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Request IR-1:

Pages 16 and 17 of the Application discuss customers taking service under the Renewable to Retail (RTR) Tariff in 2023. Lines 3 and 4 on page 17 state: "…the corresponding energy amounts have been subtracted from the forecast starting in 2024."

(a) Is NS Power prepared for any delay in customers moving to RTR?

(b) Is NS Power prepared for a stronger take-up of RTR service than the current forecast?

Response IR-1:

(a-b) Yes. Any forecast has, by nature, a level of uncertainty. Planning exercises such as the Integrated Resource Plan (IRP) include different load scenarios as part of their analysis and development of associated resource planning requirements. Managing near-term load forecast uncertainty is also one of the reasons that NS Power maintains a 20 percent firm capacity Planning Reserve Margin (PRM) over the forecast firm peak load.

Request IR-2:

In section 4.2 Weather Data on page 17 of the Application, the Heating Degree Day (HDD) uses a reference temperature of 18°C, below which NS Power expects customers will require heating for their home and above 18°C customers will require cooling in their home.

(a) Why is only one reference temperature used?

(b) Is there evidence supporting the use of 18°C? If so, please provide. If not, please explain why a different temperature was not applied.

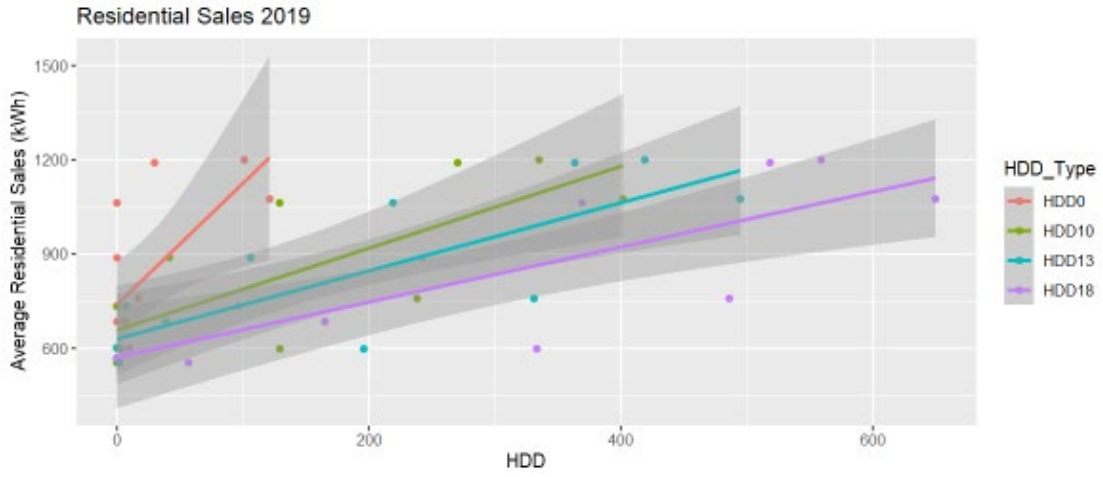
(c) Is there evidence to support the use of a single reference temperature over two or more reference temperatures? If so, please provide.

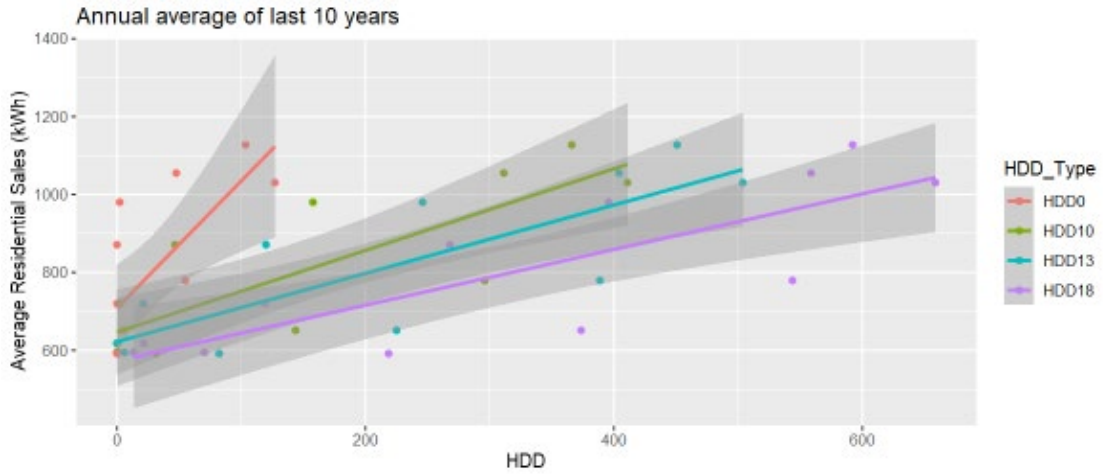
Response IR-2:

(a) Historically HDD18 has been used widely across Canadian utilities, and it is also aligned with Environment Canada and the US EIA where HDD65 is used as the Fahrenheit analogous equivalent.

(b) HDD18 is one of the most important linear components of the SAE model described in Appendix B. If all variables remain equal one can say that, in case of monthly residential sales, sales for the month are proportional to the monthly sum of HDD18.

The figures below show provincial examples of the relationship between different types of HDD and monthly average residential sales for the year 2019 (pre-COVID) and for annual averages of the last 10 years (period that informs the SAE model).





The figures above highlight two issues while modeling monthly residential sales as a linear regression of HDD:

(i) the reference HDDs, when HDD is small (daily average temperature near reference) tend to accumulate near the y-axis (sales), creating a loss of sensitivity for the SAE model, and

(ii) the model fit is better as the reference temperature increases (as shown by the width of the uncertainty band around the linear regression lines)

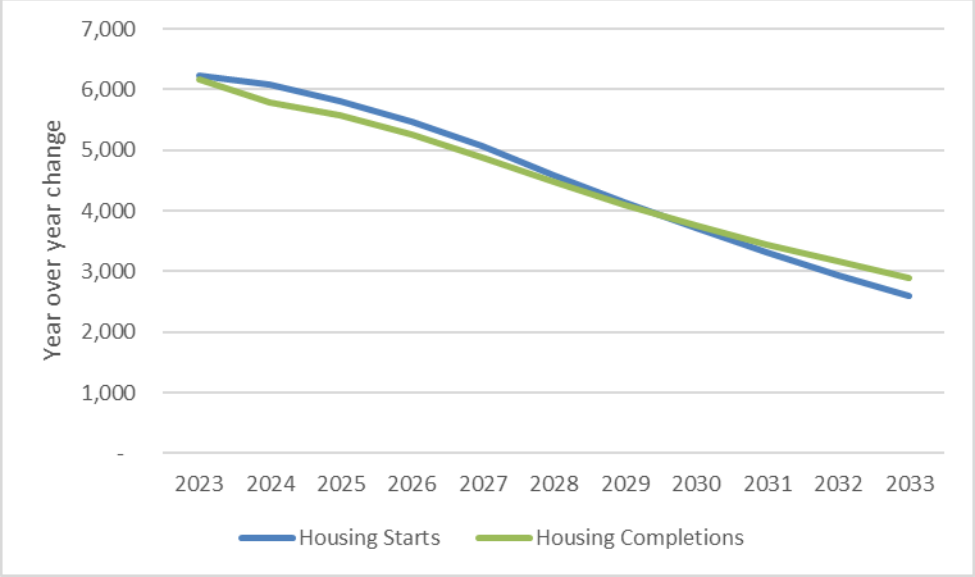
(c) In general, it is advisable to reduce the level of complexity (number of variables) when using regression models. If more than one HDD and CDD are introduced in the SAE model, it is possible to introduce more correlated variables as the original natural independent variable, temperature, would be part of more than two variables directly, introducing overlap.

Request IR-3:

In section 4.3 Economic Information on page 27, lines 16 to 17 of the Application state: "Housing completion numbers continue to be highly correlated with residential customer count…". Has the forecast for years beyond 2023 been examined against housing starts and under construction to adjust for potential outliers from forecast?

Response IR-3:

The forecast period for housing starts and completions (from Conference Board of Canada data) is shown in the following graph:



There are no obvious outliers in the forecast period. NS Power does not have a forecast for houses under construction.

Request IR-4:

In reference to Figures 17 to 19 on pages 29 to 31 of the Application:

(a) Page 28 of the Application notes that financial variables have been adjusted to constant dollars to eliminate inflation effects. Have all the variables back to 2013 been adjusted?

(b) Figure 17 Residential Economic Drivers provides the number of New Construction with a growth rate of 35.5% in 2023. Is this data provided by or verified with the Canadian Mortgage Housing Corporation?

(i) The figures for New Construction from 2013 onward have been revised from the 2022 Load Forecast report. Please explain why and describe how does this revised data effect the load forecast?

(c) Figure 17 provides Household Compensation which shows a decline in 2023.

(i) The figures for 2020 onward have been revised from the 2022 Load Forecast report. The 2022 report forecasted compensation in 2022 at 18,637 and 2023 at 18,747. This report forecasts compensation at higher levels, 19,174 for 2022 and 19,133 for 2023. Please explain why and describe how does this revised data effect the load forecast?

(ii) Is this data from the Conference Board of Canada long term forecast? Please provide justification for the decline in 2023.

a. If an explanation for the decline of household compensation in 2023 is not available, please confirm this forecast was checked against other Nova Scotia forecasts for 2023.

(d) Figure 18 Commercial Economic Drivers provides Non-Manufacturing GDP and Non-Manufacturing Employment with very small growth in 2023.

(i) The figures for Non-Manufacturing Employment from 2013 onward have been revised from the 2022 Load Forecast report. Notably, the 2022 forecast provided an employment high of 452,000 occurring in 2031 and 2032, whereas this forecast exceeds this figure for 2023 and onward. Please explain why and describe how does this revised data effect the load forecast?

(ii) Have the authors of this data provided a reason for the reduced growth in 2023 for GDP and for diminishing growth in manufacturing employment? If so, please provide a copy.

(iii) Has the data been checked against other forecasts?

(e) Figure 19: Industrial Economic Drivers provides the historical and forecast manufacturing GDP and employment both declining in 2023.

(i) The figures for Manufacturing GDP from 2019 onward have been revised from the 2022 Load Forecast report, similarly the Manufacturing Employment numbers from 2014 onwards have been revised from the 2022 Load Forecast report. Please explain why and describe how does this revised data effect the load forecast?

(ii) Have the authors of this data provided a reason for the negative growth in 2023? If so, please provide a copy.

(iii) Have the authors provided a reason for the negative employment growth in 2025 to 2027 against positive GDP growth? If so, please provide a copy.

a. Please explain the impact on the load forecast of the decline in manufacturing employment with positive manufacturing GDP growth.

(iv) Has the data been checked against other forecasts?

Response IR-4:

(a) Yes, indicators in dollars are adjusted for the historic period.

(b) New Construction data is provided by the Conference Board of Canada, who list the CMHC as one of their sources. NS Power is not aware of why the historic series changes, but the CMHC and Statistics Canada do revise the underlying historic data from time to time. New construction numbers are only used in the forecast period, so there is no impact from a change to the historic series.

(c)

(i-ii) Household Compensation data is provided by the Conference Board of Canada, which periodically updates its data. NS Power does not have visibility into the reasons behind the changes in the Conference Board of Canada data series. In general, increases to household compensation will increase the forecast consumption. Note that the forecast uses an indexed value for the household compensation variable, so it is the change from year to year rather than the absolute value that will impact the regression. NS Power does not have other forecasts for Nova Scotia household compensation with which to compare.

(d)

(i) Data regarding Non-Manufacturing Employment is provided by Statistics Canada. Statistics Canada announced a revision to their labour force survey data in January of 2023, the details provided on their website [1] are as follows:

Revised Labour Force Survey (LFS) data for the period from 1987 to 2022 are now available. The purpose of this revision is threefold:

- To align LFS data with the most recent version of the National Occupational Classification, as is done every five years;
- To introduce enhancements to the rules and parameters used in the editing and imputation of LFS data to take full advantage of data

[1] The Daily — Labour Force Survey: Revisions, 1987 to 2022 (statcan.gc.ca)

processing and information technology systems changes made in 2019; and

- To fine-tune the parameters used in the seasonal adjustment of LFS estimates, as is done every year.

These revisions ensure that survey estimates accurately reflect the Canadian labour market, while having minimal impact on the comparability of labour market indicators, such as employment, unemployment and participation rates, over time.

Future LFS releases—including the release of January 2023 data on February 10—will be aligned with these revised series.

Labour Force Survey historical revision has minimal impact on labour market trends.

Over the revision period, employment levels were revised upward slightly, averaging 0.5 percent (+91,000) from 2006 to 2022. There was minimal difference in the month-to-month and year-over-year change in employment. The upward revision in employment was distributed proportionally across all provinces.

Outside of larger changes during the early part of the COVID-19 pandemic from March to May 2020, the unemployment rate changed by a maximum of 0.2 percentage points during the revision period. The revised national unemployment rate in December 2022 was unchanged from the unrevised rate at 5.0 percent.

Revised average hourly wages were 2.6 percent higher than unrevised wages over the period from January 2006 to December 2022. After the initial upward

revision to wage estimates in 2006, trends in year-over-year wage growth among employees were equivalent on average in the revised and unrevised wage series. In December 2022, revised average hourly wages grew 4.8% (+$1.49 to $32.67) year over year, slightly less than the unrevised year-over-year increase of 5.1 percent (+$1.57 to $32.06).

Note that the last point may be a contributing factor to the change in household compensation discussed in part (c). Like household compensation, in general increases to employment numbers will increase the forecast consumption. The forecast uses an indexed value for the employment variable, so it is the change from year to year rather than the absolute value that will impact the regression.

(ii) No data for the forecast variables is provided by the Conference Board of Canada.

(iii) GDP and employment forecasts for 2023 and 2024 provided by Canadian banks for Nova Scotia are compared to the forecast of the Conference Board. The bank forecasts are provided in Synapse IR-05, and the table below shows the bank averages compared to the Conference Board.

	GDP		**Employment**	
	2023	2024	2023	2024
Bank Average	0.9	1.1	0.5	0.7
CBoC	0.4	2.1	0.6	0.9

The bank forecasts were from November 2022 through January 2023, with most dating from December 2022, so it was felt that the more recent Conference Board forecast (from February 2023) would be more appropriate and therefore no adjustments were made.

(e)

(i) The Conference Board of Canada provides data regarding manufacturing GDP, which periodically updates its data. No explanation was provided for the change in GDP. For the employment numbers please refer to the explanation provided in response to part (d).

(ii) No reason for the negative growth was provided by the Conference Board of Canada.

(iii) No reason was provided by the Conference Board of Canada. Each of the small and medium industrial forecasts uses only one of the economic variables, so the impact to the small industrial forecast (which uses GDP) would be an increase while the impact to the medium industrial forecast (which uses employment) would be a decrease.

(iv) Please refer to part (d) (iii) above.

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Request IR-5:

Page 33 of the Application lines 5 to 6 state: "The end-use model uses an estimated saturation of 40 percent of customers supplying their heat via heat pumps in 2023." In the 2021 and 2022 Load Forecast report, the model used a saturation of 33 percent (Exhibit N-1 M10109, Exhibit N-1 M10569). Please explain the reasons for increasing the saturation in the end-use model for heat pump heating and provide justification for increasing from 33% to 40%.

Response IR-5:

The 2022 report cited an estimated saturation of 35 percent in 2022 (lines 3-4 on page 36 of the report) and had a forecast of 38 percent for 2023. With higher than forecast installations of heat pumps in 2022 (outlined on line 7 of page 33 of the 2023 report), the 2023 estimate has been increased to 40 percent.

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Request IR-6:

Page 37 of the Application addresses heat pump water heaters, lines 11 and 12 state: "Growth is expected to remain steady, with saturation increasing to 87 percent by 2033."

(a) When will the existing financial incentives/rebates for installing heat pumps end?

(i) Has this been accounted for in the forecast?

(b) How effective are heat pump water heaters at providing both hot water for consumption while simultaneously providing hot water for space heating, particularly in cold climates?

Response IR-6:

(a) The lines cited above refer to regular electric hot water tanks, not heat pump hot water heaters. Heat pump hot water heaters are not explicitly included in the forecast, but the forecast does assume increasing efficiency of hot water heaters. There are no specific assumptions around the end of incentives for heat pumps or heat pump hot water heaters, but the forecast does assume a full transition to heat pump space heating by 2050 in order to achieve carbon reduction targets regardless of available incentives.

(b) NS Power is not aware of any commonly available heat pumps that can provide both domestic hot water and space heating simultaneously.

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Request IR-7:

Page 38 of the Application, lines 12 to 13 state: "It is estimated that there were approximately 1900 EVs in the province as of the end of 2022."

(a) Has this estimate been checked against the Nova Scotia government Open Data for EV registration and/or EV rebate data?

(b) Is the forecast based on a combination of historical/actual EV adoption and government targets? If not, why not?

Response IR-7:

(a) Yes. The estimate is based on Nova Scotia EV registration open data that was updated on February 6, 2023 with a total of 1922 EVs as of January 1, 2023.

(b) Yes. The model used historical EV adoption in Nova Scotia and an expected growth rate of 0.5 percent from 2022 to 2035 for forecasting new vehicle sales. The federally mandated new sales targets for EVs of 20 percent in 2026, 60 percent in 2030 and 100 percent in 2035 were applied to the yearly totals for new vehicle sales in those years.

Request IR-8:

Page 41 of the Application indicates that bi-directional chargers have been installed at non-residential locations.

(a) How many have been installed in 2022?

(b) How many are forecast to be installed in 2023?

(c) How many are forecast to be installed in residential locations in 2023?

Response IR-8:

(a) As part of the Smart Grid Nova Scotia (SGNS) project (CI C0010788), two bi-directional chargers have been installed (one in 2021 and one in 2022).

(b) One previously installed unit will be upgraded in 2023 and a new install at another non-residential location is forecast under the SGNS project.

(c) There are no forecast bi-directional charger installs outside the SGNS project.

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Request IR-9:

Page 53 of the Application lines 1 to 2 state "The SAE models are estimated using a -0.15 price elasticity."

(a) Is this a short-run or long-run price elasticity?

(b) With increasing electrification in Nova Scotia, how is this elasticity forecast to change between 2023 and 2033?

(c) Have any estimates of price elasticity been calculated for each of the rate classes? If not, why not?

Response IR-9:

(a) The elasticity is short run. It is applied to the HeatUse, CoolUse and OtherUse variables, which represent changes in consumption behaviour in response to year-over-year price changes. Long-term changes to energy consumption are driven by end use saturations and efficiencies.

(b) The elasticity is forecast to remain constant over the forecast period.

(c) No, they all use the same elasticity. There has been no indication in the model results that revision to the elasticities is required.

Request IR-10:

Page 53 of the Application indicates that the price elasticity in the SAE model was developed by Itron with other utilities.

(a) Did Itron work with any Canadian utilities to estimate this elasticity? If not, what makes this a reasonable elasticity for Nova Scotia?

(b) Did the utilities that Itron worked with to develop this elasticity only peak in the winter months like NS Power? If not, please explain why this is a reasonable elasticity for Nova Scotia.

(c) Did the utilities that Itron worked with to develop this elasticity have similar weather patterns and daylight hours during peak as Nova Scotia? If not, please explain why this is a reasonable elasticity for Nova Scotia.

(d) Did the utilities that Itron worked with to develop this elasticity have any competition? If so, please explain why this is a reasonable elasticity for NS Power.

(e) Did the utilities that Itron worked with to develop this elasticity have the same level of electrification as in Nova Scotia? If not, please explain why this is a reasonable elasticity for NS Power.

Response IR-10:

(a-e) As indicated in the report, the elasticity is estimated based on Itron's experience across a wide range of utilities in Canada, the US and in both summer and winter-peaking jurisdictions. NS Power does not have information on the specifics of the development of this elasticity but relies on Itron's experience in energy forecasting. To put the impact of the price elasticity into perspective, the following table shows the estimated impact to sales in 2033 for various estimates of price elasticity:

Elasticity	**Change in Residential Sales (GWh)**
-0.05	1
-0.15 (current estimate)	0
-0.25	-1
-0.50	-3
-0.75	-4

With larger changes in price the elasticity would have a bigger impact, but compared to the other variables in the regression, the impact of a change in the elasticity is minor.

For a detailed example, please refer to CA IR-10 to see how the elasticities enter the SAE model equations in the residential sector.

Request IR-11:

With reference to Attachment 5 Residential Model Inputs & Outputs:

(a) Under the inputs tab in the column WtXHeat, the values in July are higher than for WtXCool. Please explain why heating has a higher value than cooling in July.

(b) Under the inputs and outputs tabs in the column WtXHeat, the values in July are higher than October. Please explain.

(c) Under the inputs and outputs tabs in column WtXCool there are values for November and December in many years that are higher in those months than June. Please explain why there are values for cooling in November and December and why the values are higher than June.

(d) In the outputs tab July has higher values for WtXHeat than for WtXCool. Please explain.

Response IR-11:

(a-c) The monthly totals in Attachment 5 do not reflect actual monthly forecast amounts. The granularity of the inputs is not detailed enough to estimate these quantities accurately, particularly when comparing heating and cooling components. As shown in The Residential Model Detail section of Appendix B, the XHeat and XCool variables (billed sales analogues of the accrued WtHeat and WtCool) are made up from multiplying HeatUse/CoolUse and HeatIndex/CoolIndex. While HeatUse/CoolUse have as inputs monthly weather, the HeatIndex/CoolIndex variables, which are related to end-use information extracted from both NRCan and EIA, have annual inputs that are divided by 12 to estimate their monthly contributions, as this is the only way to shape the annual amounts into monthly amounts. In the case of July values of WtXHeat being higher that

WtXCool, it is due to the imperfect translation of annual values to monthly amounts combined with the fact that the heating variable is a factor of 10 higher than the cooling variable, so any residual amounts may be larger in heating. The same is true when comparing July WtXHeat to October WtXHeat inputs, the allocation across months is limited by the other inputs. Directionally, XHeat decreases as XCool increases during the summer months, and in terms of load forecast accuracy and planning, it is the annual values that determine the output.

(d) The outputs reflect a better monthly estimate than inputs, as the SAE model uses monthly weather information, monthly estimates of annual economic and end-use information to adjust based on actual monthly billing information. The difference between months within WtXCool, and months within WtXHeat, are due to lagged weights that are used to allocate heating/cooling usage to the three months (including the actual) that lead into the actual (bi-monthly) billing cycle. In the left-hand side of the equation for the SAE Residential model, the input information given to the model is the average of *billed* sales, which in turn follows a bi-monthly billing cycle in the case of the residential class. To allocate the right amount of cooling/heating for a given month of billed sales, the two prior months ($XCool_{-2}$, $XCool_{-1}$), and the current one (XCool) are added using a weighted sum approach, where[1] $WtXCool=0.23*XCool+0.51*XCool_{-1}+0.26*XCool_{-2}$. This split creates a lag in the WtXCool/WtXHeat variables, shifting a portion of cooling/heating impacts by approximately two months.

[1] The same weights are used for WtXHeat.

Request IR-12:

Page 59 of the Application states in lines 5 to 7 "Building efficiency is expected to improve, although based on calibration done in 2013, improvements are expected to be lower in Nova Scotia than in the EIA forecast for New England." At 10 years, old this report is out of date. Have other resources been evaluated for NS Power to obtain similar, but up-to-date, information for modeling?

Response IR-12:

NS Power is unaware of any Nova Scotia specific building shell efficiency data, other than EIA-derived data sets.

Request IR-13:

Figure 42: Residential Sales Components by Year on page 60 of the Application project 54 GWh for New Customers in 2023 and 106 GWh for 2024. In the 2022 Load Forecast the New Customer forecast was 56 GWh for 2022 and 92 GWh for 2023. The 2021 Load Forecast the New Customer forecast was 44 GWh for 2021, 77 GWh for 2022 and 106 GWH for 2023. It appears that the forecast for New Customers is overstated in the near term. Please explain and provide justification for the forecasted growth.

Response IR-13:

The amounts for New Customers referenced above are cumulative, so the amounts given for the first year would be included in the amounts for the second year (since the second year will have the total new customers for both years). The forecast sales are driven by new customer count. A breakdown of the incremental amounts and customers counts are provided in the following table:

	2021	**2022**	**2023**	**2024**
2021 Forecast GWh (cumulative)	44	77	106	
2021 Forecast GWh (incremental)	44	33	29	
2021 Forecast New Customers (incremental)	4760	3875	3523	
2022 Forecast GWh (cumulative)		56	92	
2022 Forecast GWh (incremental)		56	36	
2022 Forecast New Customers (incremental)		4270	3935	
2023 Forecast GWh (cumulative)			54	106
2023 Forecast GWh (incremental)			54	52
2023 Forecast New Customers (incremental)			6057	6023

Request IR-14:

Page 62 of the Application states in lines 26 to 28, "Approximately 35 percent of the energy for EVs is allocated to the commercial class, while approximately 30 percent of the peak is allocated to the commercial class." Please elaborate on why the allocations for energy and peak are appropriate; please cite external support were possible.

Response IR-14:

Allocations are based on the data provided by E3 in their EV energy and peak forecast, which breaks out residential charging by location (home, work and public) and assumes charging of medium (delivery vehicles) and heavy-duty (buses) vehicles fall under the commercial class.

Request IR-15:

Page 63 of the Application presents the forecast for Commercial Class sales and identifies that sales lag the rebound in economic variables. Please explain if there has been any consideration given to a potential for an economic downturn or recession from quantitative tightening, and if not, why not.

Response IR-15:

There is no specific consideration for an economic downturn (recession), as it is not possible to predict if or when such an event will occur. Overall changes to the underlying economy (including the impacts of any quantitative tightening assumed by the Conference Board's forecast) are taken into account through the economic variables used in the models.

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Request IR-16:

Page 63 of the Application indicates that a COVID variable was added to the General rate class model to account for the drop in sales.

(a) Please explain how this variable is formulated and how long it will be applied to the model.

(b) Has any consideration been given to the possibility that the relationship between commercial sales and GDP and/or employment may be changing?

Response IR-16:

(a) Like the residential class equivalent, the variable is a pseudo-binary of 1 starting in March 2020, 0.75 in September 2021, 0.38 in June 2022 and 0.19 in January 2023-2033. While the variable for the residential class adds load (the coefficient is positive), the variable in the commercial class reduces load (the coefficient is negative). The statistical significance of the variable will be re-evaluated for next year's forecast.

(b) Not specifically for this forecast, but a breakdown between an economic variable and class sales is always a possibility and is monitored through changes in the statistical significance of the model inputs as well as the results of the model itself.

Request IR-17:

Page 65 of the Application states in line 13 "the addition of EV loads adds 272 GWh by 2023…." Please explain how the EV load has been verified.

Response IR-17:

Line 13 on page 65 refers to 272 GWh by 2033 in the General class and is based on energy consumption data provided by E3, which is based on aggregated data at the provincial level. As more data is gathered on EV use in Nova Scotia it will be incorporated into the estimates used in the forecast.

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Request IR-18:

Page 67 of the Application indicates that Large General Service growth is driven by several hospital projects. This was cited in the 2022 Load Forecast to have a strong effect.

(a) Does NS Power have confidence in these projects taking place in 2023?

(b) Does the long-term portion of the load forecast account for sustained higher annual consumption from these projects?

(i) Have the customers identified any DSM or other energy mitigation investments to their infrastructure, like solar panels?

Response IR-18:

(a) No, in the forecast the load associated with the provincial health authority construction is expected to increase starting in 2024 with most of the increase forecast for 2025-2027.

(b) The long-term forecast does account for sustained consumption from these projects. Load associated with new projects, particularly those forecast for several years into the future, is estimated at a very high level, and details about specific energy savings infrastructure is not taken into account explicitly.

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Request IR-19:

Page 68 of the Application states that Small Industrial sales "have been flat for the last 10 years and are expected to grow at 1.0 percent annually over the forecast period due to underlying economic growth." Is the underlying economic growth weighted or is the GDP growth directional for sales?

Response IR-19:

GDP is used directly in the model and is not weighted, but the regression does produce a coefficient for the variable (2.156 as shown in Appendix B).

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Request IR-20:

Page 69 of the Application indicates that Medium Industrial sales are forecast to fall leading to "an average decline of 0.7 percent."

(a) Are there other metrics that support this decline, such as employment?

(b) The graph in Figure 50 is flat after 2024, is the forecast decline simply the loss of load to RTR or is it also a reflection of other forecasted factors?

Response IR-20:

(a-b) The decline is due to the loss of load to RTR. Employment is expected to remain stable over the forecast period.

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Request IR-21:

Figure 51: New Large Industrial Projects forecast.

(a) What is the confidence in this forecast level of new project energy requirements?

(b) Have high and lows been estimated?

Have any DSM or other energy mitigation measures been incorporated?

Response IR-21:

(a) Projects in the near term are more likely to occur than those in later years, but none are certain. To account for diminishing certainty for projects in later years, factors are applied to the load associated with new projects to reflect that they become more uncertain as they move further into the future. These start at 65 percent for projects in 2023 and decrease to 10 percent by 2027.

(b) No highs or lows have been estimated.

DSM is applied at the class level and is not estimated for specific projects.

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Request IR-22:

Figure 53 of the Application indicates that under the Residential Class, 263 GWh are the result of an unexplained variance from the 2022 forecast. This is a significant increase from the 2022 report when the unexplained variance was 42 GWh and from the 2021 report, when the unexplained variance was 26 GWh. Given the significant size of this unexplained variance, what factors have been explored to determine the cause?

Response IR-22:

The main factors that contribute to the unexplained variance in the residential class include a higher number of heat pumps installed in 2022 than forecast, and higher work from home activity than forecast. The 2022 forecast estimated that the impact from COVID/work from home would diminish throughout the year, but the higher load indicates that activity persisted at similar levels to 2021.

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Request IR-23:

Page 74 of the Application states "From 2023 to 2033, NSR is forecast to increase at an average of 0.7 percent per year…". This is an increase from previous forecasts. Please explain what this forecast accounts for that previous forecasts have not.

Response IR-23:

The forecast components and inputs are all similar to previous forecasts, nothing has been added that wasn't also in previous forecasts. Changes from year-to-year result from updating those inputs and the output of the regression models in response to actual sales in the prior year. The report provides details of the underlying changes for each class as well as class level comparisons to the previous forecast. As outlined on page 74 of the report, the main drivers for the increase are higher customer growth, increased space heating, and a higher EV sales forecast that incorporates federal sales mandates. A breakdown of the significant contributors is provided in Figure 55.

Request IR-24:

Figure 55: Forecast Components on page 76 of the Application allocates 224 GWh for the residential forecast to Model contributing to a NSR of 446 GWh. This is a significant increase from the previous forecasts that allocated 60 GWh to the residential component for a total of 226 GWh for NSR. Please explain the increase.

Response IR-24:

The contribution from the underlying components of the model can be found in Appendix B starting on page 5 for the Residential class. The Regression table shows that the growth over the 10-year timeframe is driven mostly by the heating variable, which are a direct result of the increase in the heat pump forecast (see the XHeat tables for a breakdown of the heating types). In the 2022 forecast, the heating variable actually showed a small decline due to the decrease in electric baseboard. The following table summarizes the 10 year change of various contributors for the two forecasts:

Variable	2023 Forecast 10 year Change	2022 Forecast 10 year Change
XHeat	3.3%	-0.4%
XCool	2.1%	1.6%
XOther	-0.7%	0.9%
Efurn	-18.6%	-26.0%
HP Heat	26.8%	23.9%

Request IR-25:

Page 8 of 8 of Appendix D Forecast Sensitivity Analysis, NS Power states "Other scenarios include the potential development of large-scale hydrogen production in the province. At this time, the effects on the Net System Requirement and System Peak are not sufficiently developed to be included in the load forecast. NS Power will continue to monitor the development of this new sector in future Load Forecast Reports."

(a) What further information, that the company does not currently have, does NS Power require before it can incorporate the development of large-scale hydrogen in the load forecast?

(b) Given the legislative regime related to green hydrogen is now in place, and EverWind Fuels has made public statements about striving to be in production by 2025, could NS Power's inability to address hydrogen in the 2023 Load Forecast Report impact its ability to meet potentially growing energy needs?

Will green hydrogen scenarios be developed as part of the IRP Evergreen process?

Response IR-25:

(a-b) NS Power is continuing to work with government and industry proponents to understand their plans and requirements for electricity service from NS Power. Important components of the requirements such as size of the customer load and load profiles, load flexibility, sources of self supply and the impact on the production facility net firm/non-firm renewable requirements, which impact the load forecast, are expected to become clearer over the coming year and will, as appropriate, be reflected in the next load forecast.

NS Power is taking steps to understand these requirements in support of the development of the industry, while serving the long-term interests of NS Power's other customers.

As one of the initial steps, NS Power included three generic domestic hydrogen scenarios in the Evergreen IRP modeling, one with the Atlantic Loop and two without. These scenarios indicate that additional renewable and firm resources would be required in the province to serve the modeled hydrogen facilities with 100 percent renewable electricity. As specific system requirements are better understood by the project developers, the NS Power System Planning Team will complete additional resource modeling to assess the potential load impacts and the balance of energy and capacity requirements to meet the net demand of hydrogen facilities.

Request IR-26:

In reference to matter M11084 PLT Staffing Levels and Reliability of Service 2023 Report, Exhibit N-2, IR-1 requested the sources of the increase in hours for customer driven work. In response, NS Power provided in lines 13 to 14 "There has been an increase in new customer connections, upgrades to existing services due to customers increase load…".

(a) Does NS Power know, or have an estimate of, the size of electrical panels in customers' homes and businesses?

(b) Does NS Power have a forecast for upgrades to existing services to accommodate increased electrification by customer class? If so, please provide.

(i) If not, why not?

(c) With increasing electrification, customers will demand higher load. Does the Sensitivity Analysis for Distribution of Energy 90th percentile capture such an increase in demand before DSM?

(i) If so, how many customers, by customer class, will need to upgrade their existing services, and to what level of service, to reach the 90th percentile?

Response IR-26:

(a) No, customer panel size is not known unless a customer upgrades their service.

(b) Customer service work is forecast at the aggregate level only. Service upgrade orders are recorded and are provided in the following table for the years 2019 – 2022 with the 2023 forecast:

Year	**Number of Customer Upgrade Orders**
2019A	1698
2020A	1860
2021A	2502
2022A	2937
2023F	3113

(c) The sensitivity analysis provided in Section 11 only accounts for weather and economics. The peak forecast does take the expected electrification demand impacts into account, but does not look at the corresponding potential impact on customer panel size.