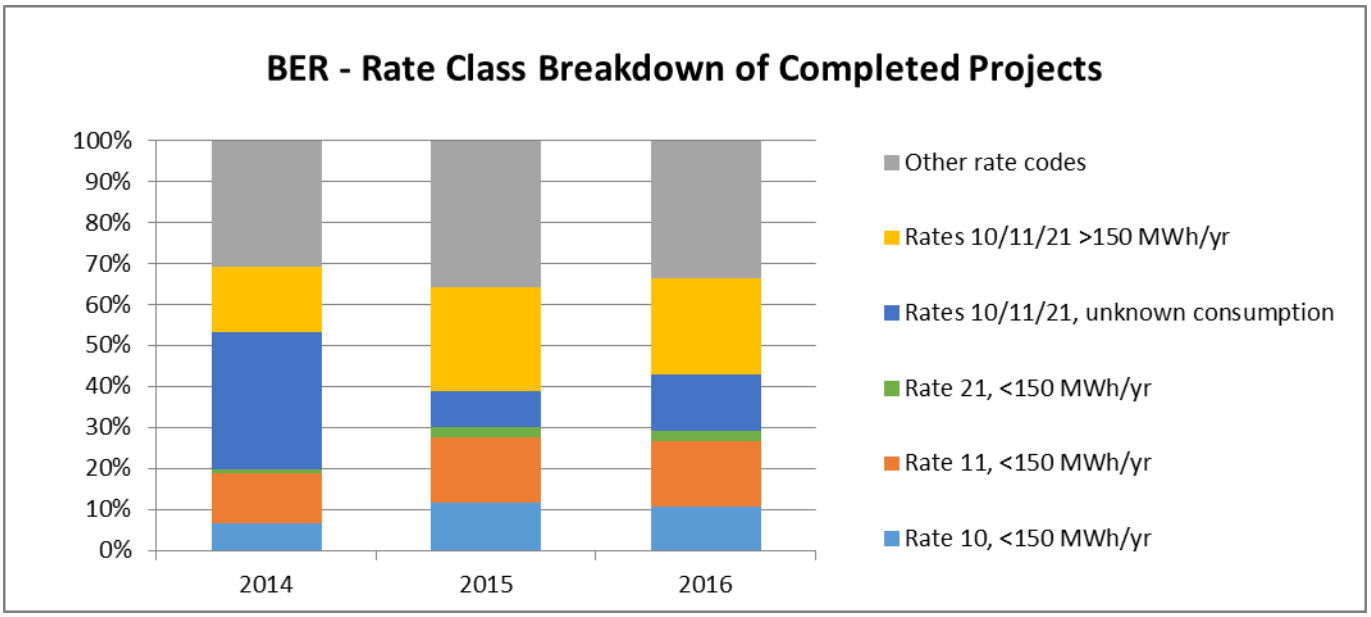


Figure 34: BER Mail-in Rate Class Breakdown of Completed Projects



3.3 OUTREACH

To increase awareness of, and participation in, SBES and BER, ENS engages in a broad range of outreach activities detailed below.

3.3.1 How Participants Know About SBES and BER

Small businesses are reached through a variety of mechanisms, including tailored marketing and outreach activities, as well as through Business Development Managers (BDMs) and independent energy auditors.

Typical outreach and marketing activities include the following:

- Trade Allies: The ETN consists of, among others, contractors and small businesses in Nova Scotia and provides a vehicle through which ENS can share information on promotions and offerings throughout the year. In the case of ETN members who are contractors, this channel provides an opportunity to deliver current information on small business offerings, enabling them to share this information with their small business clients. ENS uses the ETN to, among other things, distribute a bi-monthly e-newsletter ("Network News"), which was launched in December 2016. Network News was designed specifically for ETN members to highlight updates on programs, pilots, procurement opportunities, helpful tips, industry trends, training, events, and more.
- Affinity Groups: ENS is actively involved with many business-related associations, including:
    - Building Owners & Managers Association (BOMA) Nova Scotia;
    - Business district member groups;
    - Canadian Condominium Institute (CCI) – Nova Scotia Chapter;
    - Canadian Federation of Independent Business (CFIB);
    - Chambers of Commerce;
    - Construction Association of Nova Scotia (CANS);
    - Halifax Partnership – Small Business Action Team;
    - Investment Property Owners Association of Nova Scotia (IPOANS);
    - Nova Scotia Association of REALTORS® (NSAR);
    - Restaurant Association of Nova Scotia (RANS);
    - Small Business Network (Access the Best); and
    - Tourism Industry of Nova Scotia (TIANS).

  ENS leverages these connections to promote its small business offerings through association publications, websites, and newsletters as well as by participating in, and speaking at, events and annual conferences. For example, in 2016, ENS developed three versions of print-ready articles on SBES, which were distributed to RANS, NSAR, Chambers of Commerce, CFIB, the Small Business Network (Access the Best), CCI – Nova Scotia Chapter and business district member groups (e.g., the Sackville Business Association). Some of these recipients, including some of the Chambers of Commerce, NSAR, and the CCI – Nova Scotia Chapter, published these materials in

their newsletters and/or shared them on social media. ENS has also met with various groups, including TIANS, the Halifax Partnership's Small Business Action Team, and the Small Business Network (Access the Best) to explore how ENS and these organizations can work together to meet small business needs. These discussions have led to small business referrals and further networking opportunities.

- MLA Bulletins: ENS distributes "Efficiency Connection", a quarterly, region-specific bulletin for Nova Scotia's MLAs, providing updates on initiatives and activities, including small business offerings.
- Direct Mail: ENS sends province-wide mail-outs to all Nova Scotia businesses on average twice per year.
- Direct Email: ENS raises awareness of its small business offering through direct emails to current and past participants, personalized to present service offerings that are relevant to their business.
- Print: ENS uses the Nova Scotia Business Journal, Business Voice Magazine, and Local Connections Halifax magazine to raise awareness of its small business offerings.
- Press releases: ENS often distributes press releases to raise awareness of new small business offerings and/or initiatives of interest.[16]
- Digital: ENS uses its website as an educational tool to raise awareness of its small business offerings as well as search engine marketing and optimization (e.g., Google Adwords). ENS distributes a BNI e-newsletter to a list of approximately 4,900 recipients on average six times per year. Digital advertisements on AllNovaScotia.ca, CBC.ca, and the Herald.ca comprise another part of ENS's outreach and marketing efforts to raise awareness of its small business offerings. ENS also advertises on Gmail and Kijiji, in addition to digital advertising with geo fencing and programmatic digital media buys.
- Events: ENS experts attend events as appropriate to engage with small businesses and raise awareness about SBES and BER.
- Social media: ENS is active on social media platforms, including Facebook, Twitter, and LinkedIn and uses these platforms to raise awareness of its small business offerings.
- Point of Purchase (POP): POP promotions and engagements are critical for BER Instant Rebates campaigns, which take place every fall and spring. The in-store marketing tools used to make potential participants aware of the campaigns may include decals, posters, and contests.

Small businesses are also reached through ENS's BDMs and independent energy auditors. BDMs are responsible for, among other things, identifying and reaching out to businesses to share information on ENS's offerings and to drive participation.

In 2017, most of the BDMs' contact with small businesses will occur through the BDM responsible for the Hospitality, Tourism, and Retailer verticals; this BDM will spend roughly 20 percent of their time

[16] For example, in 2015, ENS issued press release about a Nova Scotia-based car dealership that won a Bright Business Award for their efforts in reducing energy and in 2016, ENS announced the launch of the Affordable Multi-family Pilot, a new SBES offering for property owners and landlords.

engaging with small businesses, with the goal to have them complete their online Business Profile to determine which ENS services would benefit them.

BDMs work with businesses in all areas of the province, with an enhanced focus on rural and economically stressed areas as these businesses stand to derive significant benefits from energy efficiency that enable them to be more competitive. Small businesses have provided positive feedback on this proactive in-person contact as they often lack the time and resources to seek out advice on how to lower their electricity bills.

The first point of contact for small businesses might also be through independent energy advisors, who promote the SBES service to solicit business for the audit component of SBES. Small businesses might also learn about relevant ENS offerings through the SBES direct installation service (e.g., light bulbs, pipe insulation, and faucet aerators); since small businesses must complete a Business Profile to benefit from the direct installation service, this would not be their first contact with ENS, though they may benefit by learning about other opportunities through conversations with the installer during the visit.

These three main touch-points for small businesses (marketing and outreach activities, BDMs, and energy advisors) all seek to encourage small businesses to complete their online Business Profile. If small businesses have questions related to this process or require further information, they are directed to ENS's small business Energy Service Advisor (ESA). This ESA works directly with the small business to efficiently resolve any remaining questions they may have and to help potential participants overcome some of the resource barriers they face (e.g., lack of information and time). In 2016, ENS's small business ESA received almost 1,300 calls related to SBES and/or BER.

3.3.2 Contacts to the promotional channels

ENS estimates the following contacts through the promotional channels for small businesses in NS:[17]

Table 4: Contacts to the Promotional Channels

Promotional Channel	Frequency	Geographical considerations
Trade Allies	The Network News is distributed **six times per year.**[18]	Distributed province-wide to all ETN members.

[17] The following numbers are based on ENS's definition of small businesses (threshold electrical energy consumption of less than 350,000 kWh/year), unless otherwise noted. Although these contacts relate to small businesses, they are not necessarily sent to small businesses (e.g., they may be sent to MLAs, Chambers of Commerce, trade allies and other contacts to raise broad awareness of ENS's small business offerings).

[18] It is unknown how many ETN members are small businesses, though many of the contractor members will work with small businesses.

Affinity Groups	ENS attended close to **20 affinity group events** related to business segments in 2016.[19]	Province-wide.
MLA Bulletin	Distributed **quarterly.**	Province-wide, with region-specific information.
Direct Mail	Approximately **twice per year**.	Distributed to all businesses in Nova Scotia, regardless of location.
Direct Email	Approximately **one direct email per year**.	Distributed to current and/or past small business participants (almost 2,000 email recipients), regardless of location.
Print	ENS placed approximately **four small business print advertisements** in 2016.[20]	Province-wide.[21]
Press releases	As required and as appropriate.	Press releases are typically issued province-wide.

[19] This number varies by year and is not limited to small business events (e.g., it could also include larger businesses). In addition to these events, ENS also uses other forms of outreach through these groups to communicate with small businesses. For example, in 2016, ENS developed three versions of print-ready articles on SBES which were distributed to certain affinity group members.

[20] This number varies by year, depending on market needs and offerings.

[21] ENS places print advertisements with: Metro Halifax, Imagine Feature (average circulation 48,340; estimated readership 157,000; coverage: HRM); Business Voice (average circulation 4,000; estimated readership 16,000; coverage: HRM); Chronicle Herald, Small Business Feature (average circulation 82,366; estimated readership 177,000; coverage: Provincial); Municipal Voice (average circulation 1,500; estimated readership 4,000; coverage: NS Municipalities); Eastern Hotelier (average circulation 5,284; estimated readership N/A; coverage: National Canadian Coverage); and Spaces: BOMA (average circulation 10,000; estimated readership 25,000; coverage: HRM).

Digital	ENS distributes approximately **six BNI e-newsletters per year**. In 2016, digital impressions for SBES and BER ads totalled **4,890,028**.	E-newsletters are distributed through a BNI subscription list of roughly 4,900 recipients, regardless of location.[22]
Events	In 2016, ENS's Community Outreach Coordinator attended approximately **50 events**; an estimated 50 percent of the time is spent responding to small businesses enquiries.[23]	These events are province-wide and ENS makes a concerted effort to reach all regions of the Province.
Social media	Small business posts comprise approximately **20-25 percent of ENS's organic social media posts**. There are certain times of the year when social media posts are more common, including national small business week (October).	N/A.
Point of Purchase	BER has **two in-store campaigns per year** (spring and fall) for its Instant Rebates service.	These campaigns take place province-wide at 14 distributors through 47 branches across the province.[24]

[22] While the e-newsletter is sent to approximately 4,900 recipients, ENS does not have any means of determining business size or type.

[23] This number may fluctuate depending on the year and the number of relevant events taking place. This does not account for unique special events that staff are invited to speak at or attend that may be program-specific. This number excludes homeshows, as the Community Outreach Coordinator does not receive many questions on small businesses at these events. ENS does not formally categorize businesses as 'small businesses' at these events; as such, the estimate of time spent engaging with small businesses is approximated.

[24] These distributors are located in: Amherst; Bridgewater; Coldbrook; Dartmouth; Halifax; Kentville; New Glasgow; Sydney; Truro; and Yarmouth.

ATTACHMENT A

ENS RESPONSE TO CRA SMALL BUSINESS ENERGY RESEARCH RECOMMENDATIONS

ENS has reviewed the recommendations provided by CRA in its report, titled *Small Business Energy Efficiency Research*, and offers the following comments.

Recommendation Text:

1. *Efficiency Nova Scotia should take steps to build greater awareness of Small Business Energy Solutions and Business Energy Rebates.*

   Despite the fact that ENS has been in existence only a few years, the research indicates there already is an admirable level of program participation by companies in the targeted small business rate codes. Nonetheless, there remains an opportunity for ENS to build greater awareness of Small Business Energy Solutions and Business Energy Rebates, with the attendant goal to augment program participation among small businesses to still higher levels. This opportunity is particularly evident given that there already exists widespread and favourable awareness and opinion regarding ENS, together with a clear desire on the part of NS companies to enhance the energy efficiency of their business locations. The key 'missing link' is heightened corporate awareness of relevant ENS business programs. ENS's media strategy should be considered in light of the current research indicating that many Participant and Non-Participant organizations first learned of ENS business programs through word of mouth rather than sources such as media advertising, the Internet, and social media. This recommendation is also formed on the basis of many Non-Participant organizations citing a lack of awareness and information as the main reasons for not participating in ENS programs, while only a minority of such organizations report heightened familiarity with the programs offered.

ENS Comments:

ENS agrees with this recommendation and will continue to work towards increasing small businesses' awareness of ENS's programs. ENS's currently profiles small business participants for success stories that are included in outreach materials, recognizing that sharing these experiences is a valuable way to raise awareness of energy efficiency. ENS will continue to work with champions who engage with small businesses to help provide accurate information on Small Business Energy Solutions and Business Energy Rebates.

Recommendation Text:

2. *Efficiency Nova Scotia should utilize the study results to highlight program participation benefits for potential participants.*

   As an extension of the above recommendation specifically focused upon increased program awareness, there also exists an opportunity to utilize the study results to highlight program participation benefits for potential participants. The survey results gleaned from Participant organizations indicate that a majority of these companies observed a reduction in their energy use and electricity bills. These findings identify concrete and pivotal benefits of program participation, and point toward a powerful message to entice other organizations to consider participation.

ENS Comments:

ENS agrees with this recommendation and will use the information provided through this survey to inform its outreach efforts, where appropriate.

Recommendation Text:

3. *ENS should recommend that program Participant companies reference their energy efficiency practices in future communications and marketing materials.*

   The survey results suggest an opportunity for ENS to recommend to program Participant organizations that they promote their energy efficiency practices in their communications and marketing efforts. As it stands, the majority of Participants rarely or never promote energy efficiency, thereby identifying an opportunity for ENS to embed a standardized program exit pitch to its clients to include energy efficiency as a focus in future communications and marketing efforts. Increased promotion of energy efficiency may allow Participant organizations to differentiate themselves from their competition, while also acting as a promotional tool for ENS business programs.

ENS Comments:

ENS will consider opportunities to encourage small business participants to reference their energy efficiency practices in their communications and marketing materials, where appropriate.

NON-CONFIDENTIAL

Request IR-17:

Please provide operating plan of SBES program of 2018. If the operating plan is not available, please provide any guidelines, memos, email that is guiding the operation of 2018 DSM Plan.

Response IR-17:

Please refer to Attachment 1 of this IR response for ENS's 2017 Annual Progress Report (see Section 3, 2019 Planned Activities).

As part of ENS's Q1 Report, the 2018 mid-course adjustments were filed with the Utility and Review Board on May 25, 2018.

Additional information can be found in the following locations:

- the 2016-2018 DSM Resource Plan, with regards to the Direct Installation program (marketed as Small Business Energy Solutions);
- the 2017 Direct Installation Evaluation Report, which contains recommendations for program improvement that EfficiencyOne will considered for implementation in 2018; and
- the 2017 Savings Verification Study.

Please refer to EfficiencyOne's response to NSUARB IR-20 and NSUARB IR-21 for EfficiencyOne's reply to Evaluation and Verification recommendations.

EFFICIENCY NOVA SCOTIA

IN THE MATTER OF The Public Utilities Act, RSNS 1989, c 380, as amended,

- and –

IN THE MATTER OF Efficiency Nova Scotia's 2017 Annual Progress Report.

ENS 2017 DSM Annual Progress Report

Date Filed:
March 29, 2018

Table of Contents

1 2017 DSM RESULTS 1
1.1 2017 DSM Programs 5
1.2 Residential Sector Results 11
1.2.1 Efficient Product Rebates 11
1.2.2 Existing Residential 14
1.2.3 New Residential 19
1.3 Business, Non-Profit and Institutional Sector Results 21
1.3.1 Efficient Product Rebates 22
1.3.2 Custom Incentives 24
1.3.3 Direct Installation 28
1.4 Low Income Highlights 30
1.5 Enabling Strategies 33
1.5.1 Education and Outreach 33
1.5.2 Development and Research 36
1.5.3 Other Enabling Strategies 38
2 HST UPDATE 45
3 2018 PLANNED ACTIVITIES 46
3.1 Residential Programs and Services 47
3.1.1 Efficient Product Rebates 47
3.1.2 Existing Residential 48
3.1.3 New Residential 50
3.2 Business, Non-Profit and Institutional Programs and Services 51
3.2.1 Efficient Product Rebates 52
3.2.2 Custom Incentives 52
3.2.3 Direct Installation 54
3.3 Enabling Strategies 55
3.3.1 Education and Outreach 55
3.3.2 Development and Research 56
3.3.3 Other Enabling Strategies 56
4 PLANNED AND ACTUAL DSM EXPENDITURES 60
5 UPDATES ON ITEMS ARISING FROM THE 2016-2018 REGULATORY PROCESS 63

5.1 Locational DSM Efforts 63
5.2 Historical Rate and Bill Impact Analysis 64
5.3 Cost-Effectiveness Testing 64
5.4 Incentive Setting Methodology Study and Implementation 65
5.5 Update on Evaluation and Verification Recommendations 67
6 CONCLUSION 68

LIST OF TABLES

Table 1: 2017 Planned Savings, Mid-Course Adjustments, and Results 2
Table 2: 2017 Participation Rates 3
Table 3: 2017 Unit Cost 4
Table 4: EPR Rate Class Results (Residential) 12
Table 5: Existing Residential Rate Class Results 15
Table 6: New Residential Rate Class Results 20
Table 7: EPR Rate Class Results (BNI) 23
Table 8: Custom Incentives Rate Class Results 25
Table 9: Direct Installation Rate Class Results 29
Table 10: Low Income Results 32
Table 11: 2015 Planned and Actual DSM Expenditures by Rate Class 60
Table 12: 2016 Planned and Actual DSM Expenditures by Rate Class 61
Table 13: 2017 Planned and Actual DSM Expenditures by Rate Class 61
Table 14: 2018 Planned DSM Expenditures by Rate Class 62

LIST OF FIGURES

Figure 1 - 2016-2017 DSM Results as Compared to 2016-2018 Targets 6
Figure 2 - 2017 DSM Expenditures 9

ATTACHMENTS

Attachment 1 – Evaluator and Verifier Recommendation Updates

1 2017 DSM RESULTS

In its Order dated October 7, 2015, the Nova Scotia Utility and Review Board (UARB) approved ENS's 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.[1] The UARB Order approved a 2017 DSM investment of $34.0 million with corresponding net incremental energy savings of 136.5 GWh and net peak demand savings of 21.0 MW.

Table 1 provides a breakdown of the 2017 expenditures and the evaluated net incremental energy and net peak demand savings results by program, for comparison with the 2016-2018 DSM Plan Compliance Filing and the 2017 mid-course adjustments. Table 2 provides program participation data and Table 3 provides a breakdown of unit costs.

[1] See M06733, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* [NSUARB Order], [7 Oct 2015].

Table 1: 2017 Planned Savings, Mid-Course Adjustments, and Results

	2017 Plan as Filed				2017 Mid-Course Adjustment				2017 Results				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings[1] (GWh)	Peak Demand Savings (MW)	Budget ($ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings[1] (GWh)	Peak Demand Savings (MW)	Budget ($ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)[1]	Peak Demand Savings (MW)	Expenditures ($ million)	Program Status[2]
Residential													
Efficient Product Rebates	**12.6**	**122.7**	**1.1**	**3.3**	**22.6**	**339.8**	**3.6**	**5.2**	**22.6**	**202.2**	**3.0**	**4.2**	
Instant Savings					20.0	317.9	3.3	3.5	19.5	179.1	2.6	2.8	
Appliance Retirement					2.6	21.9	0.3	1.7	3.1	23.1	0.4	1.4	
Existing Residential	**43.3**	**847.5**	**7.9**	**10.6**	**33.4**	**538.3**	**6.5**	**8.2**	**27.9**	**351.4**	**7.2**	**7.2**	
Home Energy Assessment					5.4	144.5	1.3	2.2	7.0	140.1	2.0	2.3	
Green Heat					3.5	63.6	1.7	0.9	3.0	53.9	3.1	1.2	
Efficient Product Installation[3]					24.4	330.3	3.6	5.2	17.9	157.3	2.1	3.7	
New Residential	**3.9**	**117.0**	**1.1**	**1.3**	**4.0**	**139.3**	**0.9**	**1.8**	**3.4**	**101.2**	**1.0**	**1.4**	
New Home Construction					4.0	139.3	0.9	1.8	3.4	101.2	1.0	1.4	
Residential Subtotal	**59.8**	**1,087.3**	**10.1**	**15.2**	**60.0**	**1,017.3**	**11.1**	**15.3**	**53.9**	**654.8**	**11.1**	**12.8**	
Low Income[4]	7.8	151.3	1.0	1.8	9.5	128.4	1.4	2.4	9.0	79.3	1.2	2.2	
Business, Non-Profit and Institutional (BNI)													
Efficient Product Rebates	**32.6**	**428.6**	**5.3**	**5.7**	**37.2**	**410.3**	**5.9**	**6.2**	**46.6**	**547.1**	**7.3**	**6.8**	
Business Energy Rebates					37.2	410.3	5.9	6.2	46.6	547.1	7.3	6.8	
Custom Incentives	**34.1**	**522.7**	**4.3**	**6.5**	**30.5**	**380.0**	**2.2**	**6.0**	**22.4**	**320.2**	**3.9**	**4.2**	
Custom					24.8	374.3	1.9	4.8	21.0	316.1	3.6	3.7	
Energy Management Information Systems					4.0	4.0	0.1	0.5	1.4	4.1	0.3	0.2	
Strategic Energy Management[5]					1.7	1.7	0.2	0.7	0.0	0.0	0.0	0.3	
Direct Installation	**10.0**	**139.9**	**1.4**	**3.6**	**8.8**	**116.1**	**1.9**	**3.9**	**7.9**	**100.9**	**1.4**	**3.8**	
Small Business Energy Solutions					8.8	116.1	1.9	3.9	7.9	100.9	1.4	3.8	
BNI Subtotal	**76.7**	**1,091.2**	**11.0**	**15.8**	**76.5**	**906.4**	**10.0**	**16.1**	**76.9**	**968.2**	**12.5**	**14.8**	
Low Income[4]	-	-	-	-	4.0	50.1	0.6	0.9	5.5	69.3	1.1	0.9	
Programs Total	**136.5**	**2,178.4**	**21.0**	**31.0**	**136.5**	**1,923.8**	**21.0**	**31.3**	**130.7**	**1,622.9**	**23.7**	**27.6**	
Enabling Strategies	**-**	**-**	**-**	**3.1**	**-**	**-**	**-**	**3.3**	**-**	**-**	**-**	**2.8**	
TOTAL	**136.5**	**2,178.4**	**21.0**	**34.0**	**136.5**	**1,923.8**	**21.0**	**34.6**	**130.7**	**1,622.9**	**23.7**	**30.3**	

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures in previous quarters may have been updated and are reflected in the year-end totals.

[1] As agreed to in the UARB-approved 2016-2018 DSM Plan Consensus Agreement, ENS is now reporting on lifetime energy savings. See M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix D, Appendix "A", item 3(c)(iii) (available on CanLII). The methodology for estimating lifetime energy savings for the 2017 Mid-Course Adjustments and 2017 results is more sophisticated than that used in the UARB-approved 2016-2018 DSM Plan and remains under development and subject to change.

[2] Green denotes a variance of less than 10% below the planned annual energy savings, yellow denotes a variance of 10% to 25% below the planned annual energy savings, and red denotes a variance of greater than 25% below the planned annual energy savings. For more information on these variances, please refer to the relevant program description sections of this report.

[3] Efficient Product Installation (EPI) comprises the former Residential Direct Install (RDI) and Rental Properties and Condos (RPC) program components, within the Existing Residential Program. These two components merged to form EPI on January 1, 2017, facilitating the offering of a more consistent line of products in households across Nova Scotia.

[4] Reflects tracked and estimated participation by low-income participants; numbers are included in the overall Efficient Product Rebates (Residential and BNI), Existing Residential, Custom Incentives, and Direct Installation programs.

[5] Due to the start date of the 2017 Strategic Energy Management (SEM) participants, SEM did not have any participants who achieved savings in 2017; therefore, no evaluation was conducted for 2017. Please refer to section 1.3.2 for more information.

Table 2: 2017 Participation Rates

	2017 Actual	Participation Unit
Residential		
Efficient Product Rebates		
Instant Savings	710,540	Units rebated
Appliance Retirement	6,138	Units rebated
Existing Residential		
Home Energy Assessment	931	Housing units
Green Heat	1,629	Housing units
Efficient Product Installation	13,672	Housing units
New Residential		
New Home Construction	426	Participants
BNI		
Efficient Product Rebates		
Business Energy Rebates - Mail-In	33,205	Units rebated
Business Energy Rebates - Instant	315,867	Units rebated
Custom Incentives		
Custom	78	Projects
Energy Management Information Systems*	7	Participants
Strategic Energy Management*	2	Participants
Direct Installation		
Small Business Energy Solutions	417	Projects

Participation results reported in previous quarters may have been updated and are reflected in the year-end totals. Please refer to Table 10 for estimates of low-income participation in program components.

* Each participating EMIS and SEM project is counted once for the year, although participation in the program component is ongoing and most facilities generate savings every month.

Table 3: 2017 Unit Cost

	First-Year Unit Cost ($/kWh)		
	2017 Plan as Filed	Mid-Course Adjustment	2017 Actual
Residential			
Efficient Product Rebates	**0.26**	**0.23**	**0.19**
Instant Savings			
Appliance Retirement			
Existing Residential	**0.24**	**0.25**	**0.26**
Home Energy Assessment			
Green Heat			
Efficient Product Installation			
New Residential	**0.33**	**0.45**	**0.41**
New Home Construction			
Residential Subtotal	**0.25**	**0.25**	**0.24**
Low Income	0.23	0.25	0.25
BNI			
Efficient Product Rebates	**0.17**	**0.17**	**0.15**
Business Energy Rebates - Mail-In			
Business Energy Rebates - Instant			
Custom Incentives	**0.19**	**0.20**	**0.19**
Custom			
Energy Management Information Systems			
Strategic Energy Management			
Direct Installation	**0.36**	**0.44**	**0.48**
Small Business Energy Solutions			
BNI Subtotal	**0.21**	**0.21**	**0.19**
Low Income	-	0.23	0.17
Programs Total	**0.23**	**0.23**	**0.21**
Enabling Strategies	-	-	-
Total	**0.25**	**0.25**	**0.23**

First-year unit cost is provided to two decimal places due to the relative magnitude of the figures. ENS provides comment on unit cost variances (year-end unit cost as compared to mid-course adjusted unit cost) of 10 percent or more; please refer to the relevant program sections of this report for further information. Unit costs are calculated using energy and demand savings at the generator, net of free-ridership and spillover, and unaudited expenditure amounts.

1.1 2017 DSM Programs

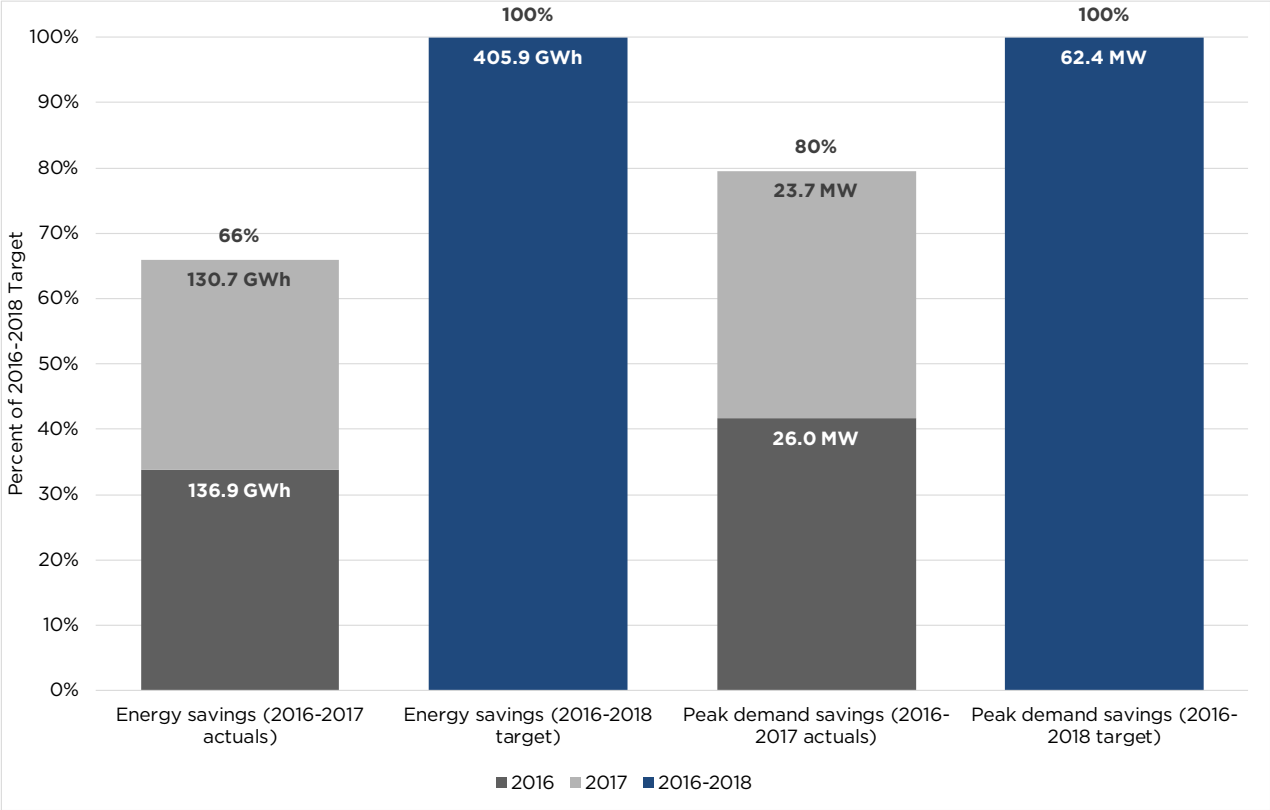
In 2017, ENS achieved total net incremental energy savings at the generator, for all DSM programs, of 130.7 GWh, compared to the planned savings amount of 136.5 GWh. Total net peak demand savings at the generator, for all DSM programs, were 23.7 MW, compared to the planned savings amount of 21.0 MW. Total expenditures were $30.3 million, compared to the mid-course adjusted planned investment of $34.6 million.[2] These savings and expenditures include results from both the Residential and the Business, Non-Profit and Institutional (BNI) sectors. Total ratepayer benefits resulting from 2017 energy savings are $121 million.[3] Individual program results are presented in the following sections and are compared to the 2017 mid-course adjustments at the program level.

Using the average NS Power emissions intensity for 2016, ENS's Evaluation Consultant found that DSM measures installed in 2017 will result in 85.4 kt of annual avoided CO_2e emissions; this is approximately the same as the CO_2e emissions produced annually by 18,000 cars. These greenhouse gas savings will persist for the life of installed measures, at a reduced impact each year, proportional to the average NS Power emissions intensity.

Figure 1 below shows ENS's progress to date towards the UARB-approved net incremental energy and net peak demand savings targets in ENS's 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.[4]

[2] In 2017, ENS's mid-course adjusted investment amount was $0.6 million greater than that identified in the Compliance Filing, bringing the total mid-course adjusted planned investment amount to $34.6 million. This adjustment includes a portion of the amount underspent by ENS in 2016 and carried forward to 2017.
[3] Lifetime benefits are expressed as the net present value of the avoided costs, including energy and capacity, over the life of the program measures.
[4] *Supra* note 1 at Schedule B. The Consensus Agreement was signed by representatives of EfficiencyOne, NS Power, the Consumer Advocate, the Small Business Advocate, the Industrial Group, the Affordable Energy Coalition, and the Ecology Action Centre.

Figure 1 - 2016-2017 DSM Results as Compared to 2016-2018 Targets



2016-2017 energy and demand savings are calculated at the generator and are net of free ridership and spillover. 2016 savings are evaluated and verified; 2017 savings are evaluated and pending verification.

Measurement and Evaluation

In 2017, ENS contracted two consultants to perform evaluation services. One evaluator conducted DSM program evaluations and the second conducted program support process evaluations (Marketing and Practices & Procedures). For simplicity, this document will refer to both of ENS's evaluation consultants as the Evaluation Consultant.

Further to the 2017 evaluated net incremental energy and net peak demand savings attributable to DSM programs, the 2017 evaluated net incremental energy savings for Codes and Standards were 21.9 GWh with net peak demand savings of 4.0 MW. Since savings from Codes and Standards occur outside of DSM programs, they are not included in ENS's overall actual savings.

In 2017, all program components underwent an impact and market evaluation with the exception of:

- Appliance Retirement, which was not recommended by the Evaluation Consultant for a market evaluation;[5] and
- Strategic Energy Management, which did not receive an impact or market evaluation since it did not claim any savings in 2017 (please refer to section 1.3.2 for further discussion).

Impact evaluations assess net incremental energy and net peak demand savings, while market evaluations characterize market conditions, assess program satisfaction, and monitor market evolution. For select program components, the market and impact evaluations were reduced as compared to 2016. This is a result of key savings and market parameters remaining stable for several years, as well as an absence of program changes expected to cause fluctuations in these parameters.[6]

Two program components also underwent process evaluations: Green Heat; and Custom (Retrofit service only). Process evaluations review program design, effectiveness of program administration and delivery, barriers to program delivery, effectiveness of tracking systems, and opportunities for improvement.

In addition, two program support process evaluations took place for:

- Marketing; and
- Practices and Procedures:
    - Training and development;
    - Business development; and
    - Incentive setting (in accordance with ENS's Incentive Setting Implementation Plan).

[5] This is as a result of consistent participant survey results in previous years due to a stable market and the maturity of the program component.
[6] The program components selected for reduced impact evaluations were Appliance Retirement, Instant Savings, Business Energy Rebates and Custom. Instant Savings was also selected for a reduced market evaluation. For more information regarding the rationale for reduced evaluations, please see the 2017 DSM Programs Evaluation Executive Summary, p. 5.

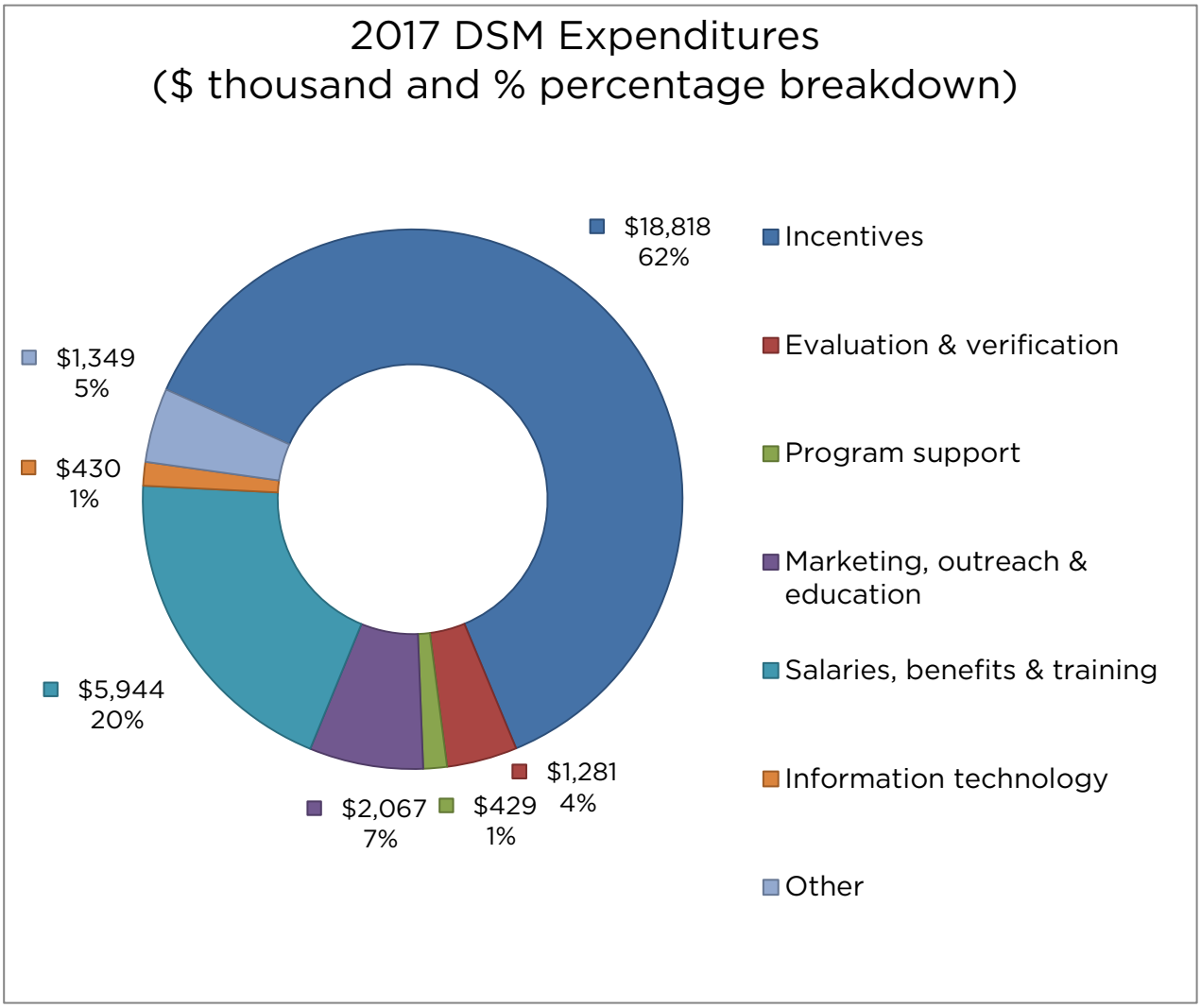
The 2017 Evaluation Reports are filed concurrently with this Annual Progress Report.

Rate Class Expenditures

ENS remains committed to reporting on rate-class expenditures, while aiming to achieve its planned energy savings within the approved investment amount. Please see section 4 for 2015, 2016 and 2017 planned and actual[7] DSM expenditures by rate class, and planned 2018 DSM expenditures by rate class. Figure 2 presents ENS's 2017 DSM expenditures.

[7] Expenditures for 2017 are unaudited.

Figure 2: 2017 DSM Expenditures



Expenditure amounts are unaudited and are rounded to the nearest thousand. Expenditure amounts reported in previous quarters may have been updated and are reflected in the 2017 annual total.

In 2017, ENS continued to provide programs and services for low- and modest-income homeowners and renters, other households, and a wide variety of businesses. Awareness of, and participation in, programs and services was facilitated through advertising, media engagements, social media, and community outreach initiatives.

ENS also continued working on a number of pilot projects within both the Residential and BNI sectors to build a diverse program and measure portfolio that responds to market needs. These initiatives were designed based on ENS's expertise in delivering electricity efficiency activities in Nova Scotia and are detailed in the relevant program sections below.

ENS continued to maintain its strong social media presence through platforms including Facebook, Twitter, Instagram, YouTube, and LinkedIn. Unaided awareness of ENS was 31 percent at the end of 2017. Customer service also remained a top priority in 2017, with ENS achieving a Customer Satisfaction Index of 89.7.

Data Tracking System

As identified in ENS's Compliance Filing for the 2016-2018 DSM Resource Plan,[8] ENS is implementing a new DSM data tracking system. The system is a commercial product called Dynamic DSM (DDSM), which is a Microsoft® platform, and will help participants by:

- providing improved service experience through enhanced tracking of participants' historical interactions; and
- enabling ENS to optimize communication with participants to provide better participant life-cycle messaging and marketing.

The system will create efficiencies for program delivery, research, and marketing purposes through:

- reduced time spent on data processing and reporting;
- a reduction in the number of external consultants required to develop reporting capabilities; and
- improved program uptake using database marketing techniques.

In 2017, ENS continued implementing the DDSM data tracking system with three program components being transitioned to the new system, along with the integration of the electronic Technical Reference Manual (eTRM) for those components (for more information on the eTRM, please see section 1.5.2).[9] Customer case management and

[8] M06733, *The Public Utilities Act, RSNS, 1989, c 380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities* [Compliance Filing], [15 Sept 2015] at Schedule E, p 24.

[9] The three program components are: Green Heat, Efficient Product Installation, and Appliance Retirement.

ENS's Efficiency Trade Network (ETN) list management functionality were also built into the system in 2017. In addition, testing continued on a measure library, distributor portal, and tracking components for BER (Instant Rebates) and Residential Instant Savings.

Implementation of the new DDSM data tracking system experienced delays in 2017 due to vendor development issues. ENS engaged with the vendor to mitigate risks associated with this delay.

1.2 Residential Sector Results

In 2017, the Residential sector achieved net incremental energy savings of 53.9 GWh and net peak demand savings of 11.1 MW compared to planned savings of 60.0 GWh and 11.1 MW, respectively. The Residential sector comprises the following programs:

- Efficient Product Rebates;
- Existing Residential; and
- New Residential.

The Residential sector achieved net peak demand savings that were disproportionately higher than the net incremental energy savings in 2017. This is primarily due to changes in program measure distribution in the 2017 mid-course adjustments resulting in a higher demand-to-energy ratio overall, as compared to the UARB-approved plan.

1.2.1 Efficient Product Rebates

In 2017, the Efficient Product Rebates (EPR) program achieved net incremental energy savings of 22.6 GWh and net peak demand savings of 3.0 MW, as compared to the mid-course adjusted planned savings amounts of 22.6 GWh and 3.6 MW, respectively. The EPR program comprises the following components:

- Instant Savings; and
- Appliance Retirement.

A breakdown of net incremental energy and net peak demand savings, expenditures, and participation by rate class for EPR is presented in Table 4, below.

Table 4: EPR Rate Class Results (Residential)

Residential Efficient Product Rebates (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ thousand)	Units Rebated (#)
Residential/Charitable (2,3,4)	22.2	198.2	2.9	4,141	703,536
Small General (10)*	0.0	0.2	0.0	9	44
General Demand (11)*	0.0	0.2	0.0	12	61
Large General (12)*	0.0	0.0	0.0	0	2
Small Industrial (21)*	0.0	0.0	0.0	1	6
Medium Industrial (22)*	0.0	0.0	0.0	1	5
Large Industrial (23, 25)*	0.0	0.0	0.0	1	4
Municipal (24)	0.4	3.6	0.1	69	13,020
Unmetered (999)	0.0	0.0	0.0	0	0
Total	**22.6**	**202.2**	**3.0**	**4,234**	**716,678**

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.
Residential Efficient Product Rebates includes the Appliance Retirement and Instant Savings program components. Appliance Retirement includes appliance replacements delivered through the HomeWarming service.
*The Appliance Retirement program component collects eligible residential appliances from BNI participants (e.g., rental apartment buildings, condominium buildings, non-profits, and universities on commercial rate codes), in addition to residential participants.

EPR saw a decrease in its net peak demand savings in 2017 as compared to the mid-course adjusted planned savings amount. This change was informed by ENS's 2016-2017 residential lighting metering study, to better estimate net peak demand savings, and resulted in a reduction in the energy-to-demand ratio for EPR.

The EPR unit cost for 2017 was 20 percent below the planned mid-course adjusted unit cost and was primarily influenced by an increase in the purchase of eligible ENERGY STAR® certified LED lighting product multi-packs in the Instant Savings program

component, as compared to previous years.[10] The multi-packs have a lower per-kWh rebate amount than the corresponding single-packs of qualifying lighting measures, resulting in lower incentive costs for the campaigns and contributing to better-than-anticipated value for ratepayers. This factor also affected EPR expenditures, which were lower than anticipated in the mid-course adjustment. In addition, there was a higher proportion of appliance retirements and a lower proportion of replacements than expected in Appliance Retirement. Appliance replacements incur a higher cost than appliance retirements due to the expense associated with the replacement of the appliance, so a reduction in the proportion of appliance replacements decreases overall costs.

Instant Savings

Instant Savings provides point-of-sale discounts to retail customers. In 2017, Instant Savings achieved 19.5 GWh of net incremental energy savings and 2.6 MW of net peak demand savings through the sale of over 710,000 energy-efficient products, the majority of which were ENERGY STAR® certified LED lighting products.

In Q2 of 2017, Instant Savings engaged in a review of incentive levels as a result of the observed shift in the market towards the purchase of multi-packs, and also to review the impact of the price-floor introduced in 2017. ENS also began collecting more detailed data from retail partners on the sales of ENERGY STAR® certified LED lighting products, both during and outside of campaign times, to assess the effect of ENS's campaign on product sales more definitively.

The 2017 fall Instant Savings campaign included a pilot project where a new "Indoor Air Quality" product category was added offering rebates on select ENERGY STAR® certified air purifiers, dehumidifiers, bathroom fans and kitchen range hood fans. The pilot saw higher-than-anticipated sales of appliances in this new category and as a

[10] This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to 2 decimal places due to the relative magnitude of the figures).

result, dehumidifiers and air purifiers will be added to the list of energy-efficient products available in Instant Savings for 2018.

Appliance Retirement

In 2017, the Appliance Retirement component of the EPR program achieved net incremental energy savings of 3.1 GWh and 0.4 MW of net peak demand savings. These savings were achieved through the retirement of 6,138 inefficient appliances, including those retired through a pilot project that began in 2016.[11] This pilot measure was permanently incorporated into the Appliance Retirement program component during Q3 of 2017. Of the total number of appliances retired, 386 appliances were replaced with energy-efficient models through the HomeWarming service.[12]

In 2017, Appliance Retirement began a pilot project in partnership with the Halifax Regional School Board (HRSB) to recycle eligible appliances from school properties. ENS worked with the HRSB Energy Manager to communicate with school administrators about the energy savings potential of appliance retirement and to coordinate appliance pick-ups. As a result, ten schools retired inefficient appliances in 2017.

1.2.2 Existing Residential

The Existing Residential program achieved net incremental energy savings of 27.9 GWh and 7.2 MW of net peak demand savings in 2017, compared to planned savings of 33.4 GWh and 6.5 MW, respectively. Existing Residential comprises the following components:

[11] Effective January 2016, Appliance Retirement began offering a $10 incentive on small appliances with an internal volume of less than 10 Cu. Ft., when accompanied by a full-size eligible appliance.
[12] HomeWarming provides low-income homeowners with a service that includes energy assessments and significant energy-saving home upgrades. Costs for appliance replacements in non-electrically heated homes are paid for by DSM funds.

- Home Energy Assessment (HEA);
- Green Heat; and
- Efficient Product Installation (EPI).

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the Existing Residential program is presented in Table 5, below.

Table 5: Existing Residential Rate Class Results

Existing Residential (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ thousand)	Housing Units (#)*
Residential/Charitable (2,3,4)	27.5	346.3	7.1	7,036	15,934
Small General (10)	0.0	0.1	0.0	2	4
General Demand (11)	0.0	0.0	0.0	0	0
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.0	0.0	0.0	0	0
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.4	5.0	0.1	120	294
Unmetered (999)	0.0	0.0	0.0	0	0
Total	**27.9**	**351.4**	**7.2**	**7,157**	**16,232**

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.
Existing Residential includes the Home Energy Assessment, Green Heat, and Efficient Product Installation program components.
The Home Energy Assessment program component mainly comprises homes heated by electricity. However, some participation includes homes heated primarily by non-electric fuels. As these homes generate a small amount of electricity savings, they receive a small amount of DSM funding.
*Includes apartments.

The EPI program component was the primary contributor to the shortfall from the Existing Residential mid-course adjusted planned net incremental energy savings; please see the corresponding EPI section below for more detail.

Existing Residential also saw an increase in the net peak demand savings as compared to the mid-course adjusted planned amount. This was a result of the program measure changes detailed in section 1.2, as well as the residential lighting metering study discussed in section 1.2.1. While the result of the metering study had a downward effect on demand savings, the program measure changes resulted in an overall increase in demand savings for Existing Residential.

Home Energy Assessment

HEA saw a strong 2017 achieving net incremental energy savings of 7.0 GWh and net peak demand savings of 2.0 MW in 2017 with 931 participants completing upgrades and receiving rebates. This represents an increase in participation over 2016, which saw 893 participants. HEA also saw an increase in the average savings per participant in 2017 as compared to 2016, primarily due to an increase in heat pump installations.

On September 1, 2017, ENS permanently transitioned to the updated EnerGuide Rating System[13] (ERS) from NRCan (Natural Resources Canada), which is used within HEA to generate Homeowner Upgrade Reports and determine the EnerGuide rating for homes.[14]

In 2017, the HEA Energy Action Plans (EAPs) underwent a review to assess their impact on upgrades and energy savings. These supplementary reports were developed to provide additional information to participants on items including estimated costs and simple payback periods. Following the release of the new EnerGuide Rating System and the associated Homeowner Upgrade Reports, ENS suspended the release of the HEA EAPs in Q4 of 2017.

[13] EnerGuide Rating System, version 15.
[14] The EnerGuide Rating System, first developed by NRCan in 1998, began as a unitless rating ranging from zero up a theoretical maximum of one hundred. On May 1, 2016, NRCan released a new version of the rating system, whereby the rating reflects the energy performance of the home, in energy units of gigajoules. The rating system reflects the modelled consumption of the home, with no upper limit to the score, and where zero GJ is the best rating a home could achieve, with the help of renewables, to offset its energy usage.

ENS launched its EnerGuide Real Estate Listing pilot in Q4, in partnership with the federal and Nova Scotia provincial governments, the Nova Scotia Realtors Association, and ViewPoint Realty Services. The innovative pilot gives homeowners the option to have EnerGuide information included with their home listing on the ViewPoint.ca real estate website.

HEA also began a review of its incentive structure and rebate guide in 2017, with the objective of increasing convenience and accessibility for potential participants.

Green Heat

Green Heat achieved net incremental energy savings of 3.0 GWh and net peak demand savings of 3.1 MW in 2017. Green Heat saw 1,629 participants in 2017 which represents the largest number in its history, and a significant increase in participation as compared to 2016. These results are due to the strong performance of high-efficiency ductless mini-split heat pumps (MSHPs), which were added to Green Heat in late 2015. MSHPs accounted for 87 percent of the total measures installed in Green Heat in 2017. Additional increases in participation are attributed to the new rebate structure (detailed further below), marketing and social media initiatives, process improvements, and increased partner engagement via the ETN.

On August 1, 2017, Green Heat implemented the following changes:

- Green Heat adopted a post-purchase, mail-in rebate structure;[15]
- the incentive structure for heat pump equipment changed from a flat rebate per system installed to a rebate per ton of installed heating capacity; and
- Green Heat began providing incentives for residential homes that are not primarily electrically heated to install a qualifying high-efficiency heat pump instead of a standard heat pump (Green Heat claims the incremental savings resulting from a participant installing a qualifying high-efficiency heat pump

[15] Prior to August 1, 2017, Green Heat applicants required pre-approval prior to purchasing and installing eligible systems.

instead of a standard heat pump). These new incentives capture what would otherwise be a lost opportunity.

Following the introduction of these changes, and the receipt of initial savings results, ENS determined that air-source heat pumps (centrally ducted), ground-source heat pumps, and air-to-water heat pumps for participants that were not primarily electrically heated did not produce energy savings high enough for the intended incentive to be cost-effective and these were subsequently removed from the list of qualifying measures on November 20, 2017.[16] Homes that are not primarily electrically heated can now only receive rebates when installing high-efficiency MSHPs.

Efficient Product Installation[17]

The majority of the 2017 Existing Residential savings are attributed to the EPI program component, which achieved 17.9 GWh of net incremental energy savings and 2.1 MW of net peak demand savings in 2017. Partner organizations installed nearly 380,000 energy-efficient products in over 13,000 residences across Nova Scotia, of which, approximately half self-identified as, or were estimated to be, low-income households.

EPI saw lower-than-anticipated net incremental energy savings in 2017 due to:

- fewer-than-anticipated participants; and

[16] Prior to the qualified measure change on November 20, 2017, participants were permitted 90 days to purchase and install their system before sending in their application. This resulted in some cases where applications were processed after November 20, 2017 due to participants having downloaded the application before the changes were incorporated.

[17] EPI consists of the former Residential Direct Install (RDI) and Rental Properties and Condos (RPC) program components within the Existing Residential program. These two components merged to form EPI on January 1, 2017, facilitating the offering of a more consistent line of products in households across Nova Scotia Efficient Product Installation (EPI) was previously referred to as Residential Direct Install (RDI) in the 2017 Mid-Course Adjustment filing within ENS's 2017 DSM Annual Progress Report (see M07964, *The Public Utilities Act, RSNS 1989, c 390, as amended and Efficiency Nova Scotia's 2017 Annual Progress Report* [ENS 2017 DSM Annual Progress Report], [31 Mar, 2017]). The RDI program component name was changed to EPI in 2017 to more accurately reflect the service offered, however, the mid-course adjusted plan amounts remain the same.

- lower-than-anticipated energy savings per participant.[18]

Lower-than-expected participation in EPI also affected the annual expenditures for Existing Residential, which were lower than anticipated as compared to the 2017 planned mid-course adjusted amount. This is a result of the reduction in the number of measures installed through the EPI program component.

In Q4 of 2017, EPI offered LED holiday lights as a pilot measure in conjunction with standard upgrades. ENS offered participants one set of LED lights in exchange for two sets of traditional incandescent lights, with a limit of two sets of LED lights per household. A total of 1,319 sets of holiday lights were exchanged in EPI participants' homes.

1.2.3 New Residential

In 2017, the New Residential program, marketed as New Home Construction (NHC), achieved 3.4 GWh of net incremental energy savings and 1.0 MW of net peak demand savings as compared to the mid-course adjusted planned savings of 4.0 GWh and 0.9 MW, respectively.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the New Residential program is presented in Table 6, below.

[18] More products were installed per EPI participant in 2017 due to a higher proportion of single-family homes participating than apartments (homes of a larger dwelling size typically have more installation opportunities), however, fewer A-type lamp replacements occurred in single-family homes in 2017 as compared to 2016. This is largely due to the decreasing number of lighting sockets occupied by incandescent bulbs. This is likely due to participants replacing incandescent bulbs with other lighting technologies as they burn out, but prior to participation in EPI. Please refer to the 2017 Existing Residential Evaluation Report for further information.

Table 6: New Residential Rate Class Results

New Residential (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ thousand)	Participants (#)
Residential/Charitable (2,3,4)	3.2	97.1	0.9	1,258	403
Small General (10)	0.0	0.0	0.0	0	0
General Demand (11)	0.0	0.0	0.0	0	0
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.0	0.0	0.0	0	0
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.1	4.1	0.0	126	23
Unmetered (999)	0.0	0.0	0.0	0	0
Total	**3.4**	**101.2**	**1.0**	**1,383**	**426**

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.
New Residential includes the New Home Construction program component.

NHC saw an increase in registrations in 2017 compared to 2016, however, fewer projects were completed than expected, resulting in a shortfall in net incremental energy savings as compared to the mid-course adjusted planned savings.

This is primarily due to one of the largest NHC Service Providers transitioning out of the program in 2017. ENS worked closely with the Service Provider to assist them in navigating the exit and to aid in the completion of the Service Provider's remaining projects. In addition, a number of participants working with the exiting Service Provider were assisted by ENS in transitioning to other Service Providers. This also affected the expenditures for 2017, which were lower than anticipated as compared to the mid-course adjustment, due to fewer incentives being issued.

To address program participants' ongoing feedback indicating a need for higher incentives to facilitate building energy-efficient homes, as well as Evaluation Consultant

and Savings Verification Consultant recommendations, ENS updated its NHC incentives in Q2 of 2017.[19]

In 2016, ENS launched a Passive House pilot to encourage more Passive House construction, as well as energy modeling in Passive House Planning Package (PHPP) or WUFI® Passive for single-family new home construction. In 2017, six projects were completed with additional completions anticipated in 2018. Energy savings generated from these homes will have longer measure lives (achieving greater lifetime energy savings) than non-Passive House NHC projects.

As noted above in the *Home Energy Assessment* section, in Q3 of 2017, ENS transitioned to the updated ERS from NRCan, which is used within NHC to rate the energy efficiency of home plans and completed projects.

1.3 Business, Non-Profit and Institutional Sector Results

The Business, Non-Profit and Institutional (BNI) sector achieved net energy savings of 76.9 GWh and 12.5 MW of net peak demand savings in 2017, compared to its planned savings of 76.5 GWh and 10.0 MW, respectively. The BNI sector comprises the following programs:

- Efficient Product Rebates;
- Custom Incentives; and
- Direct Installation.

For BNI programs, ENS continued its On-site Energy Manager (OEM) partnership initiative in 2017. Under this initiative, ENS places an energy manager within a large organization to identify new energy-efficiency projects and to support the organization

[19] New Home Construction Program*, 2015 DSM Evaluation: Efficiency Nova Scotia,* Final Report, 3 March 2016, Econoler at Recommendation 2015 NHC-R2; Verification Review of Program Year 2015 Evaluation Results: Report for the Nova Scotia Utilities and Review Board, 31 May 2015 [*sic*], H. Gil Peach & Associates/Scan America® at p 43-44; and New Residential Program*, 2016 DSM Evaluation: Efficiency Nova Scotia,* Final Report, 8 March 2017, Econoler at p. 5 and 24.

in advancing these projects. OEM services are paid for by the organization, in part through a recovery on project incentives. In 2017, two additional OEM partnerships began, bringing the total number of placements to six. Savings from the OEM service are claimed within the three BNI programs listed above.

The BNI sector achieved net peak demand savings that were disproportionately higher than the net incremental energy savings in 2017. This is primarily due to changes in program measure distribution in the 2017 mid-course adjustments resulting in a higher demand-to-energy ratio overall, as compared to the UARB-approved plan.

1.3.1 Efficient Product Rebates

Efficient Product Rebates, marketed as Business Energy Rebates (BER), achieved net incremental energy savings of 46.6 GWh in 2017 and 7.3 MW of net peak demand savings, compared to the planned savings of 37.2 GWh and 5.9 MW, respectively.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the BNI EPR program is presented in Table 7, below.

Table 7: EPR Rate Class Results (BNI)

BNI Efficient Product Rebates (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ thousand)	Units Rebated (#)
Residential/Charitable (2,3,4)*	2.9	34.2	0.5	445	22,601
Small General (10)	2.8	33.6	0.4	447	20,049
General Demand (11)	28.6	340.1	4.7	4,070	198,034
Large General (12)	3.1	36.3	0.4	421	26,902
Small Industrial (21)	2.8	29.9	0.4	437	25,270
Medium Industrial (22)	2.2	26.1	0.3	282	23,095
Large Industrial (23, 25)	2.5	28.1	0.3	382	19,596
Municipal (24)	1.7	18.7	0.3	341	13,525
Unmetered (999)	0.0	0.0	0.0	0	0
Total	**46.6**	**547.1**	**7.3**	**6,825**	**349,072**

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end results.
BNI Efficient Product Rebates includes the BER program component.
*EPR (BNI) includes some residential customers as eligible participants (e.g., farms, community groups on charitable rate codes, rental apartment buildings, and condominium buildings).

EPR achieved its highest energy savings levels in the program's history through the sale of over 349,000 energy-efficient products through the Instant Rebates and Mail-In services. The Instant Rebates service observed continued growth and increased participation in 2017 as compared to recent years, while the number of Mail-In projects has remained relatively constant.

In 2017, BER was expanded to include pool equipment as a new measure category. The most popular measures continue to be lighting and heating, ventilation, and air conditioning (HVAC).

EPR's strong energy and demand savings results are attributed to additional Business Development Manager and OEM support, along with momentum gained as a result of marketing efforts that took place in late 2016.

As a result of the increase in participation observed, program expenditures also increased as compared to the amount forecast in the mid-course adjustment, however, the EPR unit cost was reduced by 13 percent.[20] The stronger-than-anticipated performance of the Instant Rebates service, which has a lower unit cost than that of the Mail-In service, contributed to the reduction in the unit cost, thus resulting in better-than-anticipated value for ratepayers.

BER also underwent a process improvement exercise in 2017, resulting in revisions to the website and streamlining of the application process to enhance the participant experience.

1.3.2 Custom Incentives

The Custom Incentives program achieved net incremental energy savings of 22.4 GWh and 3.9 MW of net peak demand savings in 2017, as compared to the planned savings amounts of 30.5 GWh and 2.2 MW, respectively. Custom Incentives comprises the following program components:

- Custom;
- Energy Management Information Systems (EMIS); and
- Strategic Energy Management (SEM).

In 2017, Custom Incentives supported innovative projects that did not qualify for other ENS programs by offering technical assistance, financial incentives, and project financing to participants to aid in the reduction of their electricity consumption and demand.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for Custom Incentives is presented in Table 8, below.

[20] This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

Table 8: Custom Incentives Rate Class Results

Custom Incentives (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ thousand)	Projects (#)
Residential/Charitable (2,3,4)*	0.2	2.4	0.0	36	1
Small General (10)	0.0	0.0	0.0	0	0
General Demand (11)	8.6	130.1	1.4	1,500	28
Large General (12)	4.0	59.8	1.4	765	13
Small Industrial (21)	2.0	30.6	0.1	439	8
Medium Industrial (22)	3.2	43.5	0.5	505	17
Large Industrial (23, 25)	3.5	41.7	0.3	766	17
Municipal (24)	0.9	12.1	0.2	190	2
Unmetered (999)	0.0	0.0	0.0	0	0
Total	**22.4**	**320.2**	**3.9**	**4,202**	**87**

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.
Custom Incentives includes the Custom, EMIS, and SEM program components. EMIS and SEM participants are each counted once, but their participation is ongoing throughout the year.
*Custom Incentives includes some residential customers as eligible participants (e.g., farms, community groups on charitable rate codes, rental apartment buildings, rental apartment buildings, and condominium buildings).

Custom Incentives fell short of its 2017 planned net incremental energy savings as a result of lower-than-anticipated savings in each of the three Custom Incentives program components; please refer to the discussions below for further information. Custom Incentives expenditures were also reduced, in alignment with the shortfall in net incremental energy savings.

Custom observed a significant increase in the net peak demand savings as compared to the mid-course adjusted planned amount. This is due to program measure changes as well as the realization of unanticipated demand savings in the New Construction service (within the Custom component) that were credited through the evaluation process.

Custom

The Custom component of the Custom Incentives program generated 21.0 GWh of net incremental energy savings and 3.6 MW of net peak demand savings in 2017 from 78 projects.

The Custom component comprises three separate services: Retrofit; Building Optimization; and New Construction. These services saw 146, 34 and 29 projects initiated in 2017, respectively, representing a 55 percent increase over the number of project initiations in 2016.[21]

The Retrofit service claimed savings from 64 projects in 2017, accounting for the majority of savings achieved through the Custom component, with projects spanning a wide variety of sectors, including:

- water and wastewater treatment;
- seafood processing and aquaculture;
- commercial office space;
- new construction; and
- institutional.

The greatest savings from the Retrofit service in 2017 came from HVAC, followed by compressed air, and refrigeration.

In 2017, seven projects generated savings in the Building Optimization service through the implementation of no-cost or low-cost energy-efficiency measures identified through a recommissioning process.

[21] Project initiation is defined by the date a project is created in the Data Management System. This typically occurs when ENS receives a Scoping Study, Feasibility Study Proposal or Feasibility Study Report.

The New Construction service also achieved savings from seven projects in 2017. This service encourages participants to make decisions that are informed by their anticipated operating costs, and offers technical support and incentives resulting in electricity savings in new BNI buildings, as well as major renovations to existing buildings.

The Custom component initiated five pilots in 2017, as follows:

- offering participants incentives to repair compressed air leaks identified through a leakage audit;
- providing participants with a compressed air flow meter to quickly identify when their air leakage rate has increased;
- providing a refrigeration optimization audit to industrial and commercial participants with the goal of identifying potential improvements for their system;
- providing a service incenting high-quality commissioning of new commercial buildings; and
- investigating the viability of building envelope air leakage repairs in commercial buildings.

Custom saw fewer-than-anticipated project completions in 2017 as well as lower-than-expected net incremental energy savings per participant. A number of Custom projects expected to complete in 2017 were affected by participant-driven timeline delays; these projects are now expected to complete in 2018 as a result. This contributed to the shortfall in the net incremental energy savings for Custom Incentives, as compared to the planned savings amount for 2017.

Energy Management Information Systems

EMIS achieved net energy savings of 1.4 GWh and net peak demand savings of 0.3 MW in 2017. EMIS aims to help institutional and industrial participants use energy consumption data from metered systems to inform their process decisions. This involves helping participants conduct an EMIS audit, develop an EMIS implementation plan, and implement the EMIS plan (involving the installation and configuration of metering and monitoring equipment, and training and organizational support).

EMIS savings were lower than anticipated in 2017 as a portion of participants had not advanced as far in their EMIS implementation as forecasted at the time of the 2017 mid-course adjustment.

Strategic Energy Management

SEM focuses on operational and procedural changes that companies can make to reduce their energy usage. This is done by establishing energy teams within participating organizations and developing strategic energy management plans that include:

- facilitated workshops for energy team members;
- energy assessments;
- energy mapping and monitoring;
- tracking and reporting; and
- employee engagement activities.

In past years, SEM used a cohort delivery model to promote collaboration between industries. Due to difficulty filling the 2017 SEM cohort spaces, SEM participants did not begin until October. As a result of the revised start date, ENS did not evaluate or claim SEM savings in 2017; savings generated by these participants will be claimed in 2018. ENS is actively working to increase SEM participation, as detailed further in section 3.2.2.

1.3.3 Direct Installation

The Direct Installation program, marketed as Small Energy Business Solutions (SBES), achieved net incremental energy savings of 7.9 GWh and net peak demand savings of 1.4 MW in 2017, as compared to the planned mid-course adjusted savings of 8.8 GWh and 1.9 MW, respectively.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the SBES program is presented in Table 9, below.

Table 9: Direct Installation Rate Class Results

BNI Direct Installation (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ thousand)	Projects (#)
Residential/Charitable (2,3,4)	1.1	15.0	0.2	513	69
Small General (10)	0.8	10.5	0.1	389	78
General Demand (11)	5.4	68.2	0.9	2,632	252
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.4	5.4	0.1	134	10
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.1	1.7	0.0	85	8
Unmetered (999)	0.0	0.0	0.0	0	0
Total	**7.9**	**100.9**	**1.4**	**3,753**	**417**

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.
Direct Installation includes the Small Business Energy Solutions program component.

In 2017, SBES saw 417 projects, a significant increase over the prior year, resulting in an increase in net incremental energy savings of over 90 percent as compared to 2016. This positive trend is attributed to process enhancements made in 2016 resulting in an increased uptake of SBES as well as an increase in the number of projects generated through, and referred from, contractors. During 2017, SBES continued to enable participants to find contractors through the ETN or use a contractor of their choosing.

Despite this positive trend, SBES fell short of its 2017 planned mid-course adjusted savings as a result of lower-than-anticipated savings generated through the Multifamily Affordable Housing Pilot. This pilot, which began in 2016, provides affordable-housing owners with incentives for building-wide, energy-retrofit projects. The delivery of this pilot uses the same framework as the SBES delivery model, with the addition of an affordable-housing criterion rather than an energy consumption requirement. The pilot achieved the initial target level of participation by the end of 2016 with 17 participants undergoing an energy audit to identify energy-efficient upgrade opportunities. Participant feedback indicated that additional time is needed to make decisions

regarding the energy-efficient upgrades recommended in the upgrade reports and that pilot participants did not have sufficient available capital even with the incentive levels being offered. In 2017, SBES continued to work with pilot participants to support them in implementing the recommended changes and, as a result, saw the completion of ten projects for two pilot participants.

SBES's energy savings were also affected by the evaluation process, which saw a reduction in the net incremental energy savings as compared to the planned savings and ENS's tracked results for 2017. This was a result of baseline adjustments for specific products and adjustments to hours-of-use for particular measures. This did not affect SBES expenditures, which were aligned closely with the mid-course adjusted planned amount.

SBES also saw lower-than-anticipated net peak demand savings due to a lower-than-anticipated number of energy-efficiency upgrades taking place for the Multifamily Affordability Housing Pilot, as well as adjustments made to peak demand savings through the evaluation process; please refer to the Direct Installation Evaluation report for further information.[22]

1.4 Low Income Highlights

Within the Residential and Business, Non-Profit and Institutional (BNI) results highlighted in Table 1, ENS supported the following work for low-income Nova Scotians in 2017 (based on direct information where provided or demographic data):

- 6,882 low-income Nova Scotians received free installation of low-cost energy efficiency measures through the Efficient Product Installation program component;
- 466 low-income participants received rebates to replace or retire old, inefficient appliances;

[22] Direct Installation Program, *2017 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 15 March 2017, at p. 29.

- 30,690 units were sold or replaced through the Residential and BNI Efficient Product Rebates programs, via the Residential Instant Savings program component and the BNI Business Energy Rebates (Instant Rebates service) program component; and
- 64 apartment buildings received rebates through BNI programs, resulting in energy savings for the low-income Nova Scotians who live in those buildings.

SBES Affordable Multifamily Housing Pilot

As indicated above, in late 2016, ENS launched an SBES pilot for affordable housing owners, called the SBES Affordable Multifamily Housing Pilot. The pilot provides energy audits, upgrade recommendations, and building-wide efficient product installations. Please refer to section 1.3.3 for additional information on this pilot.

Incidental Low-Income Impacts

In addition to HomeWarming and the SBES Affordable Multifamily Housing Pilot, which are dedicated offerings for low-income Nova Scotians, ENS generates incidental low-income impacts through programs that are not specifically targeted at this segment. For example, a portion of efficient product installations are performed in low-income households. ENS has used a variety of methods, where appropriate on a program-by-program basis, to estimate the proportion of low-income energy savings, program costs, and participation in these programs, which are presented in Table 10, below.

Table 10: Low Income Results

Low Income Participation (2017 Actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures ($ million)	Participation (#)	Participation Unit
Residential Programs						
Efficient Product Rebates	**0.6**	**4.9**	**0.1**	**0.3**		
Instant Savings[1]	0.3	2.5	0.0	0.0	4,725	Units rebated
Appliance Retirement[1,2]	0.3	2.4	0.0	0.3	466	Units rebated
Existing Residential	**8.5**	**74.4**	**1.1**	**1.9**		
Home Energy Assessments[3]	-	-	-	-	-	
Green Heating Systems[3]	-	-	-	-	-	
Efficient Product Installation Service[4]	8.5	74.4	1.1	1.9	6,882	Housing units
New Residential	**0.0**	**0.0**	**0.0**	**0.0**		
New Home Construction[3]	-	-	-	-	-	
Residential Subtotal[9]	**9.0**	**79.3**	**1.2**	**2.2**	**12,073**	
Business, Non-Profit and Institutional (BNI) Programs						
Efficient Product Rebates	**3.8**	**45.1**	**1.0**	**0.5**		
Business Energy Rebates - Mail-In[6,7]	1.3	15.8	0.5	0.2	42	Buildings retrofitted
Business Energy Rebates - Instant[6,8]	2.5	29.2	0.5	0.4	25,965	Units rebated
Custom Incentives	**1.4**	**20.9**	**0.1**	**0.2**		
Custom[6,7]	1.4	20.9	0.1	0.2	11	Buildings retrofitted
Energy Management Information Systems[3]	-	-	-	-	-	
Strategic Energy Management[3]	-	-	-	-	-	
Direct Installation	**0.3**	**3.4**	**0.1**	**0.1**		
Small Business Energy Solutions[6,7]	0.3	3.4	0.1	0.1	11	Buildings retrofitted
BNI Subtotal[9]	**5.5**	**69.3**	**1.1**	**0.9**	**26,029**	
Programs Total[9]	**14.5**	**148.6**	**2.3**	**3.1**	**38,101**	

Includes estimates of low-income participation in program components where income is not disclosed. Estimates reported in previous quarters may have been updated and are reflected in the YTD totals. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited.

[1] Low-income Nova Scotians are assumed to be 10 percent as likely to participate as the general population; this assumption may be revised in the future as ENS further refines its methodology for calculating low-income participation rates relative to the general population.

[2] Includes appliance replacements delivered through the HomeWarming service.

[3] Participation by low-income Nova Scotians is assumed to be zero.

[4] Income disclosure is optional for program participation. Low-income participants are tracked where income information is available (88% of projects); otherwise low-income Nova Scotians are assumed to participate in proportion to the general population within each county.

[5] Includes projects through Housing Nova Scotia (HNS); for non-HNS projects, the proportion of low-income tenants in participating apartments is assumed to be the same as the proportion of low-income tenants in Nova Scotia apartments overall.

[6] Although the program participants are building owners, the avoided energy benefits are assumed to flow through to tenants; the proportion of low-income tenants in participating apartments is assumed to be the same as the proportion of low-income tenants in Nova Scotia apartments overall.

[7] Participation numbers are totals that include varying proportions of low-income and non low-income tenants. Expenditure and savings are estimated for the low-income portion.

[8] The exact installation location of products receiving Business Energy Rebates (BER) Instant Rebates is unknown. The proportion of BER Instant Rebates measures installed in apartments is assumed to be the same as the proportion of BER Mail-In Rebates installed in apartments.

[9] Participant Total contains mixed units, i.e. the sum of all participants listed by program component.

1.5 Enabling Strategies

Enabling Strategies played a strong role in enabling energy-efficiency services and programs to continue achieving savings in 2017. Enabling Strategies indirectly facilitate future savings within programs and have three key objectives:

- increase awareness of, and education about, DSM programs and services, which is key to driving participation in energy-efficiency activities;
- evolve DSM services through innovation and improve delivery of these services to Nova Scotians; and
- drive market transformation.

2017 Enabling Strategies categories included:

- Education and Outreach;
- Development and Research; and
- Other Enabling Strategies.

1.5.1 Education and Outreach

Education and Outreach strategies in 2017 focused on encouraging participation in DSM programs by increasing Nova Scotians' awareness of the value of energy efficiency.

Engagement and reach across all social media platforms remained strong in 2017 with ENS achieving an increase in Instagram followers of 75 percent and an increase in Facebook "likes" by 17 percent, as compared to 2016. Twitter (all channels) and LinkedIn followers also increased by ten percent and nine percent, respectively. In addition, there were more than 153 media mentions during 2017, representing an increase over 2016.[23]

[23] Includes references to both ENS and EfficiencyOne.

ENS was also featured in a number of publications in 2017, including the Halifax Chamber of Commerce's *Business Voice* magazine, the *Inverness Oran* newspaper, and *Seafood Alliance* magazine, highlighting ENS's energy partnerships with Nova Scotia businesses and municipalities.

ENS continued its Green Schools program in 2017, with over 250 schools now taking part, which is over half of all schools in Nova Scotia. Five engagement officers worked to support and provide resources to teachers and Green Team leaders with the goal of enhancing environmental sustainability at schools.

Green Schools Nova Scotia also participated in a variety of community events, presentations and initiatives during 2017, including:

- 22 *Earth Day* related engagements across the province on April 22, 2017;
- a presentation at the EECOM (Canadian Network for Environmental Education and Communication) Conference in May, 2017;
- *Energy Efficiency Day*, co-hosted with ENS at the Halifax Central Library on June 3, 2017; this event offered educational workshops and activities and showcased Nova Scotia's energy efficiency industry;
- *FreshFest* at the Halifax Central Library on September 10, 2017;
- Hants County Exhibition in September, 2017, where engagement officers demonstrated the benefits of having a well-insulated and air sealed home, with the use of ENS's Passive House display;
- becoming an active member of the Environmental and Sustainability Education Caucus;
- *Energize Bridgewater* from October 27-28, 2017; and
- the Girl Guides Canada Provincial Guiders Conference on November 25, 2017, where there were over 300 attendees.

Partnerships between ENS and Nova Scotia's leading post-secondary institutions help foster a culture of efficiency in Nova Scotia and educate tomorrow's workforce on the benefits of efficiency for our economy and environment. In 2017, ENS continued to

sponsor courses in energy efficiency and renewable energy at Saint Mary's University and Dalhousie University. The objective of these interdisciplinary courses is to build capacity in Nova Scotia's renewable energy and energy-efficiency sectors, demonstrate models available to deliver energy-efficiency programs, profile careers in the industry, and encourage development in sustainable energy. ENS also partnered with the Nova Scotia Community College (NSCC) to develop a $1,500 scholarship award, called the Efficiency Nova Scotia Bright Student Award.

ENS hosted its Bright Business Conference again in 2017. The conference was well attended, with over 250 participants and provided professional development with various breakout sessions throughout the day to encourage businesses to incorporate energy efficiency into their operations. Businesses from across the province won energy-efficiency awards in five categories.

Additional 2017 Education and Outreach initiatives and activities included:

- connecting with Nova Scotians at a variety of information sessions, events, home shows and trade shows across the province to highlight ENS's residential program offerings to increase energy-efficiency literacy; this included visiting approximately 21 communities across Nova Scotia as part of ENS's Summer Events program in 2017;
- presenting at the Core Energy Conference and the Annual General Meeting of the World Energy Cities Partnership (WECP) in Halifax;
- presenting to several organizations, businesses and community groups across the province, including the Atlantic Canada Opportunities Agency (ACOA), The Women's Insurance Board, Girl Guides Canada and several seniors' groups;
- partnering with the Ecology Action Centre (EAC) to encourage a culture of efficiency in Nova Scotia. The EAC assists ENS by identifying and working with non-profit organizations throughout the province to create and implement energy management plans and to assist qualifying organizations to take part in ENS programs and services;

- releasing the 2016 EfficiencyOne Annual Report (distinct from the ENS Annual Progress Report);
- releasing ENS's *The Switch* Residential monthly e-newsletter and *The Switch* BNI bi-monthly e-newsletter; and
- distributing of the *Efficiency Connection* newsletter to local elected leaders, including MLAs and MPs.

Other 2017 highlights included ENS's New Home Construction Program Manager being awarded the Canada Green Building Council's Atlantic Chapter's Emerging Green Leader Award, and EfficiencyOne's Board Chair and CEO being named as recipients of Canada's 2018 Clean50 award for their industry-leading efforts promoting energy efficiency and reducing CO_2 emissions in Nova Scotia. ENS also presented awards at the Canadian Home Builders Peak Awards and received recognition for its work in the energy efficiency home-building field.

1.5.2 Development and Research

Development and Research activities during 2017 focused largely on the following initiatives:

- Incentive Setting Methodology implementation;
- Small Business Energy Study;
- electronic Technical Reference Manual (eTRM); and
- additional activities.

Further detail on these initiatives can be found below. Please refer to section 5.4 for further information on the Incentive Setting Methodology implementation.

Small Business Energy Study

During the 2016-2018 DSM Resource Plan regulatory process, the Small Business Advocate (SBA) requested that ENS undertake a Small Business Energy Study (the Study) with the scope to be developed in consultation with the SBA.

ENS and the SBA collaborated to develop the Scope of Work for the Study in 2016. The Study was conducted in the first-quarter of 2017 and will be used to better understand this market segment and the barriers faced by small businesses looking to participate in DSM programs.

Electronic Technical Reference Manual

In 2017, ENS completed its electronic Technical Reference Manual (eTRM). The eTRM is a web-based tool for storing measure-level energy and demand savings methodologies and will be fully operational once the new data tracking system is complete. Like a conventional paper TRM, the eTRM allows users to view the methodology used to calculate savings, as well as offering additional functionality and a number of benefits unique to electronic TRMs, including:

- for any given energy-efficiency measure, the eTRM serves as both a record of the applicable methodology as well as the mechanism by which savings are calculated (as opposed to using separate sources for these two functions), which can reduce error and duplication;
- a direct interface with the DDSM data tracking system to store calculation outputs from the eTRM; and
- enhanced transparency by maintaining a record of past versions if a methodology is updated, as well as a record of the period over which the methodology was active.

The eTRM is an embedded application that is integrated with ENS's DDSM data tracking system and as a result, it cannot be easily viewed or filed in isolation. ENS will make the

eTRM available for the Evaluation Consultant and Savings Verification Consultant to review and assess at the ENS offices.

The eTRM will be integrated into daily operations as the new DDSM data tracking system is developed. The eTRM is discussed further in ENS's 2017 Q3 DSM Report, filed on November 30, 2017.

Additional Activities

Additional ENS development and research activities in 2017 included recurring research to track quality assurance, participant satisfaction, and other attitudinal metrics among the general population of Nova Scotia households, to help ENS respond to changing market conditions. This research indicated that ENS's influence on helping households reduce their energy consumption remained high at 30 percent in 2017. Quality assurance and participant satisfaction surveys were also completed for applicable program components as well as participant research undertaken to understand and improve the experience at each stage of the participant journey. Finally, ENS completed a review of the economic impact of the energy-efficiency industry in Nova Scotia.

ENS also collected user experience and other behavioural information from various participant and non-participant segments. The goal of this research was to understand participant experience and behaviours as they move through various touch points with ENS. Insights gained will be used guide improvements to user experience and messaging, to help participants get the most from the energy savings opportunities available to them.

1.5.3 Other Enabling Strategies

Other Enabling Strategies included the following sub-categories in 2017:

- PACE Financing;
- Capacity Building;

- Working with Governments; and
- Regulatory Affairs.

PACE Financing

ENS recognizes that a lack of access to capital can be a barrier to potential participants adopting energy-efficiency measures. ENS strives to offer innovative financing options to help compensate for this barrier and to increase participation in DSM programs. In ENS's experience, financing programs complement, but do not replace, traditional rebate programs.

Property Assessed Clean Energy (PACE) programs enable participants to pay for energy-efficiency upgrades through an add-on to their municipal account (a Local Improvement Charge). Although the PACE financing program is funded through the participating municipality and the Province of Nova Scotia, and therefore outside of DSM programs, it enables DSM work by providing Existing Residential participants with an additional financing option.

In 2017, ENS administered PACE programs for two municipalities and their residents. In total, eight municipalities are offering PACE financing to homeowners for energy-efficiency measures, and ENS continues to support these electrically-heated PACE participants with standard HEA rebates.

Capacity Building

Capacity Building strategies in 2017 focused on:

- enhancing quality assurance and existing training for ENS contractors and partners;
- providing marketing support for contractors and delivery partners;
- fostering the introduction of the Passive House concept in Nova Scotia; and
- promoting new home building standards.

Activities related to the Supplier Performance Management program, in order to improve cost and scheduling efficiencies as well as the participant experience, included:

- the procurement and awarding of Quality Assurance Auditor and Site Inspector contracts to collect Delivery Agent performance information for ENS;
- Service Provider training;
- distribution of Service Provider workloads across ENS programs and geographic regions to reduce travel cost and establish more consistency for contractors; and
- collaboration across ENS programs and departments to schedule site visits in a manner that limits the number of times participants are contacted following program participation.

2017 saw ENS continue to support and grow the energy-efficiency industry in Nova Scotia through its ETN, the goal of which is to develop a network that will, through education and engagement:

- drive energy savings and increase participation in ENS services;
- build industry capacity for energy-efficiency work in Nova Scotia; and
- deliver demonstrable value to its members.

In 2017, the ETN continued to build on momentum gained through efforts undertaken in 2016 with highlights, including:

- the release of two mandatory training modules for ETN members on the topics of customer service and ENS services;
- the launch of an enhanced online directory with improved navigation features and search function capability;
- an ETN advertising campaign in Q2, which resulted in an increase in ETN membership;
- province-wide information sessions on the Green Heat program component changes hosted by ENS, providing the opportunity for in-person feedback and questions;
- the launch of online ‘Helpful Guides’ to assist participants in hiring contractors, comparing quotes, and more; and

- the distribution of six issues of *The Network News*, the ETN's bi-monthly newsletter that highlights updates on programs, pilots, procurement opportunities, helpful tips, training, events, and more.

ENS continued to strengthen its relationship with industry stakeholders throughout 2017 by hosting, sponsoring and assisting in organizing training and events, and by offering exclusive discounts to ETN members who attended. Events included:

- An ENS-sponsored training course on how to sell energy efficiently, facilitated by Mark Jewell of Selling Energy, which took place on April 24-25, 2017;
- The Smart Energy Event, an ENS-sponsored conference which took place in Halifax on April 25-26, 2017;
- Passive House Canada's Building Enclosures for High Performance Buildings training, sponsored by ENS, on October 4, 2017; and
- ENS's Bright Business Conference which took place on October 17, 2017; and
- Energy Efficiency Opportunities in Industrial Refrigeration Systems, a training course hosted by ENS on November 27, 2017.

ENS also fostered the introduction of the Passive House concept in Nova Scotia and promoted new home building standards throughout 2017.

In 2017, ENS developed a video for Housing Nova Scotia highlighting a Housing Nova Scotia project demonstrating Passive House principles. This video was released in 2017 and is featured on the ENS website.

Working with Governments

ENS seeks to drive market transformation by working with governments to promote the adoption of energy-efficiency measures by implementing codes and standards.

In 2017, ENS continued to support the development of national energy-efficiency standards by:

- evaluating the impacts of code and regulation changes annually;
- participating in and funding the Canadian Standards Association's Steering Committee on Performance Energy Efficiency and Renewables (SCOPEER) and the Strategic Resource Task Force (SRTF) committee;[24]
- continuing to work with NRCan and the NS Department of Energy in reviewing and providing feedback on market transformation initiative for key technologies relating to Canada's Pan-Canadian Framework on Clean Growth and Climate Change;[25]
- attending the Standards Council of Canada's (CSA) Annual General Meeting; and
- assisting the national and provincial governments with codes and standards-related activities.

These activities are intended to:

- improve the efficiency of electricity-consuming devices and equipment through either voluntary manufacturer adoption or regulation; and
- develop and advance codes and standards in provincial and national energy-efficiency regulations and policies.

In addition, ENS worked with its Evaluation Consultant to plan the 2017 evaluation of codes and standards. The 2017 Codes and Standards Evaluation report quantifies impacts within Nova Scotia's market, due to both federal and provincial code and regulation changes and additions. This evaluation included the Nova-Scotian impact of two products included in Amendment 13 to Canada's *Energy Efficiency Regulations,* namely residential clothes washers and residential refrigerators.[26]

[24] The STRF funds the development of standards by SCOPEER, while SCOPEER oversees the development of Canadian energy efficiency standards.
[25] This work is funded through ENS's Enabling Strategies investment from the DSM fund (like other Codes and Standards related activities) and is expected to be ongoing over the next several years, given the number and scope of initiatives arising from the framework.
[26] Natural Resources Canada, *Notice – Publication of Energy Efficiency Regulation, 2016- Amendment 13*, December 2016, available at <http://www.nrcan.gc.ca/energy/regulations-codes-standards/18419> (Last accessed February 28, 2017).

Regulatory Affairs

Regulatory Affairs activities enable ENS to meet its regulatory requirements and provide a fair and transparent process for stakeholders and Nova Scotians to offer input into DSM Resource Plans, programs, and investments.

In 2017, Regulatory Affairs activities included:

- engaging with regulatory stakeholders, the DSM Advisory Group and consultants, as appropriate, on topics including:
  - the development approach for the 2019 DSM Resource Plan;
  - quantifying non-energy benefits for cost-effectiveness testing purposes (see section 5.3 for more information);
  - finalizing and implementing the Incentive Setting Methodology Study (see section 5.4 for more information);
  - gaining UARB approval of EfficiencyOne's Affiliate Code of Conduct;
  - refining the historical Rate and Bill Impact Analysis methodology;
  - developing a Locational DSM report, in collaboration with NS Power;
  - the provision of customer electricity data from NS Power; and
  - ENS's 2017 historical Rate and Bill Impact Analysis.
- developing quarterly and annual UARB reports;
- holding DSM Advisory Group meetings and technical sessions;
- filing and answering Information Requests on EfficiencyOne's 2016 Audited Financial Statements;
- addressing evaluation and verification recommendations;
- coordinating the Evaluation Consultant's and Verification Consultant's site visits and facilitating the evaluation and verification processes;
- conducting a Cost Containment Audit;
- conducting an Internal Audit of Program Internal Controls – Instant Savings;[27]

[27] M08011, *EfficiencyOne 2016 Audited Financial Statements*, [EfficiencyOne Response to Information Requests], [7 June 2017], at response to IR-01.

- conducting a Procurement Process Internal Audit;[28] and
- developing an eTRM.

Further to a direction from the UARB, ENS finalized a loan arrangement on February 1, 2017 with Toronto Dominion (TD) in the amount of the accrued return earned by NS Power on the 2015 DSM Deferral. ENS advanced this sum to NS Power and entered into an Undertaking to Pay with NS Power, whereby NS Power is obligated to make equal monthly payments that correspond in amount and timing to those that ENS is obligated to make to TD. These efforts are expected to save ratepayers approximately $6 million.

For more information on Regulatory Affairs activities, please refer to section 5 on Deferred Items from the 2016-2018 DSM Resource Plan regulatory process, below.

[28] *Ibid.*

2 HST UPDATE

Effective January 1, 2015, all assets, liabilities, and fund balances of Efficiency Nova Scotia Corporation (ENSC, subsequently renamed by legislation to ENS Transition Corporation), with the exception of the DSM HST Receivable, were vested by legislation in EfficiencyOne as the first franchise holder. The DSM HST Receivable remains as an asset of ENS Transition Corporation (ENSTC).

On February 25, 2015, ENSTC received a Notice of Confirmation from the Canada Revenue Agency (CRA) Appeals Division. The notice stated that the CRA had reviewed the position taken by the CRA Audit Division and considered the additional information provided by ENSTC. It then confirmed the original ruling set out by the CRA Audit Division; CRA remains of the position that ENSC did not make a taxable supply to NS Power, and was therefore ineligible to claim Input Tax Credits.

Pursuant to section 306 of the Excise Tax Act,[29] in May 2015, ENSTC filed a Notice of Appeal with the Tax Court of Canada to have the CRA Appeals Division decision overturned. ENSTC remains of the view that a taxable supply was provided by delivering DSM programs and that it was entitled to claim full Input Tax Credits. Therefore, the HST receivable will remain as an asset with ENSTC until the Tax Court of Canada rules on the matter.

Discovery examination of ENSTC's nominee was conducted on July 6, 2017 and discovery of CRA's nominees were conducted on July 7, 2017 and November 9, 2017. Undertakings from discovery were satisfied on March 2, 2018 by both parties (ENSTC and CRA). A settlement conference has been scheduled for April 6, 2018. A hearing date may be set pending the outcome of the settlement discussions.

[29] See *Excise Tax Act,* RSC 1985, c E-15 s 306.

3 2018 PLANNED ACTIVITIES

In 2018, ENS will continue to build on its previous successes and contribute to fostering an energy efficient culture in Nova Scotia. By the end of 2018, ENS expects to meet the UARB-approved 2016-2018 DSM net incremental energy and net peak demand savings targets (at the generator) of 405.9 GWh and 62.5 MW, within the UARB-approved investment amount of $102.2 million.[30] ENS will provide its mid-course adjustments for 2018 by program and their customer rate class impacts within its 2018 Q1 DSM Report, due to be filed in May, 2018.

In 2018, ENS will work with its Evaluation Consultant to design evaluations that will provide accurate results, keep to allocated evaluation budgets, and identify opportunities for continuous improvement. ENS plans to continue conducting condensed evaluations for some program components in recognition of having reached a maturity level where key savings parameters have remained stable for several years. ENS and its Evaluation Consultant will review the results of the 2017 evaluations and tailor 2018 evaluation activities accordingly; ENS will only reduce activities where any potential risks can be reasonably minimized.

ENS will also continue to work with its Evaluation Consultant to plan a program support process evaluation that will provide ENS with insights and recommendations for improvement that will help maximize ENS's impact in Nova Scotia.

To facilitate another successful year, ENS will continue its lean process improvement initiative, which will map out the participant process and streamline it where appropriate to improve the participant experience. A "lean" culture focuses on continuous improvement and analysis of the flow of services, products, and information to reduce waste and increase efficiencies. This is an ongoing process improvement approach that ENS will continue pursuing organization-wide throughout 2018.

[30] *Supra* note 1.

3.1 Residential Programs and Services

The 2018 Residential sector consists of the following programs:

- Efficient Product Rebates;
- Existing Residential; and
- New Residential.

3.1.1 Efficient Product Rebates

The EPR program consists of the following components:

- Instant Savings; and
- Appliance Retirement.

Instant Savings

Following the 2017 pilot introduction of the "Indoor Air Quality" category, ENS will continue offering rebates during the spring and fall 2018 campaigns for dehumidifiers and air purifiers, along with the existing Instant Savings measures; consideration of year-round rebates for these new measures will be explored with participating retailers. Rebates will no longer be offered in 2018 for kitchen range-hoods or bathroom fans due to low retailer and consumer uptake during the pilot in the fall 2017 Instant Savings campaign.

A number of marketing initiatives for Residential EPR are planned during 2018 including media and in-store advertising for the spring and fall Instant Savings campaigns, digital marketing, and EPR highlights in ENS's *The Switch* Residential newsletter.

Appliance Retirement

In 2018, ENS will focus on generating Appliance Retirement energy savings by continuing to offer the existing retirement and replacement services, and opportunities

to deliver new initiatives. ENS will continue to work with the Halifax Regional School Board (HRSB) to retire inefficient fridges and freezers from HRSB schools and school board offices.

2018 will also see the launch of a new ENS online booking portal for Appliance Retirement, designed to improve the user experience and streamline the pick-up booking process.

Planned marketing activities include direct mail, media campaigns and in-store promotion of Appliance Retirement.

3.1.2 Existing Residential

ENS's 2018 Existing Residential program comprises the following program components:

- Home Energy Assessment;
- Green Heat;
- Efficient Product Installation; and
- First Nations Home Energy Efficiency pilot.

These components provide services that are focused on whole-home (including building envelope) retrofits, the direct installation of low-cost energy-efficient technologies, and rebates for the installation of select energy-efficient technologies.

Home Energy Assessment

HEA is a well-established and successful whole-home energy-efficiency program component. In 2018, assessments and incentives will continue to be provided for all components of a home's building envelope, space-heating equipment, and water-heating equipment. Administrative and program management processes focus on reducing barriers to make HEA easier to understand and participate in, and more straightforward to deliver. HEA will complete a review of its incentive structure and

rebate guide in 2018, with the objective of making HEA and its incentives more user-friendly.

ENS will work to increase awareness of, and participation in the EnerGuide Real Estate Listing pilot in 2018, which gives homeowners the option to have EnerGuide information included with their home listing on the ViewPoint.ca real estate website.

Green Heat

Green Heat will continue its focus on ductless MSHPs in 2018; ductless MSHPs accounted for 87 percent of the measures installed through Green Heat in 2017 and ENS expects this momentum to continue in 2018. Green Heat will also continue to incent the adoption of hybrid heat-pump water heaters as well as wood and pellet stoves, among other measures in 2018. In addition, Green Heat will explore opportunities to add new measures to its offerings.

Marketing initiatives in 2018 will include increased signage at retail locations as well as engagement with contractors and manufacturers to further increase awareness and understanding of Green Heat, its new rebate structure, and the incentives available.

Efficient Product Installation

ENS will continue to offer direct installation services to homeowners, renters, and landlords in 2018 and will continue to develop strategies to achieve more savings per household, as well as continue to research other potential measures that could be offered.

EPI will be piloting a new measure, thermostatic shower valves, in 2018 for participants with electrically-heated hot water. This is a water saving device that is designed to reduce hot water and energy waste by shortening the time that hot water is left running

before the user steps into the shower. In addition, LED holiday lights will be offered again as a pilot measure in November and December of 2018.

ENS will also engage in a variety of EPI marketing initiatives throughout 2018 utilizing digital and social media platforms, as well as print advertising, direct mail, and features in ENS's *The Switch* Residential newsletter.

First Nations Home Energy Efficiency Pilot

In 2018, ENS will use DSM funds to support a new First Nations Home Energy Efficiency pilot program that is primarily funded by the Province of Nova Scotia. The DSM-funded portion of the pilot will seek to deliver significant electrical energy savings to on-reserve, Band-owned homes, where the household is income-qualified.

Currently, Band-owned homes are not eligible for the HomeWarming service, due to home-ownership requirements. DSM funds will be used to conduct energy assessments and complete energy-efficiency upgrades for approximately 35 electrically heated homes, focusing on building envelope and/or heating system upgrades. The pilot will be offered in all 13 First Nations communities across the Province, with priority being given to the upgrades that result in the most significant energy savings. DSM funds will also be made available for electrical appliance replacements in non-electrically heated homes, similar to the approach taken by the HomeWarming service. ENS expects that most homes participating in the pilot will receive upgrades in 2018, with some being completed in early 2019.

3.1.3 New Residential

In 2018, ENS will continue to work closely with the exiting NHC Service Provider to assist in the completion of the Service Provider's remaining projects. Also, the NHC Passive House pilot will continue, with a number of project completions anticipated in early 2018.

NHC will continue building relationships and further engaging with builders and contractors across the province to increase awareness of and participation in NHC. Marketing activities planned for 2018 include: promotion through a variety of media platforms; attendance at trade-shows and other events; a NHC-specific marketing campaign; and the development of case-studies that profile participants.

3.2 Business, Non-Profit and Institutional Programs and Services

In 2018, the BNI sector will consist of the following programs:

- Efficient Product Rebates;
- Custom Incentives; and
- Direct Installation.

In 2018, ENS will continue its efforts to encourage businesses, non-profits, and institutions to incorporate energy-efficient decisions into their activities. The OEM initiative, which helps identify projects for Custom and other BNI offerings, will continue in 2018. As in previous years, this program will seek to recruit new participants in a continued effort to develop energy management plans and facilitate participation in ENS programs.

BNI marketing efforts in 2018 will be aimed towards the following priority participant groups:

- Industrial;
- Agriculture;
- Small Businesses;
- Commercial Buildings;
- Hospitality; and
- Municipalities.

Marketing efforts spanning the BNI sector in 2018 are focused on non-energy benefits to demonstrate the good things efficiency brings to Nova Scotian businesses and include the following elements:

- integrated marketing campaigns across a variety of media such as print, direct mail, digital and social media, and events and outreach;
- improvements to navigational tools on the ENS website;
- the development and sharing of BNI success stories; and
- education and outreach with key industry associations through partnerships, sponsorships, and event participation.

3.2.1 Efficient Product Rebates

ENS will continue to monitor the impacts of the process improvement initiative that took place for BER in 2017 and will make adjustments as necessary during 2018. In addition, BER rebates will continue to be refined and expanded upon where appropriate. New rebates that will be targeted include expanded lighting and heating options.

Marketing efforts include those listed in section 3.2 above, as well as the hosting of small-business education events along with outreach with the ETN and contractors.

3.2.2 Custom Incentives

The Custom Incentives program comprises the following components:

- Custom;
- Energy Management Information Systems (EMIS); and
- Strategic Energy Management (SEM).

In 2017, Custom Incentives will continue to support innovative projects that do not qualify for other programs.

Custom

Custom comprises three separate services: Retrofit; Building Optimization; and New Construction. ENS will explore opportunities for improvements to these services in 2018, such as reviewing incentive amounts and energy-planning support. ENS will also look at ways to enhance its Service Provider listings. 2018 will also see the continuation of five pilots that began in 2017, detailed further in section 1.3.2.

Marketing will include the strategies noted in section 3.2 above, as well as the development of a technical series to promote energy-efficient trends and new technologies to potential participants.

Energy Management Information Systems

During 2018, ENS will continue to support existing EMIS participants in the expansion of their energy management information systems and will continue efforts to recruit new participants. ENS will also review current participants' operational controls and expand their opportunity for savings through additional controls, identification of new savings opportunities, and refinement of existing actions.

In addition, ENS will investigate the potential to offer a more flexible energy management approach encompassing elements of both EMIS and SEM to facilitate the varying needs of participants. ENS intends to pilot this approach in a limited capacity in 2018.

ENS will undertake work on a further EMIS pilot in 2018, involving the installation of fault detection and diagnosis software designed to further optimize the host facility's operating conditions.

Strategic Energy Management

In 2018, ENS is introducing a flexible approach for SEM participants, in contrast to the cohort model previously used. This change is based on participant feedback and is being implemented to accommodate individual participants' needs and improve accessibility, as well as aiming to increase SEM's participation rates. Participants will enroll in SEM on an individual basis and work one-on-one with the Service Provider, as well as participate in group training events with other SEM participants throughout the year, regardless of their stage in the program component.

3.2.3 Direct Installation

Throughout 2018, the Direct Installation program, marketed as Small Business Energy Solutions (SBES), will continue to provide small businesses in Nova Scotia with access to qualified contractors and to incent small business to complete energy-efficient upgrades in an effort to make them more viable and competitive. The program will also continue to enable participants to find contractors through the ETN or to use a contractor of their choosing. In addition, ENS will add a navigation tool to its website as well as implement additional process improvements to enhance and simplify the participant experience and reduce the cycle time for processing applications.

Throughout the year, SBES will continue to expand support for non-lighting measures, emerging technologies, and vertical market specialties. To encourage greater participation, SBES will place a high priority on contractor and participant outreach in 2018 by attending contractor trade shows and events and providing continued support for the ETN, along with the additional BNI marketing efforts detailed in section 3.2. In addition to this outreach, ENS staff will continue exploring options to educate small businesses on SBES and to promote the offering by facilitating information and education sessions in partnership with key stakeholders.

The SBES Multifamily Housing Pilot will focus on continuing to support existing participants in the implementation of energy-efficient upgrades recommended in the primary audit portion of the pilot.

3.3 Enabling Strategies

Enabling Strategies will remain an important priority at ENS in 2018 and will include the following categories:

- Education and Outreach;
- Development and Research; and
- Other Enabling Strategies:
  - PACE Financing;
  - Capacity Building;
  - Working with Governments; and
  - Regulatory Affairs.

3.3.1 Education and Outreach

Education and Outreach strategies for 2018 will continue to create awareness and provide information about energy efficiency to stakeholders and Nova Scotians at presentations, speeches, and other events. These activities will include:

- continuing to engage Nova Scotians through social media (Facebook, Twitter, YouTube, LinkedIn, and Instagram) to drive awareness and create a culture of energy efficiency;
- distribution of electronic newsletters;
- advertising via a variety of media to increase awareness and understanding of the programs and services ENS offers, with the objective of increasing participation in them;
- continuing to build the Green Schools program by increasing awareness of, and building energy efficiency into, the P-12 curriculum;
- working with post-secondary institutions to deliver energy efficiency courses;

- attending public speaking engagements and presentations on energy efficiency, as well as attending community events, home shows and trade shows;
- developing and monitoring energy-efficiency media stories; and
- working with delivery agents, industry partners and educational institutions to develop, manage, and deliver education and outreach programs.

3.3.2 Development and Research

Key development and research activities planned for 2018 include:

- tracking quality assurance and participant satisfaction;
- tracking other attitudinal metrics among the general population of Nova Scotia households to help ENS respond to changing market conditions; and
- profiling business segments and exploring the potential to update residential profile segments.

3.3.3 Other Enabling Strategies

In 2018, ENS's Other Enabling Strategies will focus on:

- PACE Financing;
- Capacity Building;
- Working with Governments; and
- Regulatory Affairs.

PACE Financing

Throughout 2018, ENS will continue to support financing initiatives within its Residential programs. To further these initiatives, ENS will continue to support municipalities participating in PACE, and anticipates exploring and implementing PACE programs in more Nova-Scotian municipalities. Although this initiative occurs outside of ratepayer-funded activities, it enables participation in DSM programs by providing participants with an additional financing option.

Capacity Building

In 2018, ENS intends to procure and train additional Quality Assurance Site Inspectors to collect Delivery Agent performance information pertaining to the residential Efficient Product Installation program component. ENS will also continue to monitor the performance of existing Service Providers by attending site inspections to identify opportunities for continuous improvement and process optimization. In addition, ENS will continue to work collaboratively across programs and departments to schedule site inspections and limit the number of times participants are contacted following program participation.

Throughout 2018, ENS will continue to support and grow the energy-efficiency industry in Nova Scotia and build on the successes of the ETN by:

- continuing the successful theme of 'The Good Things Efficiency Brings' at ENS's annual Bright Business Conference & Awards in 2018, with sessions tailored for ETN members and focusing on the non-energy benefits of energy efficiency;
- coordinating ETN member discounts for training courses, workshops, and conferences offered by industry partners, including the Smart Energy Event, Passive House Canada Certification, and the Certified Energy Manager course from the Canadian Institute for Energy Training (CIET);
- continuing to provide communications to ETN members through ENS's *The Network News* bi-monthly newsletter;
- providing advance notice of upcoming EfficiencyOne procurement opportunities on the EfficiencyOne website and in ENS's *The Network News*;
- hosting training and information sessions (e.g. webinars, in-person events, and pre-recorded videos) for ETN members on topics including EfficiencyOne's Procurement process as well as ENS program offerings and program changes (e.g., incentive changes or application process changes);
- hosting a networking event for ETN members to provide information on how they can work with ENS Business Development Managers to increase uptake in the (Commercial) New Construction service;

- working to increase membership uptake within key sectors and industries, including agriculture, new home construction, and refrigeration technicians; and
- creating marketing guidelines for members and assisting them in accurately referencing ENS services in their business marketing materials.

Working with Governments

ENS seeks to drive market transformation by working with governments to promote the adoption of energy-efficiency measures through government initiatives, including implementing codes and standards.

In 2018, ENS plans to continue supporting the CSA's SRTF and SCOPEER committees. Specifically, ENS intends to support the development of national energy-efficiency standards in the following technology areas:

- retrofit commissioning of commercial and industrial buildings;
- development of a thermal bridging methodology for assistance in code development and enforcement; and
- Variable Capacity Heat Pumps.

ENS will also work with its Evaluation Consultant again in 2018 to establish an appropriate scope for the Codes and Standards evaluation.

Regulatory Affairs

Regulatory Affairs activities will include reporting to the UARB and stakeholders on ENS topics, including:

- the 2019 DSM Resource Plan;
- the development of the 2020-2022 DSM Resource Plan;
- quarterly reports;
- audited financial statements;
- locational DSM efforts, in collaboration with NS Power;

- the 2018 Historical Rate and Bill Impact Analysis;
- quantification of non-energy benefits for cost-effectiveness testing purposes; and
- addressing evaluation and verification recommendations.

In the first quarter of 2018, ENS consulted with DSM Advisory Group stakeholders to develop the 2019 DSM Plan, which is filed concurrently with this APR. This was developed based on a continuation approach, in accordance with the *Electricity Efficiency and Conservation Restructuring (2014) Act*.

Throughout 2018, ENS will continue to work closely with the DSM Advisory Group and individual stakeholders to discuss these initiatives, as appropriate. Other projects will include working with the Evaluation and Verification Consultants to facilitate their efforts and continuing to support the development of the new DDSM data tracking system.

4 PLANNED AND ACTUAL DSM EXPENDITURES

The October 7, 2015 UARB Order directed NS Power to file its proposed accounting treatment and cost recovery for the 2015 DSM programs and the 2016-2018 programs.[31] To aid in such cost recovery calculations, ENS will continue to report on planned and actual DSM expenditures by rate class. Table 11, Table 12 and Table 13 present 2015, 2016, and 2017 planned and actual[32] DSM expenditures, and Table 14 presents 2018 planned DSM expenditures.

Table 11: 2015 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2015 Expenditures ($ million)	Actual 2015 Expenditures ($ million)
Residential/Charitable (2,3,4)	21.0	16.6
Small General (10)	2.4	1.1
General Demand (11)	10.1	8.8
Large General (12)	1.9	0.9
Small Industrial (21)	0.9	1.0
Medium Industrial (22)	0.9	1.1
Large Industrial (23, 25)	0.8	1.7
Municipal (24)	0.7	0.9
Unmetered (999)	0.3	0.0
Total	**39.0**	**32.0**

Numbers may not sum due to rounding.

[31] *Supra* note 1 at p 2, item 8.
[32] 2017 expenditures are unaudited.

Table 12: 2016 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2016 Expenditures ($ million)	Actual 2016 Expenditures ($ million)
Residential/Charitable (2,3,4)	16.6	16.8
Small General (10)	1.3	1.0
General Demand (11)	8.7	8.2
Large General (12)	1.8	1.0
Small Industrial (21)	0.9	1.1
Medium Industrial (22)	1.0	0.9
Large Industrial (23, 25)	2.1	1.1
Municipal (24)	0.7	0.8
Unmetered (999)	0.0	0.0
Total	**33.2**	**30.8**

Numbers may not sum due to rounding.

Table 13: 2017 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2017 Expenditures* ($ million)	Actual 2017 Expenditures ($ million)
Residential/Charitable (2,3,4)	17.5	14.8
Small General (10)	1.1	0.9
General Demand (11)	10.1	9.0
Large General (12)	1.1	1.3
Small Industrial (21)	1.2	1.1
Medium Industrial (22)	1.2	0.9
Large Industrial (23, 25)	1.7	1.3
Municipal (24)	0.7	1.0
Unmetered (999)	0.0	0.0
Total	**34.6**	**30.3**

Numbers may not sum due to rounding. Expenditure amounts are unaudited.
* "Planned 2017 Expenditures" refers to the planned annual mid-course adjusted amount.

Table 14: 2018 Planned DSM Expenditures by Rate Class

Rate Code	Planned 2018 Expenditures ($ million)
Residential/Charitable (2,3,4)	19.4
Small General (10)	1.5
General Demand (11)	8.3
Large General (12)	1.7
Small Industrial (21)	0.7
Medium Industrial (22)	1.0
Large Industrial (23, 25)	1.6
Municipal (24)	0.6
Unmetered (999)	0.2
Total	**34.9**

Numbers may not sum due to rounding.

5 UPDATES ON ITEMS ARISING FROM THE 2016-2018 REGULATORY PROCESS

Throughout the 2016-2018 DSM Resource Plan regulatory process, various items arose from or were deferred under the UARB Order,[33] the UARB-approved 2016-2018 DSM Plan Consensus Agreement (Consensus Agreement),[34] and the 2016-2018 Quantum Agreement.[35] The statuses of the items that remained open in 2017 are discussed below.

5.1 Locational DSM Efforts

In accordance with the UARB's direction in its Order dated October 17, 2015, ENS and NS Power filed a collaborative report on locational DSM efforts (i.e., geotargeting), on 23 December 2016.[36] Further to the UARB's letter of January 6, 2017, ENS and NS Power filed a further report on August 14, 2017. In the report, it was noted that while NS Power and ENS could not come to an agreement on the appropriate methodology to assess locational DSM, they would do the following:[37]

- NS Power would conduct a detailed review of capital expenditures that could potentially be avoided through locational DSM and convey the results to ENS; and

[33] *Supra* note 1.
[34] *Ibid* at Schedule B.
[35] M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix C; the Quantum Agreement was signed by representatives of EfficiencyOne, the Consumer Advocate, the Small Business Advocate, the Affordable Energy Coalition, and the Ecology Action Centre. Although the Quantum Agreement was not approved by the UARB, the UARB Decision indicated its understanding that "the non-financial provisions of the Quantum Agreement will be pursued by E1, NSPI and other stakeholders through the DSM Advisory Group" (*Ibid* at para 27). As such, ENS is addressing these items alongside the other items that arose from the 2016-2018 Regulatory process.
[36] See M06733, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities,* [2016 Locational DSM Report], [23 Dec 2016].
[37] See M07815, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities* [2017 Locational DSM Report], [14 Aug 2017] at p. 37.

- NS Power and ENS would evaluate the costs and benefits of locational DSM and other types of DSM including those of system-wide peak reduction programs.

The UARB requested an update to be filed by June 30, 2018 regarding these outstanding issues. ENS looks forward to continued collaboration with NS Power on locational DSM efforts.

5.2 Historical Rate and Bill Impact Analysis

In the Consensus Agreement, ENS agreed to develop, in consultation with the DSM Advisory Group, assumptions for its Rate and Bill Impact Analysis (RBIA), and did so prior to filing its 2016 RBIA.[38] In response to Stakeholder comments regarding its 2016 RBIA, ENS filed a list of suggested actions for development throughout 2017. Proposed solutions were brought to the DSM Advisory Group meeting on June 28, 2017, and ENS filed its 2017 RBIA with the UARB on October 31, 2017. In response to stakeholder comments, ENS committed to work with NS Power and the DSM Advisory Group throughout 2018 to explore a number of items relating to the methodology and assumptions used in the analysis. As noted in the Consensus Agreement, ENS will file its 2018 RBIA by October 31, 2018.[39]

5.3 Cost-Effectiveness Testing

In the 2016-2018 Quantum Agreement, the DSMAG agreed to work to achieve consensus as to the methodology and assumptions of the cost- effectiveness screening test to be applied to future DSM Resource Plans.[40] In ENS's July 22, 2016 Settlement Agreement on the outstanding items from the 2016-2018 DSM Resource Plan regulatory process, stakeholders agreed to "work collaboratively with the DSM Advisory Group to

[38] *Supra* note 1 at Schedule B, item 6(a).
[39] *Ibid* at Schedule B, item 6(b).
[40] *Supra* note 35 at s. 7.

pursue the nature and quantification of estimates associated with participant non-energy benefits to improve the TRC test in future Applications."[41]

Further to this Settlement Agreement, ENS hosted a DSM Advisory Group technical symposium in 2016 to discuss the general approach to quantify non-energy benefits within the Nova-Scotian TRC test. ENS then drafted a resulting Scope of Work, which was informed by feedback received from the DSM Advisory Group and circulated for further comment. This revised Scope of Work was provided to the DSM Advisory Group on January 31, 2017 and following that, Vermont Energy Investment Corporation (VEIC) was procured by ENS to undertake a study into measure-level non-energy benefits.

The purpose of this study is to identify the most comprehensive and defensible non-energy benefit values available in existing research and provide recommendations on adapting them, at the measure level, to ENS's energy-efficiency portfolio. The draft report was presented to the DSMAG and members' comments and feedback were taken into account in a revised draft in December 2017. ENS intends to hold further discussions with the DSM Advisory Group in 2018 in relation to ENS's plans for integrating non-energy benefits into the TRC test in Nova Scotia.

5.4 Incentive Setting Methodology Study and Implementation

In response to the UARB's Order dated October 7, 2015,[42] ENS initiated research to develop a more rigorous approach and methodology for setting incentive levels. This research included gathering information on how 12 North American jurisdictions set, review, and revise incentives for DSM programs as well as reviewing ENS's current

[41] See M06733, *The Public Utilities Act, RSNS, 1989, c 380 and the order of the Nova Scotia Utility and Review Board in Matter M06733 directing the parties to pursue resolution of certain matters set out in settlement agreements therein within the DSM Advisory Group and The Application of EfficiencyOne for approval of the matters agreed upon within the DSM Advisory Group and for determination of unresolved issues* [Settlement Agreement], [22 July 2016], item 7(a).
[42] *Supra* note 1.

practices and recommending changes to these practices. This study, conducted by CLEAResult, was completed and a report filed with the UARB on June 30, 2016, alongside an Implementation Plan drafted by ENS. Pursuant to the UARB's letter dated November 18, 2016, ENS filed an amended Incentive Setting Methodology report and revised Implementation Plan with the UARB on May 11, 2017, which were subsequently accepted as filed with the UARB on July 18, 2017.

During 2017, ENS developed a two-year market research plan (2017-2018), in accordance with the Incentive Setting Methodology report. The research initiated in 2017 will be completed in early 2018. Findings from this research will be used to further inform the 2018 research conducted by ENS. In accordance with CLEAResult's Incentive Setting Methodology report, ENS also began implementing the new incentive setting methodology. This methodology, which includes screening incentive levels against the thresholds recommended by CLEAResult, now applies to any new measure being added to the ENS portfolio and when incentives to existing measures are being modified. A review of existing incentives is also conducted on a periodic basis, as per CLEAResult's recommendations. The incentive setting and review process uses a Consolidated Calculator, which was developed by ENS further to recommendations from CLEAResult.

ENS also performed a financial simulation for all measures in 2017, per CLEAResult's recommendation. This simulation examined incentive levels relative to Program Administrator cost-effectiveness test results and incremental costs, among other metrics.

Finally, the Evaluation Consultant reviewed ENS's progress implementing the incentive setting methodology. This evaluation is filed as part of the 2017 Evaluation Report. ENS intends to use the findings from this evaluation to further refine its processes for setting and reviewing incentives.

5.5 Update on Evaluation and Verification Recommendations

An update on the status of evaluation and verification recommendations is set out in Attachment A.

6 CONCLUSION

ENS is pleased to submit this Annual Progress Report on its 2017 DSM performance. As of this writing, ENS expects to meet its 2018 planned savings, while continuing to provide DSM programs and services that meet a wide variety of participants' needs. ENS looks forward to the opportunity to respond to questions on this report and to continue updating the UARB and stakeholders on its progress throughout the remainder of the year.

ATTACHMENT 1

EVALUATOR AND VERIFIER RECOMMENDATION UPDATES

Table 1: Update on Implementation of 2013-2015 Evaluation Recommendations

Table 2: Update on Implementation of 2013-2015 Verification Recommendations

Table 3: Update on Implementation of 2016 Evaluation Recommendations

Table 4: Update on Implementation of 2016 Verification Recommendations

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Evaluation	**Continue to work on including as much information as possible in standardized database format**: In 2013, more information was available on the DSMDS in the form of automated reports. In order to facilitate savings tracking and future evaluation activities, ENSC should continue to work on including all necessary information in the DSMDS in the form of standardized entries. This includes technical specifications of equipment, answers to pre-screening questions and savings equations.	OV-R6	In Progress	ENS agrees with this recommendation and continued implementing its new Dynamic DSM data tracking system (Dynamic DSM) in 2017. This system will improve customer experience and create efficiencies for program delivery through improved and standardized tracking and reporting processes. In 2017, ENS fully integrated three program components into the Dynamic DSM and will integrate others in 2018.	2019
2013	Evaluation	**Evaluate the benefits/costs in acquiring a Customer Relations Management (CRM)**: This type of system could be a key tool for ensuring effective data collection (customer, loyalty, segmentation, benchmarking/competitive, etc.) and evidence-based decision-making.	TPE-R3	In Progress	ENS agrees with this recommendation. The CRM tool is a key component of the Dynamic DSM. In 2017, ENS fully integrated three program components into the Dynamic DSM and will integrate others in 2018.	2019
2013	Evaluation	**Adapt the tracking system (DSMDS) to the QA program**: A QA program was implemented in 2013 by ENSC and will become more mature in 2014. This continuous process will involve reviewing a sample of files, particularly targeting projects with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and therefore recommends that the results of these reviews be tracked in the DSMDS.	HEA-R4	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year
2013	Evaluation	**Adapt the next tracking system (DSMDS) to the QA program**: A QA program will be fully implemented by ENSC in 2014. This continuous process will involve reviewing a sample of files of HOT2000 simulation results compared with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and recommends that these review results be tracked in the DSMDS. However, the Evaluator is aware that this process might take time to be perfectly implemented. In the meantime, ENSC can track the QA results on a separate spreadsheet using an identification number that allows merging the information easily with the tracking system. Moreover, the QA results should include the identification of the CEAs who conducted each assessment to provide more support or training to CEAs with less experience.	PP-R1	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Evaluation	**Consider adjusting the hours of operation used in the unitary savings calculations for lighting products in the upcoming years**: New studies that metered the hours of operation of residential lighting were found during this evaluation, but the Evaluator concluded that the hours of operation coming from the Hydro-Québec study should still be used for this year because of the similar market characteristics that the provinces of Quebec and Nova Scotia have. On the other hand, the Evaluator noted that the Hydro-Québec study only metered the hours of operation of CFLs. Certainly, it can be assumed that the CFLs installed first were installed in sockets that had the longest hours of operation to maximize the investment in more expensive bulbs. Yet, as the market evolves, the incandescent and halogen lamps to be replaced by CFLs or even LEDs will be lamps with lower hours of operation. Consequently, ENSC may have to consider adjusting the hours of operation for their savings calculations in the upcoming years. While a metering study in Nova Scotia would be the most accurate way of estimating operation hours, a more affordable option could be to use the DOE study and potentially adjust the number of sockets per household when using its findings.	MURB-R5	Complete	ENS agrees with this recommendation. The Evaluator completed its Residential Lighting Metering Study in 2017. It is included as an appendix to the 2017 Existing Residential evaluation report.	Complete
2014	Evaluation	**Adapt the tracking system (DSMDS) to the QA program**: A QA program was implemented in 2013 by ENSC and will become more mature in 2014. This continuous process will involve reviewing a sample of files, particularly targeting projects with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and therefore recommends that the results of these reviews be tracked in the DSMDS.	HEA-R4	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year
2014	Evaluation	**Perform thorough M&V and document it in a complete report for every large project for which thorough M&V work is justified and required.** The Evaluator has observed that ENSC is using M&V as a tool increasingly often each year for Custom Retrofit. For some simpler and smaller projects, performing some hours-of-operation data logging and spot measurement may be adequate to allow establishing savings with a fairly good level of accuracy and reliability. However, this year, the Evaluator encountered some very large projects with multiple energy efficiency measures, for which the M&V activities conducted were limited to a few spot measurements. The Evaluator considers that in order to justify incentives amounting to hundreds of thousands of dollars, a complete M&V report should be written to report on all the major elements defined in standard M&V protocols, such as the IPMVP. For smaller projects, a good practice would be to summarize the measurement methodology (what was measured and when) and the equations used to establish energy savings based on the raw data in a short form.	Custom-R1	Complete	ENS agrees with this recommendation. Standardized M&V processes and documentation were implemented as of January 1, 2018. ENS recognizes that more improvements may be required and will continue to monitor and assess for further improvements.	Complete

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2014	Evaluation	**Gather more data to conduct a conclusive calibration billing analysis in 2015.** Despite the fact that 23 projects were completed in 2012 and 2013, it was only possible to obtain sufficient energy billing data for seven projects to perform a calibration analysis in 2014. This calibration analysis proved to be inconclusive due to numerous factors. The Evaluator consequently suggests that this evaluation activity be continued in future evaluation. Other measures could be taken to ensure the quality of the result, such as requiring a final energy simulation submission (based on the as-built conditions), making enhanced building commissioning a mandatory element of Custom NC and/or including a full energy simulation review to ensure the accuracy of the model inputs.	Custom NC-R1	Deferred	ENS appreciates this recommendation. Peak demand savings are now collected from completed energy models. ENS expects to use Portfolio Manager as a tool for storing utility bill data. Currently, Portfolio Manager is not mandatory for NC participants, although most participants are open to using the tool. This will assist ENS in storing utility bill data until enough information is collected to conduct a future calibration billing analysis.	To be considered in a future year
2014	Evaluation	**Adapt the next tracking system (DSMDS) to the QA program**: A QA program will be fully implemented by ENSC in 2014. This continuous process will involve reviewing a sample of files of HOT2000 simulation results compared with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and recommends that these review results be tracked in the DSMDS. However, the Evaluator is aware that this process might take time to be perfectly implemented. In the meantime, ENSC can track the QA results on a separate spreadsheet using an identification number that allows merging the information easily with the tracking system. Moreover, the QA results should include the identification of the CEAs who conducted each assessment to provide more support or training to CEAs with less experience.	PP-R1	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year
2015	Evaluation	**Continue working towards the standardization of measurement and verification (M&V) procedures for Custom Retrofit.** ENS is currently developing tools to improve the quality of the M&V activities carried out for Custom Retrofit. The Evaluator believes that those efforts should be maintained, as the lack of consistency and the at times incomplete documentation of M&V are the main weaknesses of Custom Retrofit. In particular, the M&V strategy should be worked out with the participant and included in the Project Development Agreement (PDA), and all documentation relevant to the calculation of savings should be stored on the demand-side management data system (DSMDS).	Custom-R2	In Progress	ENS agrees with this recommendation. ENS has standardized its M&V policy. Documentation regarding calculation of savings is now stored on the Dynamic DSM. An updated PDA will be launched in 2018 that outlines the planned M&V activities.	2018
2015	Evaluation	**Improve the internal review procedure for savings calculations of both BER Mail-in and Instant Rebates.** In 2015, the Evaluator applied large adjustment ratios to the three most popular measure categories in BER Mail-in (HVAC, Lighting and LED Promotion), while LED linear fixtures and LED linear lamps were adjusted by over 50% in BER Instant Rebates because of data entry errors. These corrections appeared to be more significant than in previous years. The Evaluator noted that lighting projects in BER Mail-in required an especially higher number of corrections, for a number of reasons: (i) hours of operations were not representative of the facility's schedule; (ii) ballast factors were used inconsistently; and (iii) wattages did not match those on the specification sheets. It is strongly recommended that additional quality control steps be defined and implemented by the program manager to ensure that savings are calculated accurately upon project approval.	BER-R1	Complete	ENS agrees with this recommendation. ENS modified the participant forms/worksheets to collect additional HOU information from participants as requested by the Evaluator. New procedures have been established for baseline wattages in new construction projects and for the BER team to ensure they are including ballast factors as well as using the wattage table. These changes were also updated in the BER CIRx Screening Tool.	Complete

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2015	Evaluation	**Further improve the tracking system.** The Evaluator commends ENS for the significant improvements that have been made to the BER Mail-in and Instant Rebates tracking systems in the last two years. Nevertheless, some potential improvements were identified again this year. In BER Mail-in, it was found that the project's total savings were sometimes not linked to the individual measure savings. The Evaluator also noticed, in a few cases, discrepancies between the calculation algorithms, the variable descriptions and the savings calculated for the same measure. For BER Instant Rebates, the most significant potential improvement would be to update the evaluation category field to match the categories used in the 2015 evaluation.	BER-R2	In Progress	ENS agrees with this recommendation. Once transitioned to the Dynamic DSM, BER calculations will be standardized and consistent. In 2017, ENS fully integrated three program components into the Dynamic DSM and will integrate others in 2018. For BER Instant Rebates, each measure will be attached to a specific measure category that will match the most recent evaluation. ENS also completed additional training of staff to ensure the savings algorithms and variables were applied correctly for BER, performed a second review of completed BER mail-in projects, and updated the evaluation category in the BER tracking sheet for Instant Rebates.	2019

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Verification	**Efficiency Nova Scotia should take steps to carefully establish a Nova Scotia TRM.** This would facilitate both program planning and evaluation.	Savings Verification Recommendation No. 2	Complete	ENS agrees with this recommendation. ENS has completed the development of an electronic Technical Reference Manual. All measures for all programs have their calculations set up in the software that houses and executes all ENS savings calculations. All program components will be able to use the electronic Technical Reference Manual after they have been fully implemented in the Dynamic DSM.	Complete
2013	Verification	**Research Questions.** The next process evaluation should begin not at the level of official documents, the expectations of executive management and the mechanics of balanced scorecard and key performance indicators but with a practical and empirical perspective to answer questions, such as: "How and how well does this organization work in actual practice (considering the organization as the ENSC core plus all contractors and trade allies who together create and deliver the programs)? Where does it experience problems? What are the realities, pressures and benefits of work life for staff at different levels? Is there adequate challenge to individuals and is there adequate empowerment in scope of independent decision making and action for staff at all levels to both self-actualize and develop and, at the same time, to conscientious responsibility for service relationships with the people and institutions that ENSC serves? What are the restrictions on scope and to what extent are they needed or unnecessary? How and how well does ENSC maintain good faith and quality of service in the work done in customer homes and in businesses and industrial and institutional facilities? Are there any problems or unintended consequences or side effects in how this work is organized and carried out, and how might they be addressed? What are the informal realities experienced in work in the organization as well as the formal realities? Is the organization a good place to work? What might a new worker to the organization expect and are there career ladder possibilities? Is there also cynical knowledge in the organization and is there an experience of irony in some aspects of work? What do people who have left the organization think about it? Are there cases of underservice as well as good service? Why do cases of underservice occur – are they just products of contingencies or is anything patterned or built-in by organizational processes or requirements. Are there experiences of unanticipated side- effects, and how have programs be adapted to encounter these realities?	Process Evaluation SV-1	Complete	ENS agrees with this recommendation. Its Evaluator developed research questions for each of its process evaluations that focused on assessing how well ENS's processes are working in actual practice. The research questions are identified in each of the 2017 program support process evaluations. ENS plans to continue this approach to developing research questions in future process evaluations.	Complete
2013	Verification	**Boundary for Analysis.** The next process evaluation should draw the boundary for the study around ENSC plus its service delivery agencies and other extensions.	Process Evaluation SV-2	Complete	ENS agrees with this recommendation and has implemented it in the Marketing evaluation and Practices & Procedures evaluation. The Evaluator's methodology involved interviews with partners and participants where appropriate. They also reviewed best practices literature and in one case, interviewed other organizations similar to ENS. ENS will ensure all future process evaluations include partners outside the organization where applicable.	Complete

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Verification	**Inclusion.** Interviews and surveys should be inclusive of all staff levels, delivery agent staff and others who do the work.	Process Evaluation SV-4	Complete	ENS agrees with this recommendation and has implemented it in the Marketing evaluation and Practices & Procedures evaluation. The Evaluator's methodology involved interviews with ENS staff at all levels of management and interviews with partners and participants where appropriate. ENS will ensure all future process evaluations include interviews/surveys with all relevant groups involved.	Complete
2013	Verification	**Confidentiality.** Rather than focus groups, group settings or surveys which require personal identification, the evaluator should engage in dialog with individuals and guarantee confidentiality.	Process Evaluation SV-5	Complete	ENS agrees with this recommendation. The Evaluator conducted individual interviews with ENS staff and, in some cases, others outside the organization for its Marketing evaluation and Practices & Procedures evaluation. The Evaluator did not disclose respondent identity and will not disclose this information unless required by law.	Complete
2013	Verification	**Readability.** The next organizational level process evaluation should be written in a style that would be understandable to any resident of Nova Scotia without special training. In particular the model originally developed by the military for top-down strategic theater-level control of warfare and later transformed by Kaplan and others to nearly universal application to mission oriented businesses and non-profit organizations should be kept in the background since it is only the formal only part of the story. Special language like balanced scorecards and integration of key performance indicators for top down computer assisted reporting and control should be present as a dimension but minimized. The story of the organization and why it works and how it really works and how it provides real value and authentic service relationships should be told in everyday language and in a way that is inherently interesting and understandable.	Process Evaluation SV-6	Complete	ENS agrees with this recommendation and has implemented it in the Marketing evaluation and Practices & Procedures evaluation. ENS will ensure all future process evaluations have better readability for a wider audience.	Complete
2013	Verification	**Hours of Use Study.** The evaluator and ENSC should conduct a Nova Scotia hours of use study.	MURB SV-1	Complete	ENS agrees with this recommendation. The Evaluator completed its Residential Lighting Metering Study in 2017. It is included as an appendix to the 2017 Existing Residential evaluation report.	Complete
2014	Verification	**TRM.** Efficiency Nova Scotia should take steps to carefully establish a Nova Scotia TRM. This would facilitate both program planning and evaluation.	Savings Verification Recommendation No. 2	Complete	ENS agrees with this recommendation. ENS has completed the development of an electronic Technical Reference Manual. All measures for all programs have their calculations set up in the software that houses and executes all ENS savings calculations. All program components will be able to use the electronic Technical Reference Manual after they have been fully implemented in the Dynamic DSM.	Complete

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2014	Verification	**Develop evaluation guidelines.** A separate document from a TRM is a set of evaluation guidelines covering methods, practice and reporting. The New York evaluation guidelines and appendices could be reviewed and modified to form an initial document. This would set certain evaluation standards for future evaluations.	Savings Verification Recommendation No. 3	In Progress	ENS agrees with this recommendation and is developing evaluation guidelines to specify its approach and expectations for future evaluations.	2018
2014	Verification	**Savings Weighted Measure Lives.** The time dimension should be operationalized in the indicator system to supplement use of first year energy savings as a savings indicator. Programs differ in their time duration in providing kWh savings and demand reduction. Development of physical savings weighted measure lives for programs and program components and initiatives will provide a system for differentiating program efforts on this critical dimension and should be included in future impact evaluations. Keeping the first year energy savings as the sole performance criterion for assessing energy savings and demand reduction impacts makes standalone DSM behavioral programs appear equivalent to primarily technical and technical/regulatory DSM program. This mistake occurs as an artifact of the indicator system.	Savings Verification Recommendation No. 5	Complete	ENS agrees with this recommendation and began reporting lifetime energy savings for all of its program components in 2017. The Evaluator reviewed ENS's methodology through its evaluation work, presenting its results in the 2017 evaluation reports. The Evaluator used a multiple baseline approach where appropriate to determine lifetime energy savings.	Complete
2014	Verification	**Calibration for Custom New Construction.** Structure project monitoring to gather more data to conduct a conclusive calibration billing analysis in 2015 and develop the diversity factor used in peak demand savings by building it up from an individual measure basis.	Savings Verification Recommendation No. 17	Deferred	ENS appreciates this recommendation. Peak demand savings are now collected from completed energy models. ENS expects to use Portfolio Manager as a tool for storing utility bill data. Currently, Portfolio Manager is not mandatory for NC participants, although most participants are open to using the tool. This will assist ENS in storing utility bill data until enough information is collected to conduct a future calibration billing analysis.	To be considered in a future year
2015	Verification	**Savings Weighted Measure Lives.** The time and savings dimension should be operationalized in the indicator system to supplement use of first year energy savings as a savings indicator. Programs differ in their time duration in providing kWh savings and demand reduction. Development of physical savings weighted measure lives for programs and program components and initiatives will provide a system for differentiating program efforts on this critical dimension and should be included in future impact evaluations. Keeping the first year energy savings as the sole performance criterion for assessing energy savings and demand reduction impacts makes standalone DSM behavioral programs appear equivalent to primarily technical and technical/regulatory DSM programs. This occurs as an artifact of the indicator system.	SV-2	Complete	ENS agrees with this recommendation and began reporting lifetime energy savings for all of its program components in 2017. The Evaluator reviewed ENS's methodology through its evaluation work and the results are presented in the 2017 evaluation reports. The Evaluator used a multiple baseline approach where appropriate to determine lifetime energy savings.	Complete
2015	Verification	**Provide additional or reinforcement health and safety issue training, including mold problems and fiberglass precautions to all HEA field staff.**	SV-9 (HEA)	In Progress	ENS agrees with this recommendation. ENS will provide health and safety training with respect to building science and indoor air quality with a focus on moisture and mold to all service organizations at ENS's next in-house group seminar.	2018

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2015	Verification	**For Retail Direct Install, recommendation RDI-R1, include analysis of additional savings impacts and adoption practices for smart power controllers as they are used for gaming consoles.**	SV-13 (RDI)	Complete	ENS agrees with this recommendation. ENS received and reviewed the results of the California field study. Findings from the study showed that differentiated savings levels are not reliable, and use of a single savings value for all Tier 2 smart power controllers products is appropriate. Therefore, ENS will continue to use a single savings value for smart power controllers.	Complete
2015	Verification	**Maintain and enhance the EMIS savings by adopting SEM program elements with the EMIS technology.** For the EMIS program, multi-year evaluated savings increases for this technology can be expected based on continual improvements in facility savings due to increased information and control. Some studies show a continual increase in annual savings for several years. A follow up analysis of second and third-year facility savings, in absence of other program activities, should be performed on these projects and attributed to program savings through the 'milestone' achievements tab for the project. Follow up analysis should also address the level of ongoing support and commitment to SEM at the plant and company level.	SV-20 (EMIS)	In Progress	ENS agrees with this recommendation. The existing EMIS program component requires participants to not only install sub-metering infrastructure, but also to integrate the management of energy into an existing management processes, and draw on a lot of the organizational elements of SEM. EMIS incremental savings are evaluated on an annual basis for participants who continue to participate in the program component over a multi-year period. For SEM, ENS is currently working with a new service provider and will evaluate each participants' requirements for continued support beyond year one. ENS has engaged with past SEM participants, resulting in further interest in the EMIS program.	2018

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Start using the new method for calculating interactive effects associated with lighting projects. In 2016, the Evaluator improved the methodology used by ENS for calculating interactive effects and applied it to Business Energy Rebates, Custom, and Small Business Energy Solutions. It is recommended that this new methodology be applied in 2017.	OV-R1	Complete	ENS agrees with this recommendation and has implemented it for the BER, SBES, and Custom program components.	Complete
Continue to perform metering activity and keep improving its quality and effectiveness. This year, metering activity was focused on the small appliances retired since they were made eligible for the program component for the first time in 2016. However, the number of units metered was too small and the volume of data collected was not enough to support an impact evaluation. Another change made this year was the reintroduction of the "10 years old or older" eligibility criterion, after accepting only appliances of more than 15 years of age in 2015. Consequently, two types of appliances should be particularly targeted for metering in 2017, namely small appliances and full-size appliances with a more recent manufacture year class (in order to include appliances between 10 and 15 years of age). To help ensure that sufficient data is collected for the 2017 evaluation and improve metering data precision level, the Evaluator recommends planning the metering activity as early as possible in 2017. The Evaluator's visit to the recycling facility and analysis of the raw metering data revealed that the metering process can be improved by: › Using the raw data from the current transformer instead of the single final value from the plug-in meter to calculate energy consumption values. This will allow validating the proper functioning of the metering equipment since consistency in amperage can be verified over time. › Logging refrigerators' and freezers' internal temperatures throughout the metering process instead of recording the internal temperatures only at the beginning and the end of the metering period. › Establishing a calibration procedure for the data-logger and the plug-in meter, to be followed before the metering starts.	ARet-R1	Complete	ENS agrees with this recommendation and met all 2017 metering requirements. The metering protocol has been updated to include: using the current transformer results to calculate energy consumption; including continuous internal temperature sensing of appliances; and establishing a calibration protocol for the metering equipment. The revised protocol was reviewed and approved by the Evaluator and the metered data was used in the 2017 Appliance Retirement evaluation.	Complete
Continue monitoring key market indicators to adapt program component offerings when needed. Increasing adoption of LEDs by consumers and changes in retailer offerings were noticed during the 2016 evaluation. The high number of LEDs sold during the 2016 year (either within or without the campaign periods) and the declining retail price of LEDs (see Subsection 6.2) indicate market barriers have been reduced, especially for A-type LEDs. The Evaluator recommends continuing to monitor key market indicators such as the price of LED lamps and number sold, participating number of retailers, customer awareness and experience with LED lamps, as well as their penetration rate in Nova Scotia households. These data should be deeply analyzed in the next evaluation to determine if the significant changes observed in 2016 persist over time and to be able to recognize the point where program interventions, in their current form, will no longer be needed for LED lamps, i.e., the point where market transformation is achieved. Based on the state of the market, different exit strategies that can lead to continuous energy savings even after a program or incentive has ended could be investigated.	Instant-R1	Complete	ENS agrees with this recommendation and completed it in 2017. Interviews with retailers were completed in Q4 independently by both the Evaluator and ENS to collect information on key market indicators. The Evaluator reported on findings in the 2017 Residential Efficient Product Rebates (Instant Savings) evaluation report. ENS piloted several non-lighting products in 2017 in the Instant Savings program component and continues to explore other non-lighting measures for future inclusion.	Complete
Closely monitor the evolution of the refrigerator and clothes washer markets. Effective 28 June 2017, a new Canadian energy efficiency regulation identical to the current American regulation comes into force. This regulation will impact the energy efficiency level of refrigerators and clothes washers. It might also significantly affect the baseline energy consumption and thus, the unitary savings value of appliances sold through Instant Savings. It could also impact product offerings, for instance by increasing the number of models that meet ENERGY STAR guidelines and Consortium for Energy Efficiency (CEE) Tier III standards. The Evaluator recommends that this situation be closely monitored and analyzed in 2017 to confirm whether it is still relevant and cost-effective to offer incentives for refrigerators and clothes washers and, if so, select the right energy performance criteria to ensure a certain level of savings and impact in the market.	Instant-R2	Complete	ENS agrees with this recommendation and has completed it. Instant Savings retailers shared inventory data with ENS that showed that most of the refrigerators and clothes washers available in the Nova Scotian market already met the new federal standards for energy consumption as of mid-2017. ENS therefore adopted the new federal standards as a baseline for refrigerators and clothes washers effective in June, 2017. ENS continues to monitor the market to assess the cost effectiveness of appliance rebates in 2018.	Complete
Assign staff to answer EA questions about HEA. To clear some of the confusion created by the changes HEA has undergone since April 2015, EAs asked for a single ENS contact to answer their questions and inquiries, especially about eligibility requirements. EAs also mentioned the need for additional training for themselves. Facilitating transmission of information to EAs could also have a positive impact on participants who mentioned unclear HEA requirements as a source of dissatisfaction with HEA in 2016.	HEA-R1	Complete	ENS agrees with this recommendation and has assigned two ENS staff to answer EA questions about HEA. ENS has also taken steps to better facilitate the transmission of information to EAs and will continue investigating how best to support additional training for EAs.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Use the unitary savings established as part of the 2016 HEA evaluation to determine the savings generated by the DHW measures. During this evaluation, the Evaluator assessed how best to determine the savings associated with DHW measures recently introduced in HEA, and established unitary savings for each type of DHW system. Unitary savings values were favoured over the simulation results to provide more accuracy and consistency with the savings claimed among the different residential program components. Only a small number of DHW measures (two) were installed by HEA participants in 2016, but since this number is expected to increase, the Evaluator recommends integrating the unitary savings values as the method to claim DHW measure savings in the HEA tracking system.	HEA-R2	Complete	ENS agrees with this recommendation and has integrated the unitary savings values established through the evaluation into the HEA tracking system to accurately capture DHW savings.	Complete
Maintain follow-ups with EAs and continue to conduct project reviews to assess the progression of simulation file quality. As part of the 10 HEA project reviews (on site visits and HOT200 simulation reviews), the Evaluator noted that EAs generally performed well in recording household energy component data, though there were some differences in the quality of the reviewed simulation files. The Evaluator noted opportunities to increase the accuracy of HOT2000 simulations and recommends sharing with EAs those aspects that ENS would like to improve. ENS already conducts follow-ups with EAs and the Evaluator recommends continuing to do so. Project reviews should also be conducted on a regular basis to continue monitoring the quality of simulations and monitor progress. Finally, if the HOT2000 software should ever be modified, or if considerable improvement is made to the quality of simulation files, the overestimation ratio should be reviewed with a new billing analysis to increase accuracy of the savings calculations.	HEA-R3	Complete	ENS agrees with this recommendation and continued to conduct follow-ups with EAs and perform project reviews in 2017. ENS and its partners began using a new version of the HOT2000 modelling software in late 2017, so the Evaluator recommended a billing calibration analysis for the 2018 evaluation.	Complete
Monitor market progress to adapt the program component offer to the evolving market. According to the retailers of biomass measures and heat pumps interviewed as part the 2016 evaluation, the market has changed a lot in the last few years. Changes were noticed in consumer awareness and interest, variety of equipment offered, levels of product quality, and price. Moreover, some of the products rebated were mentioned as very popular among the portion of consumers who are not very price sensitive. The Evaluator recommends conducting general population surveys or market actor consultations to better understand how the market is evolving and to what extent the market has transformed. Depending on the level of market transformation achieved and the barriers still found in the market, the program component offer (eligible products, rebate amounts) and delivery should be adapted. If necessary, eligibility criteria should be revised to ensure products offered through Green Heat are the best in terms of energy efficiency and not currently widely purchased on the market. These data collection activities could also be used to start monitoring market indicators of new products as soon as they are introduced in the market, which would enable both better understanding of program influence at the market level and further study of the market transformation.	GH-R1	Complete	ENS agrees with this recommendation has implemented changes to the eligibility requirements for Cold Climate Mini-split Heat Pumps. The Evaluator conducted additional market evolution research through its evaluation and reported results in the 2017 Existing Residential (Green Heat) evaluation report.	Complete
Increase program component advertising to households and collaborate with retailers. Evaluation results showed fairly high free-ridership levels for products rebated through Green Heat, especially for heat pumps and MSHPs. The Evaluator recommends focusing marketing efforts on (1) better communicating with households, and (2) collaborating with retailers. Advertising the program component more effectively to households could contribute to lowering the free-ridership level by reaching out to homeowners who have not yet decided to replace or supplement their equipment with heat pump, solar or biomass units. Indeed, many surveyed participants conceded that they had already made the decision to install a high-efficiency system before learning about Green Heat. For homeowners who have already decided to change their heating system, retailers could encourage them to choose the most efficient product by offering the necessary information to customers. However, both lack of point-of-sale material and retailer training result in retailers poorly understanding Green Heat. The Evaluator suggests increasing program component knowledge among retailers by providing them with an impetus to more actively promote higher efficiency models, and offering point of sale promotional material. ENS could request retailer inputs about which equipment to promote to achieve energy savings that would not occur otherwise.	GH-R2	In Progress	ENS agrees with this recommendation. In 2017, it increased its marketing and outreach to promote the Green Heat program component. In addition to developing in-store posters, rack cards, and handle hangers for distribution among retailers at no cost to them, ENS implemented a fall marketing campaign with digital ads on Facebook, the Weather Network, and local news websites. Based on the results of the 2017 Green Heat evaluation, ENS plans to continue its outreach, particularly to retailers, in 2018.	2018
Consider real baseline conditions in the savings calculation. The review of the tracking sheet and the results of site visits revealed that many participants already owned either an efficient heating system or a secondary heating system that meets a large portion of their heating needs, thereby reducing the energy savings potential of their home. The billing analysis rendered evidence to support this impact, as the pre installation electrical heating load was estimated at only 11,413 kWh (compared to a previous estimate of 14,600 kWh for a completely electrically-heated home). It is therefore recommended that the efficiency of existing electrical systems and the presence of secondary systems be considered when estimating savings, rather than using unitary savings values that are based on a heating load entirely supplied by an electrical resistance heating system.	GH-R3	Complete	ENS agrees with this recommendation and has implemented it.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Perform the MSHP billing analysis again in 2017. The billing analysis conducted as part of the 2016 evaluation resulted in a major change made to the average savings value for MSHPs. Although this analysis yielded conclusive results, the Evaluator believes that it should be conducted again in 2017 for two reasons: (1) to perform the analysis with a larger sample of participants who will provide sufficient billing data; and (2) to take into consideration any major changes that may occur in 2017 as the Green Heat management team makes adjustments to this relatively new measure.	GH-R4	Complete	ENS agrees with this recommendation. The Evaluator conducted a billing analysis as part of the 2017 Green Heat evaluation. The results are presented in the 2017 Existing Residential (Green Heat) evaluation report.	Complete
Continue researching more accurate sources to estimate the runtime hours of central heating systems. The Evaluator found new sources from available literature that estimated equivalent full load hours for central heat pumps based on energy modelling. This represents an improvement over the previous estimate which was based on a standard value. However, the Evaluator considers that accuracy could be further improved by accounting for actual conditions under which heating systems operate in ENS participants' homes. For instance, the billing analysis established average energy savings for MSHPs at 4,990 kWh, despite an average installed capacity of 21,509 Btu/h. This suggests that MSHPs generally do not run for as many annual hours as originally estimated, notably because of the presence of other heating systems. Conducting a similar billing analysis or a metering study for central heat pumps would therefore allow factoring in parameters that are representative of equipment installed under Green Heat, such as control strategies and interactions with other heating systems.	GH-R5	Complete	ENS agrees with this recommendation. The Evaluator conducted a central heat pump billing analysis as part of the 2017 Green Heat evaluation. The results are presented in the 2017 Existing Residential (Green Heat) evaluation report.	Complete
Limit the number of smart power controllers installed to two per household. The tracking report indicated that 589 RDI participants each received three or more smart power controllers. The Evaluator believes that the third and the fourth controller installed in one house are unlikely to generate the same amount of savings per unit as a unique controller installed per house, since their respective audiovisual systems may be used only occasionally. Also, of the eight participants visited who had received more than one controller, only one still had all the controllers installed, resulting in an average installation rate of 30 percent for this group of participants. Although these results have been obtained from quite a small sample, the Evaluator still believes that having more than two smart power controllers installed might not be an effective way to maximize RDI's impacts.	RDI-R1	Complete	ENS agrees with this recommendation. After further review in 2017, ENS decided to limit the number of smart power strips to two per household as of January 15, 2018.	Complete
Conduct more on-site visits with participants who received smart power controllers. Based on the information collected from the 44 site visits conducted with participants who had smart power controllers installed in 2016, a fairly low installation rate was observed. These 44 visits conducted did not provide enough data needed for establishing an installation rate within an acceptable margin of error. Since a site visit is considered a much more reliable means to validate the installation of smart power controllers than a telephone survey, it is recommended that additional visits should be conducted in early 2017 so as to determine with confidence whether or not the installation rates have decreased in comparison with the previous years.	RDI-R2	Complete	ENS agrees with this recommendation. The Evaluator increased its number of on-site visits for participants who received smart power controllers in 2017 and was able to establish an installation rate with an acceptable margin of error.	Complete
Start measuring spillover in 2017. Spillover has never been measured for RP&C because it has been assumed that RP&C replaces all the inefficient products that could be upgraded by tenants. However, as the lighting market evolves, the Evaluator has observed some spillover in RDI, another direct-install program component. For instance, compact fluorescent lamps are being replaced by LED lamps, and mini-split heat pumps are being installed. Similarly, although most RP&C participants are renters and are presumably less likely to invest in upgrading their homes, they are nonetheless still likely to start installing some of these measures without receiving any incentive encouraging them to do so. Therefore, the Evaluator recommends starting to measure spillover for RP&C in 2017.	RP&C-R1	Complete	ENS agrees with this recommendation. RP&C and RDI merged and rebranded as Efficient Product Installation (EPI) on January 1, 2017. ENS tracked spillover for all 2017 participants in this program component using the 2016 evaluation values.	Complete
Continue conducting project reviews to assess the evolution of the quality of simulation files. As part of the 10 NHC project reviews (on-site visits and HOT200 simulation reviews), the Evaluator noted that EAs generally performed well in recording household energy component data, though there were some differences in quality of the simulation files reviewed. The Evaluator is aware that training was provided to EAs in 2016 and therefore recommends conducting project reviews on a regular basis to keep monitoring simulation quality and monitor progress over time. The Evaluator noted some recurrent mistakes in the HOT2000 simulations (see Subsection 5.1) and will follow up on these aspects during the 2017 evaluation. In the meantime, the Evaluator recommends sharing with EAs those aspects of the project review process that ENS would like to improve.	NHC-R1	Complete	ENS agrees with this recommendation and continues to conduct project reviews. Additionally, ENS worked with Service Organizations to ensure simulation files were of high quality through the transition to the new EnerGuide Rating System by providing a specialized training file and a workshop for all EAs.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Ensure that all required documentation is included in participant files. Though EAs generally performed well in recording household energy component data, the Evaluator could not validate some of the information entered in the simulation files because some required documentation was missing for eight of the 10 projects reviewed, such as specification sheets and drawings. According to NRCan, all documentation required to perform a quality assessment should be provided. Specification sheets should at least be provided for heat pumps and heat exchangers. All participant files should include sufficient details about the building envelope either using a detailed final design evaluation report, or the necessary section views and component drawings to indicate all material layers, insulation levels and thickness contained in wall and ceiling components.	NHC-R2	Complete	ENS agrees with this recommendation and has implemented it. ENS will continue to monitor EA documentation via QA activities.	Complete
Continue improving the BER Mail-in internal review procedure for savings calculations. In 2016, the Evaluator applied large adjustment ratios to five measure categories in BER Mail-in. The lighting measure category required the most adjustments for a number of reasons: (1) hours of use (HOUs) were not representative of facility schedule; (2) ballast factors were used inconsistently; and (3) baseline wattages were sometimes inadequate. The Evaluator encourages ENS to implement measures to specifically address these issues, such as modifying the application form to gather more detailed information on HOUs, adding a verification step specific to the inclusion of the ballast consumption for baseline wattages and using the efficient fixture specification sheet to establish the baseline for new construction applications.	BER-R1	Complete	ENS agrees with this recommendation and has completed it. First, it modified both the BER and SBES program components' participant forms/worksheets to collect additional HOU information from participants. The launch of the new forms/worksheets was coupled with three information sessions for Efficiency Trade Network members and contractors. Second, ENS updated its CIRx tool to enable consistent use of ballast factors. Third, new procedures have been established for baseline wattages in BER new construction projects.	Complete
Implement complete measurement and verification (M&V) procedures for Mail-in projects generating large energy savings. The Evaluator has observed that large projects are increasingly part of BER's Mail-in project portfolio. For simpler and smaller projects, relying on documentation provided by the participant and performing simple validations may be adequate to establish savings with a fairly good level of accuracy and reliability. For large projects, the Evaluator recommends that a thorough and systematic M&V protocol be implemented, which should include on-site validation, verification of technical documentation and, where warranted, measurement of key parameters. ENS is currently developing such M&V procedures for Retrofit projects. The same procedures should be applied to BER projects generating 300,000 kWh and more to limit the corrections needed to the tracked energy savings.	BER-R2	Complete	ENS agrees with this recommendation and has established a BER M&V protocol which includes metering and data logging for projects over one GWh. The protocol has been developed and will be implemented in 2018. During 2018, BER will continue to develop specific verification and validation processes for specific technologies.	Complete
Conduct deeper market analysis to adapt the BER Instant Rebates offer when needed. Strong market evolution was noticed for 2016. The high number of LEDs sold during the 2016 year, their declining retail price and the increase of free-ridership levels for these products indicate that market barriers have been reduced. Moreover, LED linear fixtures are more often included in the plans and specifications of large new construction projects. The Evaluator therefore recommends conducting deeper market analysis in the next evaluation to determine if the significant changes observed in 2016 persist over time and to recognize the point at which some product categories should be removed from the Instant Rebates service due to a high level of market transformation. To obtain insights and data from the BNI market, which is a challenging task, the Evaluator recommends multiplying data sources as much as possible. For example, interviews with contractors might be performed to confirm the input obtained from interviews with distributors. Sales data of non-efficient lighting products, if available, might also allow comparing the sales level of products rebated through Instant Rebates.	BER-R3	Complete	ENS agrees with this recommendation. As part of the 2017 evaluation, the Evaluator conducted additional activities to gather data on key market indicators in the LED market. The results are reported in the 2017 Efficient Product Rebates (BER) evaluation report.	Complete
Update the values used in the BER Mail-in and Instant Rebates calculations to match the 2016 evaluation results. The Evaluator updated a number of values as part of the 2016 evaluation. The methodology for calculating interactive effects was revised, as were the operating hours of heat pumps (equivalent full load hours). It is recommended that ENS update these values in their tracking system for 2017.	BER-R4	Complete	ENS agrees with this recommendation and has implemented it. The new assumptions and baseline values have been updated in the CIRx tool, and were applied to all applicable 2017 projects.	Complete
Develop tools to help service providers better promote and deliver Building Optimization. Service providers interviewed noted that participants tend to misunderstand the scale and scope of the Building Optimization participation process and the outcomes to be expected. Therefore, the Evaluator recommends developing marketing materials, such as case studies illustrating the typical activities and outcomes associated with Building Optimization, to assist the service providers in recruiting potential participants. It is expected that having more organizations better informed about Building Optimization's process and benefits will help drive participation levels higher.	Custom-R1	Complete	ENS agrees with this recommendation and has developed a brief overview of the Building Optimization service for service providers. When asked about other marketing needs, service providers reported that they are satisfied with the new material.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Identify the root causes of New Construction's low participation. Although the ongoing slowdown in Nova Scotia's construction industry is beyond ENS's control, the Evaluator still considers it necessary to properly examine and analyze the causes leading to New Construction's low participation level. Since only two participants were interviewed for this evaluation, the Evaluator cannot provide insightful conclusions about the barriers encountered by participants. Interviewing a larger group of participants and, even more importantly, non-participants could provide useful information and insights on how to make New Construction more attractive to more potential participants. These interviews could be conducted as part of the 2017 evaluation.	Custom-R2	Deferred	ENS agrees with this recommendation and relaunched the New Construction service in Q2 of 2017. ENS will continue to monitor feedback from consultants and participants, and adjust the updated service as necessary. If participation remains low through 2018, ENS and its Evaluator will consider additional evaluation activities to investigate further.	To be considered in a future year
Start using the new method for calculating interactive effects associated with Retrofit lighting projects. In 2016, the Evaluator improved the methodology used by ENS for calculating interactive effects in Retrofit and applied it to all commercial program components. It is recommended that this new methodology be applied in 2017.	Custom-R3	Complete	ENS agrees with this recommendation. ENS has implemented this for all Retrofit lighting projects in 2017 and will continue using the new method in 2018.	Complete
Ensure that a systematic review of Retrofit's peak demand savings calculations is performed. This year, the adjustment ratio established for Retrofit projects' peak demand savings was high mainly because the consultants failed to account for the peak demand savings in their calculations, or ENS took too much caution in tracking savings for those projects that were not simple load reductions, such as lighting replacements. In order to better estimate peak demand savings, the Evaluator suggests that ENS require (1) that the consultants include peak demand savings calculations as a mandatory element in their submission packages, and (2) that all projects without peak demand savings be validated through an internal review process.	Custom-R4	Complete	ENS agrees with this recommendation and worked to build internal awareness and expertise estimating demand savings throughout 2017.	Complete
Implement a standardized process for validating M&V results and savings for Retrofit projects. Two main types of errors were detected and corrected as part of this evaluation: (1) incorrect assumptions for the operating conditions; and (2) necessary variables omitted from the savings calculations, such as correction factors for tri-phased current and interactive effects. A more significant error was found for one project where the equipment installed was not the same as that assumed in the savings calculations. To improve savings estimation accuracy, ENS should improve its M&V procedures by developing M&V summaries and standardized tools, which would help ensure that all key variables are systematically validated at the time of project close-out.	Custom-R5	Complete	ENS agrees with this recommendation and has developed a project summary tool, which includes a site visit checklist and M&V guidance. This tool will be used for all 2018 projects and is included with project documentation.	Complete
Include an estimate of peak demand savings in the M&V plans for Building Optimization projects. By reviewing a sample of three projects, the Evaluator found that peak demand savings should have been tracked for two of them. ENS should require that all M&V plans include either an estimate of peak demand savings or a summary of the energy conservation measures with the potential to reduce peak demand.	Custom-R6	Complete	ENS agrees with this recommendation. ENS requests that all service providers develop demand savings calculations, which ENS reviews.	Complete
Continue to support EMIS and identify potential new participants. Participants value the support they receive from their service provider and ENS. Overall, they are highly satisfied with EMIS although for different reasons. Some appreciated the energy savings, while others appreciated the additional information the system provided. Additionally, EMIS 2016 demonstrated potential for additional savings beyond the first year of participation. For these reasons, the Evaluator concludes that EMIS is successful and should be continued and expanded.	EMIS-R1	Complete	ENS agrees with this recommendation. ENS's Business Development Managers and program staff continue to work with prospective participants to enroll them in the EMIS program component. ENS anticipates seeing the impact of 2017 recruitment efforts in 2018.	Complete
Continue encouraging EMIS participants to enroll in SEM and strengthen integration between the two program components. There is a natural connection between EMIS and SEM. SEM aims to change the culture of an organization in terms of how the organization views and manages energy. EMIS provides infrastructure and technical support to identify operational and process savings. Many organizations participating in one program component would benefit from the services offered by the other. It is also believed that participation in both EMIS and SEM would increase participant internal energy management capabilities and commitment, thereby helping achieve deeper and more sustainable savings.	EMIS-R2	Complete	ENS agrees with this recommendation and continues to encourage cross-participation in EMIS and SEM. ENS has identified one past EMIS participant who has expressed interest in SEM for 2018 and is working with them to meet their needs.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Track incremental savings rather than cumulative savings. For continuing participants in 2016, the Evaluator modified the methodology used to establish savings so that they correspond to incremental first-year savings. Indeed, savings were tracked with respect to a baseline period that spanned approximately one year prior to the beginning of EMIS activities. When participants continued taking part in EMIS for a second year, their tracked savings were the result of the sum of actions taken since the beginning of their participation and not only the additional actions taken since 2015. This was considered standard industry practice. Since ENS established all of its program component savings targets as incremental savings, the evaluated savings were modified to correspond to that definition. Energy savings that persist year over year only as a result of on-going support or intervention from ENS could also be classified as incremental savings and are not captured under the methodology used in this evaluation because no data on the rate at which savings would decrease in the absence of on-going support is available in the technical literature. As new research is conducted on the impact evaluation of programs similar to EMIS, this methodology might be refined to capture all incremental savings.	EMIS-R3	In Progress	ENS agrees with this recommendation and took steps in 2017 to build the required internal resources to create a new baseline for continuing participants. ENS and its service provider re-baselined savings models for three EMIS models and the Evaluator re-baselined the fourth EMIS model. ENS will continue building its capacity for re-baselining models in 2018 to track incremental savings.	2018
Investigate ways of using energy management information systems to their full potential. The Evaluator noted that some participants who had been part of the 2015 impact evaluation had not implemented new energy conservation measures in 2016. While sustaining the savings achieved in previous years is a success in itself, the Evaluator believes that this indicates a potential for even greater savings with minimal additional investment by ENS. Since energy management information systems offer such a wealth of information to participants, the program component should ensure that they are used for continuous improvement and generate as much savings as possible. The program component could include additional support to participants or some form of performance incentive for service providers to identify potential new measures after easy, low-cost measures have been implemented.	EMIS-R4	Complete	ENS agrees with this recommendation and has taken measures to increase incremental energy savings with existing participants. ENS currently has agreements with two existing EMIS participants, which aim to achieve additional energy savings above the incremental energy savings attained the previous year.	Complete
Track major changes to facility operations and equipment and adjust energy baseline consumption as required. The Evaluator identified one project for which the compressed air system had been replaced as part of a Custom Retrofit project in 2016. This modified the baseline energy consumption of the plant and resulted in double-counting savings. The Evaluator made this adjustment, but did not have sufficient data to update the baseline regression; new data should be gathered to update this baseline energy regression in 2017. To avoid this in the future, systematic reviews of facility operational and equipment changes should be implemented by ENS to ensure the accuracy of reported savings.	EMIS-R5	In Progress	ENS agrees with this recommendation and continues to discuss data requirements with the Evaluator and integrate new participant reporting requirements into the program component.	2019
Continue to support SEM and identify potential new participants. Participants value the support they receive from their service provider and ENS. Also, SEM participants generated high energy savings in their first year of participation. The success of SEM could be expanded if the program component were able to identify more potential participants.	SEM-R1	In Progress	ENS agrees with this recommendation. Two new participants enrolled in SEM in late 2017, and a third participant enrolled in March 2018. Program staff and the Business Development team are actively recruiting additional 2018 participants.	2018
Continue encouraging SEM participants to enroll in EMIS and strengthen integration between the two program components. There is a natural connection between EMIS and SEM. SEM aims to change the culture of an organization in terms of how they view and manage energy. EMIS provides infrastructure and technical support to identify operational and process savings. Many organizations participating in one program component would benefit from the services offered by the other. It is also believed that participation in both EMIS and SEM would increase participant internal energy management capabilities and commitment, thereby helping achieve deeper and more sustainable savings.	SEM-R2	In Progress	ENS agrees with this recommendation and worked with past SEM participants in 2017 to complete EMIS assessments. ENS anticipates that at least one of these participants will move forward with EMIS in 2018.	2018
Consider extending the SEM cycle to engage participants for a longer period of time. The service provider suggested having longer periods of participation in SEM, and participant feedback suggests that having participants engage with the service provider for a longer period of time may yield additional savings and help further institutionalize energy management in the culture of participating firms. This has been common in other SEM programs in North America.	SEM-R3	Deferred	At this time, ENS does not have all of the information it needs to perform a full analysis of the cost-effectiveness of extending the SEM cycle. ENS will consider implementing this recommendation in a future year.	To be considered in a future year

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Track incremental savings rather than cumulative savings. For continuing participants in 2016, the Evaluator modified the methodology used to establish savings so that they correspond to incremental first-year savings. Indeed, savings were tracked with respect to a baseline period that spanned approximately one year prior to the beginning of SEM activities. When participants continued taking part in SEM for a second year, their tracked savings were the result of the sum of actions taken since the beginning of their participation and not only the additional actions taken since 2015. This was considered standard industry practice. Since ENS established all of its program component savings targets as incremental savings, the evaluated savings were modified to correspond to that definition. Energy savings that persist year over year only as a result of on-going support or intervention from ENS could also be classified as incremental savings and are not captured under the methodology used in this evaluation because no data on the rate at which savings would decrease in the absence of on-going support is available in the technical literature. As new research is conducted on the impact evaluation of programs similar to SEM, this methodology might be refined to capture all incremental savings.	SEM-R4	In Progress	ENS agrees with this recommendation. There were no 2017 SEM savings but ENS and the SEM service provider are prepared to track incremental energy savings for each participant in 2018.	2018
Improve the identification of event types in the Event Log. The Event Log is a valuable tool for conducting the SEM impact evaluation and it generally contains more information this year than in 2015. However, the Evaluator found that the event categories suggested in the document were not specific enough; for instance, there should be different categories for elements impacting the baseline and the energy efficiency measures implemented, rather than categorizing them all as operational changes.	SEM-R5	In Progress	ENS agrees with this recommendation. ENS has created a new event log template for SEM participants. The new event log will provide a greater level of detail on the actions implemented in a facility and will improve the accuracy of savings calculations.	2018
Identify energy efficiency measures installed under ENS instant rebate programs. During the project review, the Evaluator identified several projects for which products were most likely bought with a point-of-sale rebate, but could not find evidence to confirm this. To avoid counting savings twice, it is suggested that SEM participants be asked to provide invoices of energy efficient products bought under ENS instant rebate programs.	SEM-R6	In Progress	ENS agrees with this recommendation. Program staff and the SEM service provider will work with participants to track energy efficiency measures bought with a point-of-sale rebate and ensure that any associated savings are deducted from SEM savings.	2018
Apply the adjustments made to the baseline energy regression in the 2016 evaluation to continuing participants. Two of the three continuing projects from 2015 had their baseline energy regression adjusted under the 2015 impact evaluation. These adjustments were still valid for the 2016 evaluation, but were not carried out by the service provider. Therefore, the Evaluator recommends that the project-specific adjustments made in this evaluation be applied to continuing projects going forward.	SEM-R7	In Progress	ENS agrees with this recommendation. There were no continuing SEM participants in 2017, but ENS is prepared to adjust the baseline for any participants that take part in SEM for more than one year.	2018

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Assist participants throughout the participation process, from enrollment to completion, to minimize the number of participants who do not complete projects and encourage equipment installation. Participants receiving no assistance from contractors throughout the participation process face considerable barriers to implementing projects, including making decisions without technical assistance and spending time seeking bids. Without the assistance of contractors, participants do not make their project a priority, thus leading to potential delays in or failure to complete projects. Any actions ENS can take to connect contractors with participants and remind them that the program component offer is still available should yield more implemented projects. Some examples illustrating how other program administrators have taken meaningful actions to support participants include: randomly assigning contractors to participants; adding general contractors to their trade networks to ensure participants have access to contractors that can manage entire projects; and having the audit report specify a list of contractors who can address each identified measure.	SBES-R1	Complete	ENS agrees with this recommendation and has made several improvements to its Opportunities Report (given to participants after an audit) to enhance the participant experience and encourage project completion. Examples of improvements include: extra information about financing, simple payback times alongside the list of opportunities, and a link to the Efficiency Trade Network to help participants find the contractors they need. ENS has also begun following up directly with participants as projects near their expiry date.	Complete
Engage, support, and provide resources to help contractors promote SBES among potential participants. The highest implementation rates have been so far achieved by contractor-assisted DIY projects. All efforts made by ENS to develop and strengthen its relationships with contractors can potentially stimulate more occurrences of contractor-assisted DIY projects and enable completing more projects. Some examples illustrating how other program administrators have taken meaningful actions to support contractors include: providing preprinted marketing materials; offering cooperative marketing support; offering sales training to contractors; offering a program-specific training session once a year; and conducting outreach to contractors about the program using mailings, phone calls, or by hosting contractor breakfasts throughout the province.	SBES-R2	Complete	ENS agrees with this recommendation and provided support to its SBES contractors throughout the year. In 2017, ENS took extra measures to help contractors understand the program component, offer high quality service, and promote SBES. 2017 contractor engagement activities included: (1) conducting on-site walkthroughs to discuss data collection requirements; (2) assisting contractors with DesignLights Consortium navigation; (3) sending detailed outlines that describe SBES steps in project completion; (4) hosting in-house meetings to discuss the SBES process; (5) offering marketing material to contractors to leave behind at businesses and promote ENS programs.	Complete
Consider working with auditors to make the process of developing cost estimates less burdensome for auditors, contractors, and distributors. Currently, the audit path requires auditors to obtain new cost estimates for each project. Auditors call distributors and contractors who then voluntarily provide bids for the identified measures of a project. These contractors and distributors are unlikely to obtain the project simply because the auditor contacted them, partly because the auditor cannot recommend these contractors to participants. To address this issue, ENS could meet with auditors to discuss alternative methods for estimating costs.	SBES-R3	In Progress	ENS agrees with this recommendation and is gathering price estimates for lighting and other common non-lighting measures. Once this information is gathered and summarized, ENS will share it with auditors.	2018
Improve the application forms and the internal review procedure to ensure the accuracy of savings calculations for DIY projects. The Evaluator found that the variables used in the savings calculation algorithm were often not representative of the actual equipment and operating conditions observed on site. The hours of use for lighting measures were the variables that required an adjustment most often, and those adjustments were generally significant. The Evaluator believes that requesting more information in the application forms would at least partially address this issue; operation schedules should be provided for each measure in each area of the facility. The Evaluator found multiple cases where the hours of use entered in the tracking sheet were the same for all the measures, while the real hours of use varied throughout the facility. Special attention should also be paid to validating the quantities of fixtures and lamps installed; currently, most invoices do not include sufficient information needed for validating the quantities claimed for each project.	SBES-R4	Complete	ENS agrees with this recommendation and developed new participant worksheets that capture more detailed information about hours of use and the location of lighting measures.	Complete
Identify those SBEAs who are qualified to conduct audits at industrial facilities. The on-site visits conducted during energy audits showed that SBEAs possess varying skill levels. While all SBEAs conducted the audit in a professional manner, one SBEA mentioned that he did not have the technical background needed for evaluating energy-saving opportunities at an industrial facility. Industrial facilities require specific technical knowledge. Therefore, ENS may want to identify those SBEAs who are qualified for making industrial facility assessments and assign them to industrial-sector participants.	SBES-R5	Complete	ENS agrees with this recommendation. With the execution of new SBEA contracts in 2017, ENS began offering three tiers of energy audits to small businesses, which are categorized by common measure and building type. Each audit tier requires different qualifications, with the highest level of qualifications needed for manufacturing and industrial audits.	Complete
Focus the 2017 evaluation on the same standards as evaluated in 2016. While the new standards set forth in Amendment 13 will come into force at the end of June 2017, their impact may be limited until January 2018, since retailers need a few months to sell their existing stocks. The Evaluator recommends keeping the 2017 evaluation's focus on evaluating the impact of the same standards evaluated in 2016, while starting to collaborate with NRCan and the industry associations to collect market data on the new products affected by Amendment 13. Past evaluations showed that collecting historical market data from regulatory organizations and industry associations is an indispensable source of information needed for the effective assessment of the provincial market size following the implementation of new standards. The next impact evaluation should start identifying how market data regarding the new targeted products can be obtained; contacts should be made with major stakeholders to collect data about the market evolution that took place over the last five to 10 years.	CS-R1	Complete	ENS's Evaluator included some Amendment 13 product types in the 2017 Codes & Standards evaluation. Both ENS and its Evaluator agree with the rationale behind this recommendation, however, based on preliminary investigation, the market-lag typically associated with the introduction of new product regulations was largely absent with respect to certain Amendment 13 products. Therefore, additional products were added to the 2017 Codes & Standards evaluation.	Complete

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
The Savings Verification study recommends acceptance of the 2016 evaluation results for energy savings and for demand-reduction for all programs.	Recommendation General-SV-1	N/A	No action required.	N/A
In future years, ENS should require the Evaluator to include a copy of the operative evaluation plan within the overall Executive Summary, supplemented by a discussion of why, on balance, selected dropping of evaluation components or introduction of reduced rigor is considered appropriate. In addition, in the individual program write-ups, dropped and reduced evaluation components should be noted and the rationale for dropping or reducing these evaluation components should be explained.	Recommendation General-SV-2	Complete	ENS agrees with this recommendation. In the 2017 DSM Programs Evaluation Executive Summary, the Evaluator described the types of evaluations each component underwent in both 2016 and 2017 (process, market, impact). The Evaluator identified which components saw reduced activities in 2017 compared to the 2016 evaluation and described the rationale for these changes. For further clarity, where reduced evaluation activities took place, the Evaluator described the differences between its 2016 and 2017 approach in the Methodology section of the corresponding program component report.	Complete
In future years, ENS should require the Evaluator to provide a summary table of obtained confidence and precision levels along with population and sample size for all calculations for which confidence and precision levels were developed. Also, the Evaluator should state the overall targets for confidence and precision for the evaluations, and provide a discussion of results in the table. Any variation in the targets and any results that do not meet the targets should be explained.	Recommendation General-SV-3	Complete	In each evaluation report's Methodology section, the Evaluator identified the types of margins of error calculated, and target margins of error and confidence levels. When presenting results with margins of error, the Evaluator included margin of error values in tables alongside other relevant figures such as population and sample size. To further clarify how the Evaluator calculated the five defined margins of error, the Evaluator presented example calculations in Appendix II of the 2017 DSM Programs Evaluation Executive Summary.	Complete
In future years, ENS should specify rules to bound the dropping of evaluation components and to bound the reduction of program impact evaluations. There should be a systematic understanding and articulation of risks to evaluations producing usable and defensible knowledge. For example, a rule could be that impact evaluation for a program will be reduced no more frequently than every other year. Or that process evaluations will skip more than two years in a row. It is quite possible to do some trade-offs to conserve dollars, with the approval of the Advisory Group. But these kinds of trade-offs need to be carefully watched and rules set up to protect the continuing validity and precision of evaluation results.	Recommendation General-SV-4	In Progress	ENS agrees with this recommendation. ENS has now completed its first full year of condensed evaluations and expects to refine its approach to reducing evaluation activities based on this experience. It is working with the Evaluator to develop a set of guidelines to ensure consistent and transparent evaluation planning and expects to finalize guidelines in 2018 that take into account lessons learned during the 2017 evaluation process.	2018
ENS should increase on-site inspection for quality control for all programs that shift from ENS control to reliance on markets.	Recommendation General-SV-5	Complete	ENS agrees with this recommendation. The only program to which this recommendation would currently apply is Small Business Energy Solutions (SBES). SBES completed site visits on approximately 23% of all 2017 SBES projects. This was an increase from 10% in 2016.	Complete
In addition to reporting first-year impacts, ENS and the Advisory Group should consider the benefits and cost of also providing savings estimates based on expected lifetimes to support comparisons among programs and to improve foresight.	Consideration General-SV-1	Complete	ENS agrees with this consideration. The Evaluator included lifetime savings in each of its 2017 evaluation reports.	Complete
For program types that permit, ENS and the Advisory Group should consider the potential benefits and costs of introducing selected persistence evaluations to empirically document lifetimes and persistence of savings.	Consideration General-SV-2	Not Recommended for Action	ENS appreciates this consideration but does not recommend pursuing it at this time. The Evaluator reviewed Effective Useful Lives (EULs) and lifetime savings for the first time in 2017. ENS and the Evaluator plan to continue refinement of the current savings persistence methodology.	N/A

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
ENS and the Advisory Group should consider the potential benefits and costs involved to employ a market transformation framework. This would apply to a limited subset of programs/measures (see specific program recommendations).	Consideration General-SV-3	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. ENS will continue monitoring key market indicators for key product types moving forward.	Complete
ENS and the Advisory Group should consider the potential benefits and costs involved in requiring the Evaluator to report non-utility benefits for climate mitigation.	Consideration General-SV-4	Complete	ENS agrees with this consideration. ENS's Evaluator included avoided greenhouse gas emissions from ENS's DSM work in its 2017 evaluation reports.	Complete
ENS and the Advisory Group should consider initiating discussion with the province and climate adaptation advocates of the intersection between DSM and climate adaptation, particularly in new construction.	Consideration General-SV-5	Not Recommended for Action	ENS appreciates this consideration. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, ENS would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
For A-type LEDs, the 2017 Instant Savings Program Evaluation ENS should consider the costs and benefits of using a market transformation paradigm rather than a resource acquisition approach (including study of market effects). This would include development of the S-curve for the A-type LEDs and fully discuss market transformation program implications. The evaluation would also discuss monitoring A-type LEDs in future years to confirm the stability of a transformed market, and the attribution of subsequent market impacts.	Instant-SV-R1	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. The Evaluator included a technology diffusion illustration (includes an S curve) in the Residential Efficient Product Rebates (Instant Savings) evaluation report to visually represent their findings on the status of the market. ENS will continue monitoring key market indicators for LEDs moving forward.	Complete
In the 2017 evaluation for the Green Heat high efficiency mini-split heat pump measure, ENS should consider the benefits and costs of structuring the evaluation as a market transformation evaluation. Continuing treatment as a resource acquisition evaluation with an expanded market evaluation is stretching against the boundaries of that type of evaluation approach.	Green Heat-SV-R1	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. The Evaluator did not have the data required to identify precise MSHP market adoption on the theoretical curve of technology diffusion but the Market Evolution section provides valuable insights that will help ENS keep its programs relevant and effective in the residential MSHP market. ENS will continue monitoring key market indicators for MSHPs moving forward.	Complete

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
ENS should consider meeting with the appropriate provincial agency and environmental advocates to discuss the evolving intersection of DSM with climate adaptation, particularly for new construction and major renovation projects such as Net Zero and Passivhaus projects.	New Home Construction-SV-R1	Not Recommended for Action	ENS appreciates this recommendation. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, ENS would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
ENS should consider the benefits and costs of structuring the 2017 evaluation for the LED measures for Business Energy Rebates as a market transformation evaluation rather than as a resource acquisition evaluation with a market evaluation.	Business Energy Rebates-SV-R1	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. The Evaluator included a technology diffusion illustration (includes an S curve) in the Efficient Product Rebate (BER) evaluation report to visually represent their findings on the status of the market. ENS will continue monitoring key market indicators for LEDs moving forward.	Complete
ENS should consider meeting with the appropriate provincial agency and with climate adaptation advocates to explore the evolving overlap of DSM and climate adaptation and to develop a list of climate adaptation criteria for new construction and major renovation projects.	Custom-SV-R1	Not Recommended for Action	ENS appreciates this recommendation. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, ENS would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
We agree with the Service Provider recommendation of greater coordination between the EMIS and SEM program. Further, we recommend that ENS consider merging the two programs into a single customer offer. While there are unique attributes of each that would need to be considered when combining SEM and EMIS, other utilities offer a single program for both.	EMIS-SV-1	In Progress	ENS agrees with this recommendation and continues to encourage cross-participation in EMIS and SEM. ENS has identified past EMIS and SEM participants who have expressed interest in the other program component for 2018. ENS is working with these participants to meet their needs. ENS continues to explore the option of merging the two offerings.	2018
Add the following EMIS related terms to the Definitions (p. iii); Baseline regression, Projected baseline, Adjusted baseline, Cumulative EMIS/EMIS savings, Incremental EMIS/EMIS savings. The EMIS/EMIS definitions for cumulative and incremental savings should reference the relationship between reported energy usage and the projected baseline.	EMIS-SV-R2	Complete	ENS agrees with this recommendation. The Evaluator clearly defined all relevant terms in the 2017 Custom Incentives (EMIS) evaluation report. Please note that in some cases, the Evaluator's terms are slightly different from those listed in the Verification Consultant's Recommendation EMIS-SV-2.	Complete
One way to more clearly communicate the approach is to show the results for each step and each project. Having a table with columns for 2016 Projected baseline, Adjustments, Adjusted baseline, Actual energy usage and Incremental savings would more clearly show the methodology and results. More columns may be required to show certain details such as the adjustment for savings from other ECM programs. Presumably such a table would also make clear how the value of 0.431 "Adjustment Ratio for Energy Savings" was calculated.	EMIS-SV-3	Complete	ENS agrees with this recommendation. To help communicate results more clearly in the 2017 Custom Incentives (EMIS) evaluation report, the Evaluator added summary tables of all reviewed EMIS projects. These tables include measures implemented, non-routine adjustments, adjustment ratios, and savings for each participant. The Evaluator used their best judgment to apply the Verification Consultant's recommendations, while balancing the need for clear and transparent information in the report and protection of participant information.	Complete
Add the following SEM related terms to the Definitions (p. iii); Baseline regression, Projected baseline, Adjusted baseline, Cumulative SEM/EMIS savings, Incremental SEM/EMIS savings. The SEM/EMIS definitions for cumulative and incremental savings should reference the relationship between reported energy usage and the projected baseline.	SEM-SV-R1	In Progress	ENS agrees with this recommendation. SEM did not achieve savings in 2017 and therefore, the Evaluator did not write a 2017 SEM evaluation report. The Evaluator will define all relevant terms in the 2018 SEM evaluation report.	2018

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
We support the Service Provider recommendation of a longer engagement with SEM participants.	SEM-SV-R2	Deferred	At this time, ENS does not have all of the information it needs to perform a full analysis of the cost-effectiveness of extending the SEM cycle. ENS will consider implementing this recommendation in a future year.	To be considered in a future year
One way to more clearly communicate the approach is to show the results for each step and each project. Having a table with columns for 2016 Projected baseline, Adjustments, Adjusted baseline, Actual energy usage and Incremental savings would more clearly show the methodology and results. More columns may be required to show certain details such as the adjustment for savings from other ECM programs. Presumably such a table would also make clear how the value of 0.463 "Adjustment Ratio for Energy Savings" was calculated.	SEM-SV-R3	In Progress	ENS agrees with this recommendation. SEM did not achieve savings in 2017 and therefore, the Evaluator did not write a 2017 SEM evaluation report. The Evaluator will consider how to refine the presentation of SEM data in the 2018 SEM evaluation report.	2018
Edits/Corrections: On P. 55, Figure 11, should the 2015 participant bar be 6 and not 9? On P. 64, third bullet, should the bullet read "Three respondents…" instead of "Two respondents…" See Table 24, p 62.	SEM-SV-4	Complete	ENS and its Evaluator reviewed the 2016 Custom Incentives (SEM) evaluation report and confirmed the following: (1) The 2015 participant bar is correct. There were nine participants in total: three continuing participants from the previous year and six new participants. (2) The third bullet on P. 64 is correct. It refers to the third column titled "Resources Provided" in Table 25 above the text.	Complete
For future evaluations, please systematically address what savings would have resulted naturally via Naturally Occurring Market Adoption Factors (NOMADs) for each MEP, and decrease impacts by those amounts for each MEP.	SV-MEPS-1	Not Recommended for Action	ENS appreciates this recommendation but notes that influencing codes and standards (also known as Minimum Energy Performance Standards (MEPs)) is not a primary focus for ENS. ENS reports on these energy savings for informational purposes only, but does not claim them. Because of this, and as pursuing this recommendation would have a significant impact on the evaluation budget, ENS does not suggest pursuing this recommendation at this time.	N/A
In the next evaluation, the evaluator should carry out the attribution step for each MEP.	SV-MEPS-2	Not Recommended for Action	ENS appreciates this recommendation but notes that when new codes and standards come into effect, ENS does not provide incentives for these measures because its influence is not required to achieve savings. Additionally, without significant ENS resources going toward influencing new codes and standards, ENS expects that savings attributable to ENS would be minimal. Because of this, and as pursuing this recommendation would have a significant impact on the Codes & Standards evaluation budget, ENS does not suggest pursuing this recommendation at this time.	N/A
Focus the 2017 evaluation on the same standards as evaluated in 2016. While the new standards set forth in Amendment 13 will come into force at the end of June 2017, their impact may be limited until January 2018, since retailers need a few months to sell their existing stocks.	SV-MEPS-3	Complete	ENS's Evaluator included some Amendment 13 product types in the 2017 Codes & Standards evaluation. ENS and its Evaluator agree with the rationale behind this recommendation, however, based on preliminary investigation, the market-lag typically associated with the introduction of new product regulations was largely absent with respect to certain Amendment 13 products. Therefore, additional products were added to the 2017 Codes & Standards evaluation.	Complete

NON-CONFIDENTIAL

Request IR-18:

Regarding Direct Installation program proposed for 2019 DSM plan:

a) Is EfficiencyOne planning to include Affordable Multifamily Housing Pilot in Direct Installation category as it is included in 2017 Evaluation Report (2017 DSM Annual Report, Page 29, Line 14 – 15).

b) Is EfficiencyOne planning to offer any other programs in addition to the Small Business Energy Solutions (SBES) program?

c) Please provide further details for any other programs proposed under Direct Installation besides SBES program for 2019.

Response IR-18:

a) EfficiencyOne is committed to supporting low-income Nova Scotians and to finding innovative and pragmatic approaches to overcome the unique barriers with respect to implementing energy efficiency initiatives. EfficiencyOne will determine if it will continue to offer the Affordable Multifamily Housing Pilot in 2019 following its assessment of the pilot's 2018 performance. Similarly, it is too early for EfficiencyOne to offer certainty on which program would offer the pilot if it is continued in 2019.

b) Small Business Energy Solutions is the only program component that EfficiencyOne is currently planning to include within the 2019 Direct Installation program, subject to the above caveat that the determination of the Affordable Multifamily Housing Pilot's inclusion in ENS's 2019 portfolio will be made at a later date.

c) Please refer to parts a) and b).

NON-CONFIDENTIAL

Request IR-19:

Regarding the Direct Installation (SBES) program in 2019 DSM plan:

a) Is EfficiencyOne proposing any changes, both in terms of measures offering and marketing and program delivery, in 2019 as compared with SBES programs offered in 2017 or currently being offered in 2018?

b) Does EfficiencyOne have separate participation and energy and demand savings targets of SBES program by delivery type (Do-it-your vs Audit)?

c) What percent of SBES savings is EfficiencyOne targeting from lighting measures in 2019?

d) What percent of SBES savings is EfficiencyOne targeting from non-lighting measures in 2019?

e) Is EfficiencyOne planning any activities in 2019 to increase savings from the non-lighting measures?

Response IR-19:

a) EfficiencyOne is not currently proposing any changes to the 2019 Direct Installation program (marketed as Small Business Energy Solutions or "SBES") compared to the 2017 or 2018 Direct Installation program. EfficiencyOne will continue assessing results, best practices, and new information and technologies, which may influence the program's offerings and delivery in the future.

Consistent with the 2017 and 2018 Direct Installation program, EfficiencyOne will continue to seek opportunities to diversify energy savings, expand targeted small business offerings, and build on the strength of the Efficiency Trade Network to provide customers with a means to access knowledgeable, qualified contractors.

b) EfficiencyOne does not set separate targets for audit vs. do-it-yourself options, as the measures supported through both options are largely the same.

NON-CONFIDENTIAL

c) While EfficiencyOne continues to diversify its energy savings, it does not set measure-level savings targets. For a breakout of claimed savings by measure please see the 2017 Direct Installation DSM Evaluation Report.

d) Please refer to part c).

e) EfficiencyOne will continue to seek diversified savings in 2019, however the market will determine the pace of non-residential vs. residential transition from lighting measures. For example, while the availability and pricing of A-series LED lamps may influence the long-term need for residential incentives, the situation for the wide variety of non-residential lighting products is quite different. Many non-residential LED measures still have a high-cost compared to A-series lamps but produce excellent savings for customers across a variety of situations in which A-series lamps would not be appropriate (e.g., linear LEDs, high-bays, directional lighting, and agricultural lighting). Customers (many of whom are small businesses) looking to purchase these measures still require financial support to undertake such projects. It would be inappropriate to group such measures together with residential lighting measures that are seeing higher availability and declining prices, such as A-series LED lamps.

The success of programs and program components such as SBES and Business Energy Rebates (BER), and their respective Evaluations, show that small business customers still require help to undertake cost-effective lighting upgrades. Feedback from stakeholders such as distributors and end-use customers indicates that LED lighting still represents a large opportunity for cost-effective energy savings. EfficiencyOne believes that understanding this distinction between residential and non-residential lighting is important to help prevent the premature removal of the efficiency measures required for small business customers.

NON-CONFIDENTIAL

Request IR-20:

Regarding the proposed demand reduction pilots proposed under Enabling Strategies in 2019 DSM Resource Plan (EfficiencyOne 2019 DSM Plan Filing – Evidence, Page 16 of 23, Line 12 – 14), please provide response to following questions:

a) What is the estimated peak load reduction? What are the economics of the pilot program?

b) Has NSP launched demand reduction programs? If yes, please provide information on budget and estimated savings of such programs.

c) How does the proposed demand reduction programs compare/relate with peak load reduction programs discussed in NSP's AMI Application (M08349) that is currently under review?

d) Are technologies necessary for launching proposed Peak Load Reduction programs already Are technologies necessary for launching proposed Peak Load Reduction programs already available?

Response IR-20:

a) EfficiencyOne has not estimated the peak load reductions possible from the proposed pilot programs, nor included any system-coincident demand savings associated with the pilot programs within its proposed Performance Targets. This treatment is consistent with the approach for other Enabling Strategies activities, both historical and proposed. EfficiencyOne's primary intention with operating these pilot programs is to identify optimal program delivery techniques associated with these measure types, as well as how these measures affect customer load shapes. These objectives will better position EfficiencyOne to propose future demand reduction activities and allow EfficiencyOne to determine more reliable economic estimates associated with such programs.

b) As EfficiencyOne did not have the requested information, it contacted NS Power, which provided the following response:

Peak demand reduction was addressed in the following items:

- Power Shift Atlantic – pilot project that focused on shifting load to follow wind generation via direct utility control of hot water heaters and electric thermal storage heaters;
- Smart Grid/Battery storage;
- Locational DSM report – study examining the impact of DSM on energy and peak at the substation level to evaluate potential savings in T&D capital;
- AMI business case item on Critical Peak Pricing (CPP) – estimate calculated for potential peak reduction as a result of AMI-enabled critical peak pricing;
- LED streetlight impact – estimate calculated for peak impact of new LED streetlight deployment;
- Time of Day (TOD) contribution to peak reduction – study that examined the contribution of the TOD customers to peak reduction;

EfficiencyOne is not aware of any specific budgets or demand reduction targets for these initiatives.

c) NS Power has proposed future Critical Peak Pricing as part of its AMI Application,[1] and has also mentioned new rate structures[2] and home automation and demand response[3] strategies.

New rate structures, including Critical Peak Pricing, rely on a customer behavioural response, or potentially automated solutions in the case of larger customers. Nevertheless, the customer's response to these pricing signals is discretionary. Critical

[1] M08349, N-1, *Application – Redacted,* Filed October 19, 2017, at Page 34.
[2] *Ibid.,* at Page 39.
[3] *Ibid.,* at Page 38.

Peak Pricing or Peak Time Rebates aim to reduce system-coincident peak demand at critical periods throughout the year, while general time-of-use rates aim to shift customer energy consumption to different times of the day on a more routine basis. These types of rate-based solutions, in addition to requiring discretionary customer behaviour, also rely on AMI infrastructure to appropriately bill customers.

EfficiencyOne's proposed demand reduction pilot options rely on technological solutions (i.e., measures) to impart system-coincident peak demand savings. In this manner, they produce routine reductions in a customer's demand that likely fall within peak periods, without relying on customer behaviour.

In general, time-of-use rates and demand-reducing rate structures are enabling and complimentary when operated in parallel with measure-based demand reduction programs. This is analogous to how inclining-block rate structures can be complimentary to energy efficiency incentive programs.

With respect to Home Area Networks (HANs) and demand response, HANs can be used to facilitate demand response, but their application alone is not a source of demand savings. A HAN can allow for easier communication between appliances and other loads and the utility. HANs are enablers for many demand reduction measures. For example, a HAN may allow for communication between an Electric Thermal Storage (ETS) system and the utility, allowing the utility to use the ETS system to charge during periods of high wind production, or allow the ETS unit to provide ancillary services to the grid, such as frequency regulation.

None of the demand response activities, discussed by NS Power, interfere with the pilot programs proposed as part of the 2019 DSM Resource Plan, and some activities could enable the further success of measure-based demand reduction activities.

NON-CONFIDENTIAL

d) Yes, all technologies related to the proposed demand reduction pilot options are available. The only significant technologies on which these options rely, as currently drafted, are the demand-reducing measures themselves. The technologies included within these options (e.g. ETS systems) are commercially mature.

Please refer to EfficiencyOne's response to UARB IR-15 for more information on demand reduction pilot options.

NON-CONFIDENTIAL

Request IR-21:

Regarding the Rate and Bill Impact Analysis (RBIA) analysis included in Appendix C of EfficiencyOne 2019 DSM Plan Filing:

a) What is the present value of the benefits to the participants of the DSM plan on 2019.

b) What is the impact of proposed 2019 DSM plan by considering avoided costs and lost revenue of both participants and non-participants?

c) How do DSM measures or programs selected at later date impact the RBIA analysis?

Response IR-21:

a) The present value of benefits of the 2019 DSM Plan to participants is approximately $197 million. This was estimated using the estimated average monthly bill savings for a typical participant in each class, the number of participants in each class, and an assumed consumer-average interest rate of 3.00 per cent.

b) The RBIA considers avoided utility costs and lost revenues that are created when DSM program participants change their energy and demand consumption after participating in a DSM program. Non-participants do not change their consumption in response to DSM programs, so no avoided costs or lost revenues are created by non-participants. Together, the avoided costs and lost revenues produce rate impacts which apply to all customers (participants and non-participants).

c) Changes in measure mix that do not affect the total rate class expenditure, savings, or participation rate have no effect on the RBIA results, since the RBIA examines effects at the rate class level, as opposed to the program, project, or measure level. Changes in rate class total expenditures, savings, or participation rates would potentially have an impact on the average rate and bill impacts. For example, holding everything else

NON-CONFIDENTIAL

equal, increasing total costs for a rate class would generally add upward rate pressure and create additional bill savings for participants; increasing savings would increase the participant bill savings and create additional avoided costs that add downward rate pressure; and increasing participation estimates would narrow the gap between average participant and non-participant bill impacts. Scaling programs up or down (changing savings, expenses, and participation in proportion) would generally produce little effect on estimated rate and bill impacts. EfficiencyOne notes that its historical RBIA, filed each October, relies on historical information and the actual mix of measures that was delivered.