Newfoundland and Labrador Hydro
Hydro Place. 500 Columbus Drive
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 I f. 709.737.1800
nlhydro.com

November 5, 2025

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Jo-Anne Galarneau
Executive Director and Board Secretary

Re: *Reliability and Resource Adequacy Study Review* – 2025 Island Interconnected System Load Forecast Report

Please find enclosed Newfoundland and Labrador Hydro's ("Hydro") 2025 Island Interconnected System Load Forecast Report, provided in accordance with the Settlement Agreement[1] from the *Reliability and Resource Adequacy Study Review* proceeding.

Hydro's load forecast methodology reflects standard industry approaches for assessing potential growth. Within the 2024 Resource Adequacy Plan proceeding, the parties agreed that the load forecast methodology used by Hydro in the 2023 Load Forecast is consistent with utility industry standards; the 2025 Load Forecast utilizes the same methodology.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/kd

Encl.

ecc:

Board of Commissioners of Public Utilities
Jacqui H. Glynn
Ryan Oake
Board General

Labrador Interconnected Group
Senwung F. Luk, Olthuis Kleer Townshend LLP
Nicholas E. Kennedy, Olthuis Kleer Townshend LLP

Newfoundland Power Inc.
Dominic J. Foley
Douglas W. Wright
Regulatory Email

Island Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Glen G. Seaborn, Poole Althouse

Consumer Advocate
Dennis M. Browne, KC, Browne Fitzgerald Morgan & Avis
Stephen F. Fitzgerald, KC, Browne Fitzgerald Morgan & Avis
Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Bernice Bailey, Browne Fitzgerald Morgan & Avis

[1] "2025 Build Application – Bay d'Espoir Unit 8 and Avalon Combustion Turbine," Newfoundland and Labrador Hydro, March 21, 2025, sch. 2.

2025 Island Interconnected System Load Forecast Report

Executive Summary

Newfoundland and Labrador Hydro ("Hydro") annually develops a Reference Case forecast of firm electric power demand and energy requirements to assess the impacts of customer, demographic, and economic factors on the future provincial electricity load requirements. The resultant load forecast is a critical primary input to Hydro's overall planning, budgeting, and operating activities. The 2025 Load Forecast was produced in the third quarter of 2025; it covers the period from 2026 through 2036.

Overall, the 2025 Load Forecast is showing growth across the provincial system stemming from several factors, including:

- The recent increase in population and related home construction, as indicated by the Government of Newfoundland and Labrador ("Government") forecasts; and
- Ongoing electrification[1] activities, primarily resulting from actions taken by the provincial and federal governments to mitigate climate change; and projected electric vehicle ("EV") adoption rates, where possible data on these rates is provided through expert input from third parties such as Dunsky Energy + Climate Advisors ("Dunsky").

Overall, this report demonstrates that there is an immaterial difference between the compound annual growth rate ("CAGR") between the 2024 and 2025 Load Forecasts. As a result, there is no impact to Hydro's recommended Minimum Investment Required Expansion Plan or the resource supply options proposed in the 2025 Build Application[2] currently before the Board of Commissioners of Public Utilities ("Board").

Hydro previously engaged Daymark Energy Advisors ("Daymark") to provide a third-party independent assessment of the strength of Hydro's load forecasting process, including a review of the underlying methodologies used to produce the 2023 Load Forecast and the accuracy of Hydro's historical forecasts.[3] Industry changes, as well as policy changes in response to concerns about climate change, have accelerated compared to what has been seen in recent years, and there remains uncertainty

[1] Electrification is decarbonization that results in replacing processes or technologies that use fossil fuels with an electrically powered equivalent.
[2] "2025 Build Application – Bay d'Espoir Unit 8 and Avalon Combustion Turbine," Newfoundland and Labrador Hydro, March 21, 2025.
[3] "Long-Term Load Forecast Report – 2023," Newfoundland and Labrador Hydro, March 28, 2024.

regarding timing and adoption rates for new technology. This uncertainty is captured by developing alternate forecast scenarios.

As the time horizon in any forecast increases, the level of error is expected to increase, which supports Hydro's use of alternative scenarios to support system planning assessments.

All forecasts have inherent uncertainty. As a rule, in any utility, system-planning activities require consideration of a broad range of potential future outcomes to reflect uncertainty in the load forecast model input data and the relationships estimated in the model. This enables sound decision-making by demonstrating the resiliency of plans against a range of input considerations, allowing for increased certainty when making recommendations. From a load forecast perspective, this process requires the establishment of an appropriate Reference Case. The Reference Case reflects the expected or most likely future scenario based on current information, as well as the analysis of several scenarios, which captures the breadth of potential future outcomes, highlighting the sensitivity of the load forecast to changes in key drivers.

To reflect the potential for variability in the model input data and the relationships estimated in the load forecast, Hydro develops scenarios to capture a broad variation from the Reference Case. Developed scenarios tend to focus on possible alternative future outcomes for macroeconomic drivers of the load forecast and government policies. Examples can include electrification, such as EV adoption, population growth, and industrial expansion or contraction. By developing alternative scenarios, Hydro can assess the sensitivity of its expectations with respect to demand and energy requirements to changes in macroeconomic conditions and validate the robustness of its resource planning activities against the same. This methodology enables Hydro to better manage the inherent uncertainty in forecasting demand and energy requirements during a period of significant industry change that could impact resource planning analyses.

Although a range of load forecasts were developed independently for the Island Interconnected System and the Labrador Interconnected System, for this report, Hydro has only included the Island Interconnected System load forecast as it relates to the long-term planning of the Island Interconnected System. Consistent with the forecasts used in the 2025 Build Application, three forecasts were developed to reflect the range of forecasted Island Interconnected System load requirements, as summarized in Figure 1.

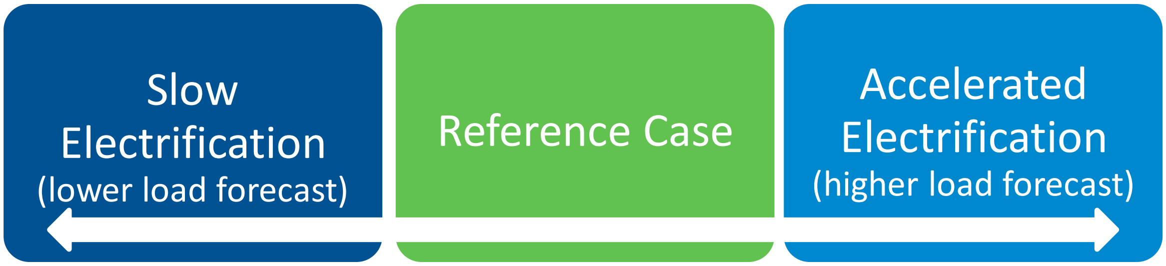

Figure 1: Island Interconnected System Forecast Scenarios[4]

- **Slow Electrification Path Scenario ("Slow Electrification"):** Considers more moderate electrification efforts of the transportation sector, slightly higher electricity rates and lower housing starts, and minimally less industrial demand, resulting in a lower load forecast as compared to the Reference Case;
- **Reference Case:** Based upon the continuation of a steady level of decarbonization, driven primarily through government policy and programs, and anticipated electrification of the transportation sector. Also included is a near-term increase in housing starts, with population moving from near-term stability to a natural decline; and
- **Accelerated Electrification Path Scenario ("Accelerated Electrification"):** Assumes accelerated electrification of the transportation sector and increased electrification of Government buildings. Population, housing starts, and economic indicators are higher than the Reference Case, and an increase in industrial demand is modelled. This results in a higher load forecast as compared to the Reference Case.

Hydro's recommended Expansion Plan within the 2024 Resource Adequacy Plan,[5] referred to as the Minimum Investment Required Expansion Plan, includes the Slow Decarbonization load forecast. The capacity resource options identified in the Minimum Investment Required Expansion Plan, Bay d'Espoir Unit 8 and the Avalon Combustion Turbine, have both been put forth in the 2025 Build Application. All three load forecast scenarios consider the required expansion plan costs in the forecasted electricity price. While the 2024 Resource Adequacy Plan recommends building for the Slow Decarbonization load

[4] Hydro previously referred to the "Slow Electrification" and "Accelerated Electrification" scenarios as "Slow Decarbonization" and "Accelerated Decarbonization." The naming convention has changed in the 2025 Load Forecast report to reflect that the primary driver of load growth in the 2025 Load Forecast is transportation electrification.

[5] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024).

forecast, the most likely forecast scenario remains the Reference Case load forecast. The next Resource Adequacy Plan will include a recommended expansion plan to meet the Reference Case load forecast. As a result, this report will focus primarily on the Slow Electrification and Reference Case load forecast scenarios.

Chart 1 compares the 2025 Slow Electrification and the 2024 Slow Decarbonization and Reference Case load forecast scenarios.[6]

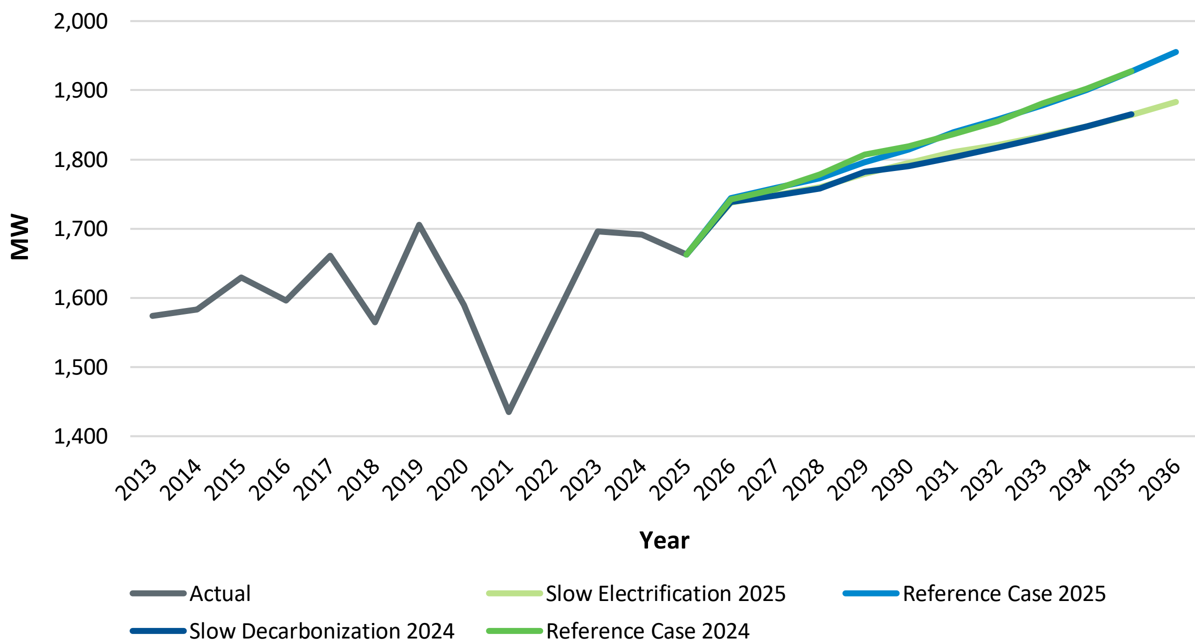

Chart 1: Island Interconnected System Annual Customer Coincident Demand Requirements Comparisons[7,8,9]

The 2025 Reference Case load forecast reflects the continuation of provincial government policies, incentives, and programs for decarbonization and electrification. The province continues to see economic growth, an increase in housing starts, a stable population, consistent conversions from oil to

[6] 2025 Actual Peak is year-to-date.
[7] The Island Interconnected System annual customer coincident demand is reflective of the total Island Interconnected System demand less transmission losses and station service load.
[8] Historical values are not weather-normalized.
[9] The significant decline in demand in 2020 and 2021 was due to the effects of the COVID-19 pandemic.

electric, and an increase but steady adoption of EVs. Industrial load is steady and includes a near-term ramp-up of mining operations and the uncertainty of the global marketplace for Industrial customers.

The 2025 Slow Electrification load forecast scenario also reflects stability in Government incentives and policies for decarbonization. This scenario considers lower housing starts compared to the Reference Case load forecast. This scenario also reflects a slower decarbonization impact, lower oil-to-electric conversions, and a slower adoption rate of EVs, which are well below the current federal targets.[10] There is a minimal decrease in industrial activity compared to the Reference Case.

The resulting interconnected customer electricity demand requirements developed for the Island Interconnected System are presented in Chart 2.

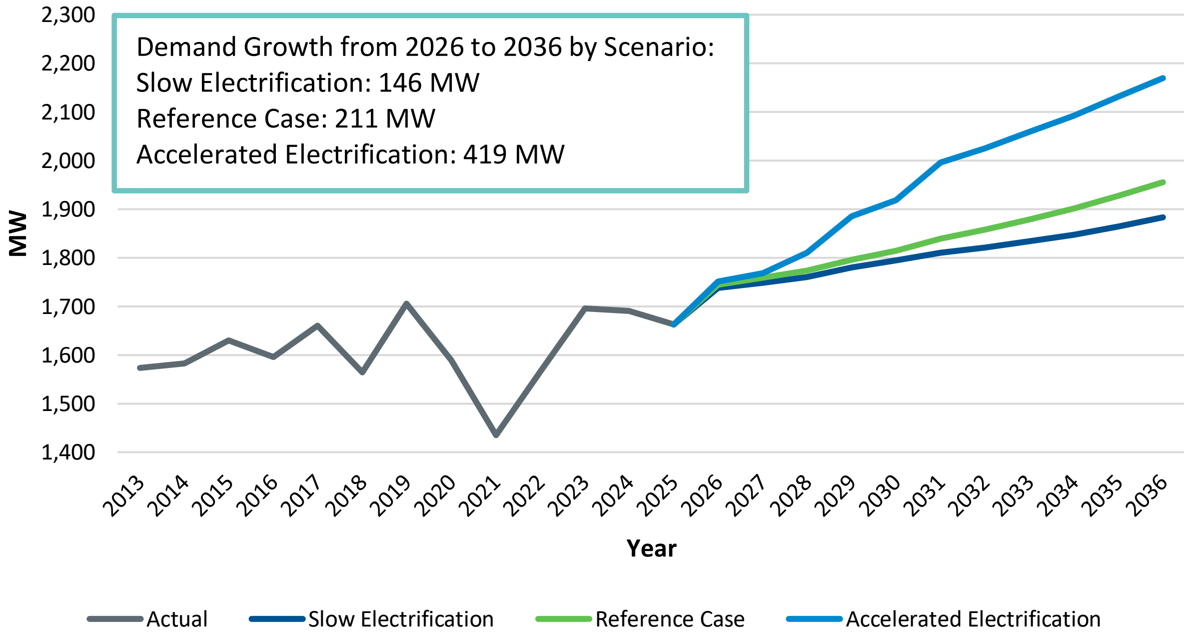

Chart 2: Island Interconnected System Annual Customer Coincident Demand Requirements[11,12,13,14]

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[10] The federal government has paused EV targets for 2026 while it completes a review of the Electric Vehicle Availability Standard ("EVAS"). Carolyn Gruske, *Canada pauses EV sales mandate for 2026*, *Electric Autonomy*, September 6, 2025. https://electricautonomy.ca/policy-regulations/2025-09-06/canada-ev-sales-mandate-2026-pause/.

[11] The Island Interconnected System annual customer coincident demand is reflective of the total Island Interconnected System demand less transmission losses and station service load.

[12] Historical values are not weather-normalized.

[13] The significant decline in demand in 2020 and 2021 was due to the effects of the COVID-19 pandemic.

[14] 2025 Peak is year-to-date.

The results of the three 2025 long-term planning forecast scenarios for the Island Interconnected System project overall load growth for the Island in every scenario across the forecast horizon. The CAGR[15] ranges from 0.8% in the Slow Electrification scenario to 2.2% in the Accelerated Electrification scenario. This is compared to the 2024 Island Interconnected System Forecast, in which the CAGR ranged from 0.9% in the Slow Decarbonization scenario to 2.1% in the Accelerated Decarbonization scenario. Therefore, there is an immaterial difference between the CAGR in the 2024 and 2025 Load Forecasts.

Table 1 details the demand forecast for each of the three scenarios, the year-over-year change, as well as the CAGR.

Table 1: 2025 Load Forecast Scenario Demands

Year	Slow Electrification (MW)	Y/Y Change (%)	Reference Case (MW)	Y/Y Change (%)	Accelerated Electrification (MW)	Y/Y Change (%)
2026	1,738	-	1,744	-	1,751	-
2027	1,749	0.7	1,759	0.9	1,769	1.0
2028	1,760	0.6	1,773	0.8	1,810	2.3
2029	1,779	1.1	1,796	1.3	1,885	4.1
2030	1,795	0.9	1,814	1.0	1,918	1.7
2031	1,810	0.9	1,839	1.4	1,996	4.1
2032	1,821	0.6	1,858	1.0	2,025	1.5
2033	1,834	0.7	1,878	1.1	2,059	1.7
2034	1,848	0.7	1,901	1.2	2,092	1.6
2035	1,865	0.9	1,927	1.4	2,132	1.9
2036	1,883	1.0	1,955	1.5	2,170	1.8
CAGR (%)	**0.8**	**-**	**1.1**	**-**	**2.2**	**-**

In summary, the 2025 Load Forecast is not materially different from the 2024 Load Forecast for both the Slow Electrification and Reference Case. As a result, the 2025 Load Forecast continues to support the Minimum Investment Required Expansion Plan as recommended by Hydro within its 2024 Resource Adequacy Plan, and the construction and installation of the Avalon Combustion Turbine and Bay d’Espoir Unit 8 as proposed in the 2025 Build Application currently before the Board.

[15] The CAGR’s are based on the forecast load increases from 2026 to 2036.

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Attachment 1: Supporting Tables

Attachment 2: "NL EV Adoption and Impacts Study – Final Results," Dunsky Energy + Climate Advisors, April 2, 2024

1.0 Introduction

Each year, Hydro generates independent load forecasts for the Island and Labrador Interconnected Systems. These forecasts are then used company-wide as the basis for many of Hydro's key business activities, including general rate applications, financial budgeting and forecasting, transmission planning analyses, rate analyses, long-term financial planning, and reliability and resource adequacy assessments.[16]

Hydro is filing the 2025 Island Interconnected System Load Forecast Report, which will inform the next Reliability and Resource Adequacy Study to reflect the most recent view of inputs and economic conditions for the province of Newfoundland and Labrador and to confirm that there is minimal change compared to the 2024 Island Interconnected System load forecast.

To facilitate an increased understanding of the load forecast, this document is intended to provide:

- An overview of Hydro's load forecast philosophy;
- A description of the development of and methodology behind Hydro's load forecast;
- A description of the inputs used to generate the load forecast;
- A summary of Hydro's 2024 Energy Consumption;
- A listing of underlying assumptions for each of Hydro's load forecast scenarios; and
- A discussion of key drivers that influence the outcomes of the load forecast.

2.0 Load Forecast Philosophy

The purpose of load forecasting is to project electric power demand and energy requirements for future periods.[17] The objective of the load forecast process is to characterize and understand the range of possible system demand and energy requirements arising from the inherent uncertainty in the load forecast model inputs, to ensure that Hydro is prepared to serve its customers' needs in the near and long term. As a result, the load forecast is a key input to the resource planning process, which

[16] Hydro also produces a forecast for the Isolated System and Labrador Interconnected System; however, this report focuses on the forecasts for the Island Interconnected System only.
[17] Demand is the rate at which electric energy is delivered to or by a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time.

recommends what resources should be made available to meet projected demand within the province, consistent with applied reliability standards.

As is generally the case in utility system planning, Hydro uses the Reference Case plus alternative scenarios approach to its load forecast development. The Reference Case is developed to represent Hydro's expectation of the demand and energy requirements that would materialize based on the use of baseline expectations for economic growth and existing government policies and programs. Alternatives to the Reference Case are developed to determine the sensitivity of system requirements to changes in key inputs, both in terms of the magnitude of change and timing of requirements.

Consideration of a range of alternatives is a critical component of Hydro's planning activities, as it allows for the impact of uncertainty in input parameters on the overall forecast. This enables Hydro and its stakeholders to understand the impact of key parameters like policy adoption rates and differing economic conditions when assessing options and timing of resource additions to meet future customer requirements.

3.0 Load Forecast Methodology

For the Island Interconnected System, the load forecast is segmented into utility load (i.e., Domestic and General Service loads of Newfoundland Power Inc. ("Newfoundland Power") and Hydro) and Industrial load.

The load forecast process for the Island Interconnected System translates the long-term economic outlook and energy price forecast for the Island into corresponding utility demand and energy requirements for the electric power systems.

The forecast process also involves the development and analysis of potential new loads associated with electrification (e.g., EV adoption and conversions of heating systems to electric heat).

For Hydro's large Industrial customers, direct input from those customers forms the basis for Hydro's forecast of their firm electric power requirements.[18] Hydro does not include non-firm power requests in the development of the annual load forecast.

[18] Firm demand is the portion of the demand that a power supplier is obligated to provide, except when system reliability is threatened or during emergency conditions. Firm energy refers to the actual energy guaranteed to be available to meet customer requirements on an annual basis.

3.1 Development of the Island Interconnected System Forecast

The Island Interconnected System load, exclusive of transmission losses and station service, is the summation of interconnected utility load, Industrial customer loads, and the distribution losses incurred serving the customer load requirements on the system.

The load forecast for the Island Interconnected System results from the combination of forecasts prepared for:

- Load served by Newfoundland Power;
- Industrial customers' load served by Hydro; and
- Rural load served by Hydro.

The forecast for transmission losses and station service load is then modelled using the Island Interconnected System forecast results and assumptions surrounding existing and potential generation resources.

Each of the forecasts for the Island Interconnected System is prepared using a set of inputs that form the basis for determining peak demand and energy requirements over the term of the forecast. Key inputs to the Island Interconnected System forecast include:

- Government economic forecast:
  - Hydro relies on the annual Government long-term economic forecast for economic and other provincial variable assumptions in its load forecast. The economic forecast provides a provincial perspective and appropriately considers local projects and demographics.
- Newfoundland Power load requirements:
  - Newfoundland Power provides service to the majority of customers on the Island portion of the province. In 2024, its requirements represented 87% of the Island Interconnected System demand requirements and 78% of the Island Interconnected System energy requirements.[19] Newfoundland Power's historical billing data and information contained within its five-year load forecast are used by Hydro as inputs into its long-term load forecast.

[19] Exclusive of transmission losses and station service.

- EV adoption:
    - Considers the impact of EV adoption on demand and energy requirements. In early 2024, Hydro engaged an external consultant, Dunsky, to develop various forecast scenarios for EV adoption in the province. A forecast scenario was chosen for the Reference Case that considers the expected trajectory of EV adoption in the region, while sensitivities consider the potential impacts of both a slower and a more accelerated adoption rate to assess impacts on load requirements in the future. All scenarios assume utility management of EV home charging will be a part of demand response programming. In September 2025, the federal government has paused EV targets for 2026 while it completes a review of EVAS; however, Hydro's Reference Case load forecast does not reach the existing federal targets. Hydro plans to engage Dunsky in 2026 for an update to its current EV forecast scenarios.
- Government policies and programs:
    - Considers the impact of provincial and federal policies on demand and energy requirements. The Reference Case forecast considers the impacts of established and committed programs on system requirements (e.g., oil-to-electric home heating conversions, housing investment), while sensitivity forecasts consider the implications of changes in policy or programs as well as changes in the uptake or adoption of such policies or programs.
- Electricity rates:[20,21]
    - The underlying electricity rate used in developing the 2025 Load Forecast aligns with the Government's publicly announced finalized rate mitigation plan.[22] The plan ensures domestic residential rate increases by Hydro are targeted at 2.25% annually and provides clarity on Hydro's annual electricity rate increases associated with the Muskrat Falls Project up to and including 2030. Hydro will work with the Government in advance of 2030 to determine future rate mitigation requirements once more information on the landscape of the electricity sector in that period is known.[23] The electricity rate also incorporates the cost

[20] The rate forecast underlying the Reference Case and load forecast scenarios can be found in Attachment 1.
[21] The rates provided herein are estimates based on assumptions made at a point in time. Actual customer rates could differ from those outlined herein for a variety of reasons, including assumptions around rate mitigation post-2030, actual customer load, rate increases associated with Newfoundland Power's costs, etc.
[22] "Provincial Government Announces Finalization of Rate Mitigation Plan," Government of Newfoundland and Labrador, May 16, 2024, https://www.gov.nl.ca/releases/2024/iet/0516n01/.
[23] For purposes of the load forecast report, Hydro assumes rate mitigation continues for the full forecast period.

of the resources identified in the Minimum Investment Required Expansion Plan from the 2024 Resource Adequacy Plan. This underlying rate forecast assumption was used in all three scenarios for the 2025 Load Forecast.

- Industrial customer load requirements:
  - Hydro works closely with its Industrial customers to forecast the demand and energy requirements associated with each customer's business activities and future potential plans. The potential for new Industrial customers is also considered in forecast development scenarios. The various projections for existing and new customers are then combined to form the basis of Hydro's load forecast of Industrial customer requirements.

3.2 Discussion of Major Inputs to the 2025 Load Forecast

Major inputs discussed here are those variables identified as inputs to the modelling and analysis that have the most potential to impact (or be impacted by) the evolving energy landscape. Some of these major inputs are also those with the most uncertainty, making it prudent to identify a range of potential outcomes.

3.2.1 Island Interconnected System Forecast Assumptions

The major inputs driving growth in the Island Interconnected System, as well as the pace of change of each, are summarized in Table 2 and are described in further detail in the following sections.

Table 2: Major Inputs and Factors Driving Growth

EVs	Economic Growth	Decarbonization and Electrification	Energy Efficiency	Industrial Growth
• Total cost of EV ownership • Availability of charging infrastructure • Available vehicle supply • Government policy • Available incentives	• Population changes/immigration • Commercial development, including major projects • Housing starts	• Government policy, mandates and regulations • Available incentives	• Availability of new technologies • Utility programming	• Electrification of existing and new processes/facilities • Expansion

3.2.1.1 Electric Vehicles[24]

For the 2025 Load Forecast update, Hydro utilized a combination of the different forecasts provided by Dunsky to create three distinct forecasts: the EV Reference Case forecast, a Slower EV Adoption forecast, and an Accelerated EV Adoption forecast that would meet the federal government's proposed regulated target of 100% of new light-duty vehicle ("LDV") sales being a zero-emission vehicle by 2035. A comparison of the forecasts and the federal government targets is provided in Section 4.1.

Hydro plans to engage Dunsky in early 2026 to update its EV Scenario forecasts and will incorporate any potential changes to federal programs to ensure it is accounted for in the 2026 Load Forecast.

For the Island Interconnected System forecast scenarios, the Reference Case utilized the EV Reference forecast, the Slow Electrification scenario utilized the EV forecast with slower adoption, and the Accelerated Electrification scenario utilized the EV forecast with accelerated adoption.[25]

Chart 3 shows the impact of EV charging on the Island Interconnected System demand for the three forecast scenarios. By 2036, there is approximately a 105 MW[26] variance between the Slow Electrification and the Accelerated Electrification scenarios.

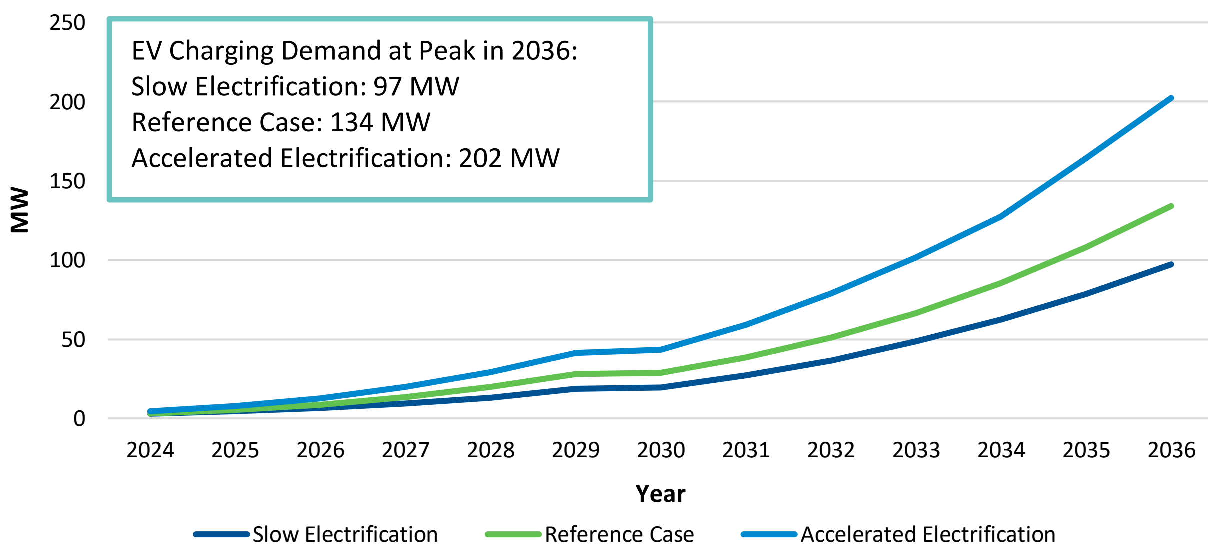

Chart 3: EV Charging Demand at Island Interconnected System Peak

[24] Information on the cumulative EV sales for the Island Interconnected System for the Reference Case and alternate scenario forecasts can be found in Attachment 1.

[25] Hydro used the "High Sensitivity" EV accelerated forecast in its Accelerated Electrification scenario.

[26] Accelerated Electrification of 202 MW in 2036 minus Slow Electrification of 97 MW in 2036 = 105 MW.

Chart 4 shows the impact of EV charging on the Island Interconnected System on energy requirements for the three forecast scenarios. There is a total variance of approximately 573 GWh[27] between the Slow Electrification and the Accelerated Electrification scenarios by the end of the forecast period.

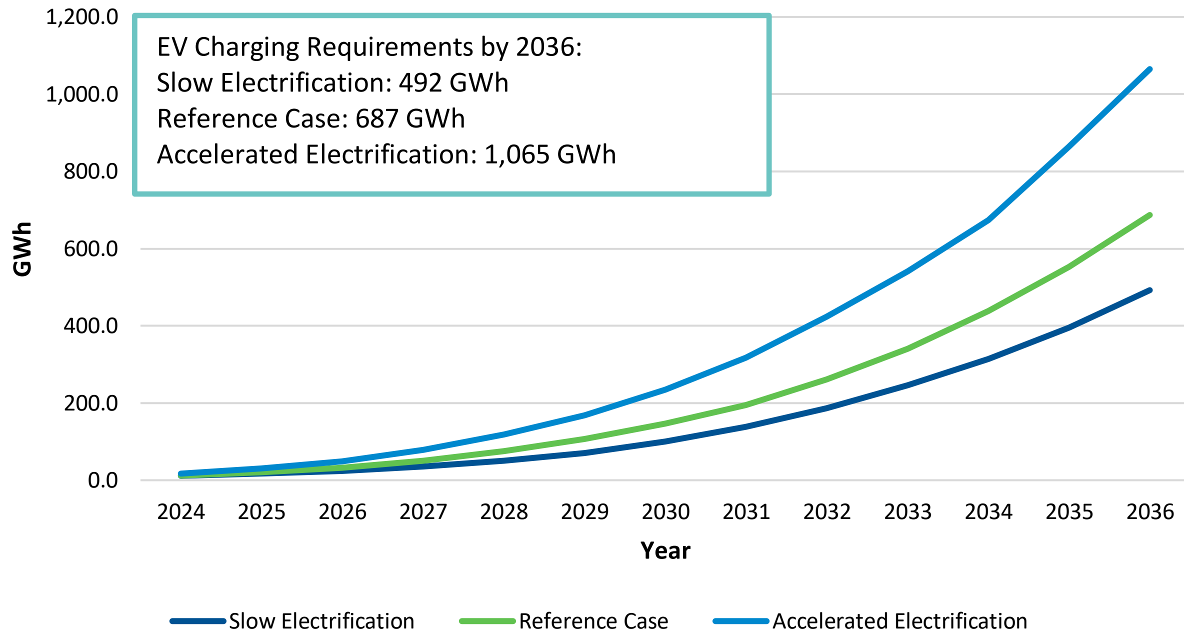

Chart 4: Island Interconnected System EV Charging Energy Requirements

It is assumed that by 2030, the system peak will include utility management of EV home charging to reduce the impact on the system peak in all scenarios. This is assumed to be achieved through EV smart chargers. Medium- and heavy-duty vehicles and buses are assumed to be managed by customers to reduce demand charges and avoid equipment upgrades. In all three forecast scenarios, it is assumed that approximately 50% of home charging of LDVs will be managed during peak.[28] Managed home charging can significantly reduce evening EV load by shifting the load to the overnight period. If home charging during peak demand is not managed, it is estimated to result in an additional demand of 43 MW by 2036.

[27] Accelerated Electrification of 1,065 GWh in 2036 minus Slow Electrification of 492 GWh in 2036 = 573 GWh.
[28] As shown in Attachment 2, Slide 19.

Newfoundland Power recently completed an EV load management pilot project to gather information on demand management on the Island.[29] The pilot was conducted for two winters, and Hydro is working closely with Newfoundland Power to understand the demand response potential for light-duty EVs. Results from the pilot project may be used to inform the development of a future demand management program.

Based on Dunsky's analysis, the potential electrical system impact from EVs could be substantial by the end of the period; however, there remains a fair degree of variance in the range of forecast requirements identified between the three EV scenarios considered.[30]

3.2.1.2 Economic Information

Hydro relies on the Government's annual long-term economic forecasts for economic and other provincial variables for input assumptions in the load forecast. These forecasts provide a provincial perspective and appropriately consider local projects and demographics.

Economic growth is a major input into the development of the load forecast because it captures several factors that influence energy use in both the residential and general service sectors. Increased income can result in additional demand for goods and services, and increased production to meet the demand generally requires more energy.

For 2025, residential regressions underlying the forecasting model rely on a prediction of customer numbers and customer average use. Hydro uses new housing starts in generating the residential customer number forecasts, while household disposable income and provincial population are used to determine average customer use. The general service model for Newfoundland Power that Hydro creates continues to use adjusted gross domestic product ("GDP") and non-residential building investment as primary inputs. Forecast future sales for Hydro's rural general service sales are generated using forecasts of household disposable income and the value of fish landings.

In the underlying economic forecast for the Reference Case, the projects proposed in the 2025 Build Application[31] are included as well as increased mining activity that will positively influence provincial

[29] "EV Load Management Pilot Project," Newfoundland Power Inc., June 2, 2023, http://www.pub.nl.ca/applications/2023/NP2023ElectricVehicleLoad/app/From%20NP%20-%20%20Application%20for%20Electric%20Vehicle%20Load%20Management%20Pilot%20Project%20-%202023-06-02.PDF.
[30] For more information on the EV adoption and impacts provided by Dunsky, please refer to Attachment 2.
[31] These include Bay d'Espoir Unit 8 and the Avalon Combustion Turbine.

economic activity, leading to increased investment and employment gains. The provincial population is also forecast to stabilize in the near term before declining based on a natural decline rate. Table 3 compares the population forecast for the three load forecast scenarios until 2036.

Table 3: Population Forecasts (000s)

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	CAGR (%)
Slow Electrification	548	548	550	552	552	550	547	544	540	536	531	-0.3
Reference Case	548	548	550	552	552	550	547	544	540	536	531	-0.3
Accelerated Electrification	548	549	551	556	564	572	576	580	582	581	575	0.5

For the development of the Slow Electrification scenario, Hydro used the Reference Case economic variables except for housing starts, which are lower than the Reference Case beginning in 2030. Domestic Rates are slightly higher in the Slow Electrification Scenario compared to the Reference Case.

For the Accelerated Electrification scenario, Hydro used an alternate scenario provided by the Government that included more major projects, which led to stronger economic growth and higher population and housing starts. Other adjustments from the Reference Case include increased oil-to-electric conversions for Government-owned buildings and additional industrial projects. These assumptions result in higher electricity demands compared to the Reference Case.

Table 4 shows the key economic inputs used in the forecast model for the three forecast scenarios.

Table 4: Island Interconnected System Economic Indicators (2026–2036)

Economic Driver	Slow Electrification	Reference Case	Accelerated Electrification
Adjusted Real GDP at Basic Prices (% per year)	-0.7	-0.7	-0.1
Real Household Disposable Income (% per year)	0.1	0.1	0.7
End of Forecast Period Population (000s)	530.8	530.8	575.3
Average Housing Starts Per Year	1,613	2,036	2,263
Cumulative Non-Residential Building Investment Over the Forecast Period ($000)	5,537	5,537	5,684

1 Chart 5 and Chart 6 provide visual representations of two of the economic parameters supporting
2 growth on the Island Interconnected System in the 2025 Load Forecast: provincial population growth
3 and housing starts. Housing starts are expected to be strong, given federal contributions to help
4 alleviate the housing shortage in the province.[32]

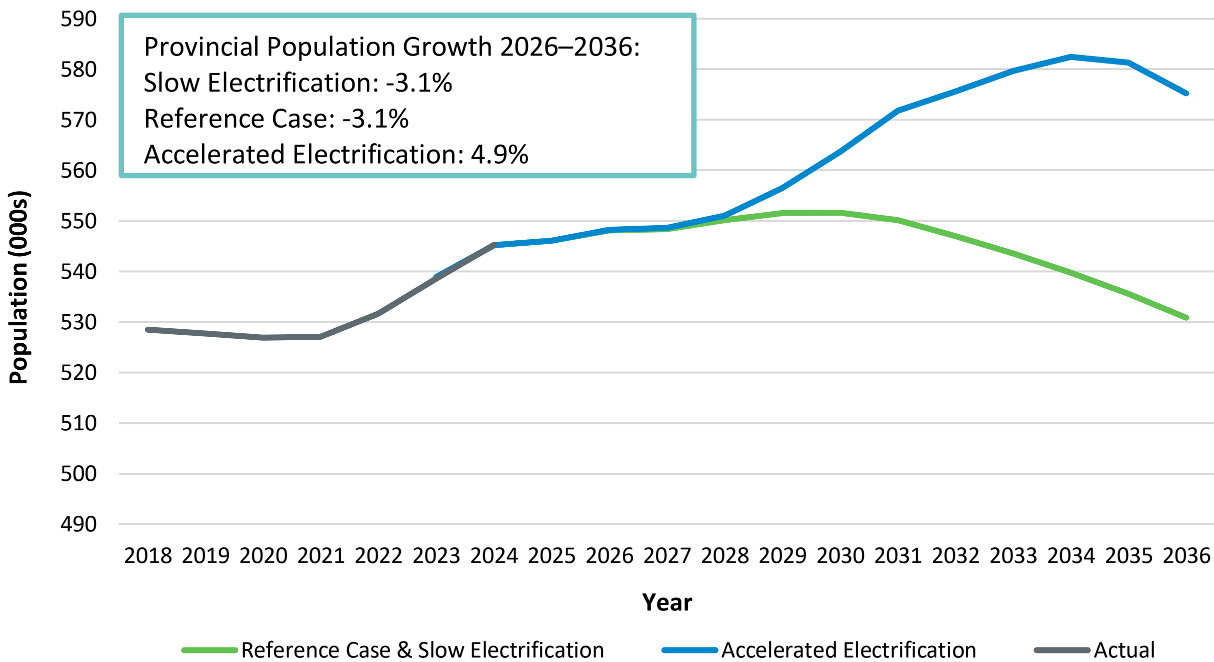

Chart 5: Actual and Forecast Provincial Population

[32] "Government investing in new homes in Newfoundland and Labrador," CMHC, February 24, 2025, https://www.cmhc-schl.gc.ca/media-newsroom/news-releases/2025/governments-investing-new-homes-newfoundland-labrador.

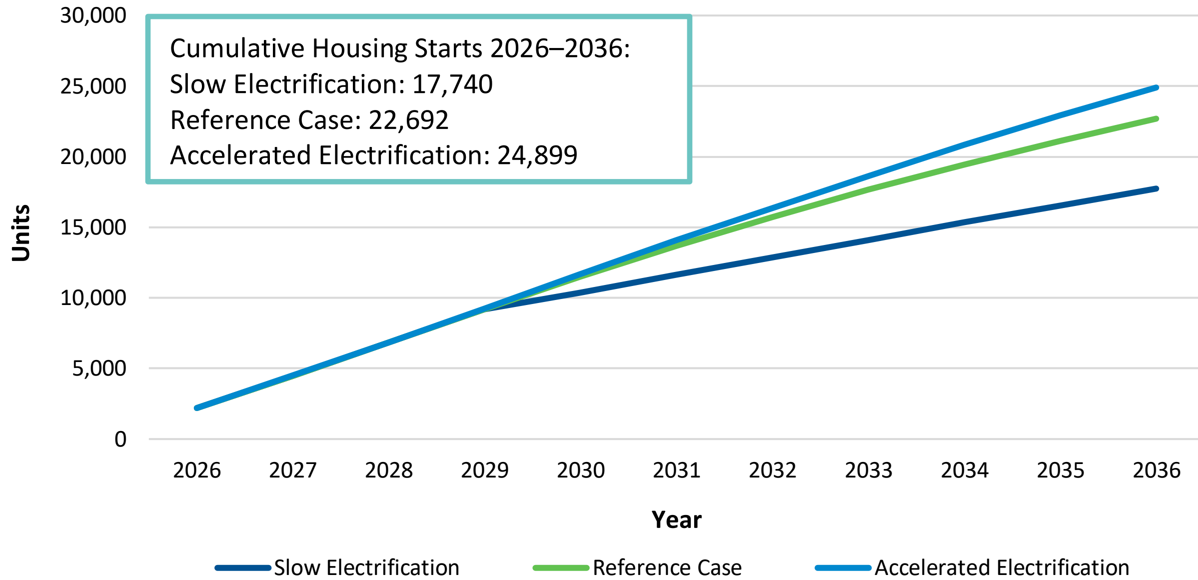

Chart 6: Cumulative Housing Starts

3.2.1.3 Decarbonization and Electrification (Utility Sales)

Government policy continues to have the greatest potential to drive decarbonization and electrification across several sectors, such as space heating and transportation, as well as influence the overall decarbonization of the province. Electrification has the potential to change the quantity and usage pattern of electricity by customers in Newfoundland and Labrador. Since 2022, Newfoundland and Labrador has seen over 4,000 oil-to-electric conversions, which are tracked by the provincial rebate program.[33] This is approximately 10% of registered oil tanks during this period. Additionally, Memorial University of Newfoundland and Labrador ("MUN") is expected to complete the installation of electric boilers for its campus building in the fall of 2025.

All levels of government are focusing on decarbonization and electrification; however, there remains uncertainty in the timing and extent to which policies may be implemented. For the 2025 Load Forecast modelling process, decarbonization factors that were considered in the development of forecast scenarios include government policy (including mandates and regulations) and available incentives.[34]

[33] takeCHARGE. (n.d.). *Oil to electric incentive program*. https://takechargenl.ca/oiltoelectric/.
[34] In June 2023, the Government, in collaboration with Natural Resources Canada and Environment and Climate Change Canada, announced funding towards the implementation of new fuel switching and energy efficiency incentive programs. https://www.gov.nl.ca/releases/2023/ecc/0629n03/.

The Reference Case is representative of steady electrification in the space-heating sector. For the residential space-heating sector, it is assumed that 60% of homes that are currently oil-heated but have an oil tank that will expire during the forecast period will convert to electric heat.[35] The provincial government program for oil-to-electric conversions is delivered through the takeCHARGE program and requires participants to remove their oil tank to meet program eligibility requirements. Oil to Electric Program applications are due by the end of March 2026, and after this point, Hydro assumes a percentage of customers with expiring oil tanks will choose to switch to electric heating as opposed to installing a new oil tank. Over the forecast period, the percentages of conversions will naturally decline with some variations year over year, depending on forecasted expiration dates.

In the commercial sector, it is assumed that there will be a modest amount of Government buildings converting existing alternate fuel heating systems to electric heat, consistent with the Government's planned building conversions.[36] In forecasting the commercial sector, it is assumed that all new customers will use electric heat.

The Slow Electrification scenario is representative of modest electrification. It is assumed that 54% of oil-heated homes with an oil tank expiring during the forecast period will convert to electric heat. In the commercial sector, the same assumptions were used as in the Reference Case.

The Accelerated Electrification scenario is representative of accelerated electrification. It is assumed that 95% of oil-heated homes with an oil tank expiring during the forecast period will convert to electric heat. It is also assumed that a portion of oil-heating customers with oil tanks expiring outside of the forecast period will convert to electric heat within the next ten years. In the commercial sector, it is assumed that an additional 50% of the Government's Transportation and Infrastructure buildings and health facilities will convert their heating systems to electric heat, in addition to the Government's planned building conversions. Consistent with the Reference Case, it is assumed that all new commercial customers will use electric heat.

[35] Approximately 18,100 homes in Newfoundland and Labrador have oil tanks expiring during the forecast period.
[36] Consistent with Government's list of government building conversions dated April 2024; no further updates provided for 2025.

Table 5 summarizes the space-heating assumptions for the Island Interconnected System included in the Reference Case and both considered alternative scenarios.

Table 5: Electrification of Space Heating (2026–2036)

	Slow Electrification	**Reference Case**	**Accelerated Electrification**
Residential Conversions to Electric Heat During the Forecast Period (Approximate)[37]	7,800	8,870	17,730
New General Service Customers' Primary Heating Source	Electric	Electric	Electric
Government Building Conversions in 2036 (GWh)	21	21	46

Chart 7 provides a visual representation of the oil-to-electric conversions assumed through the forecast period (2026–2036).

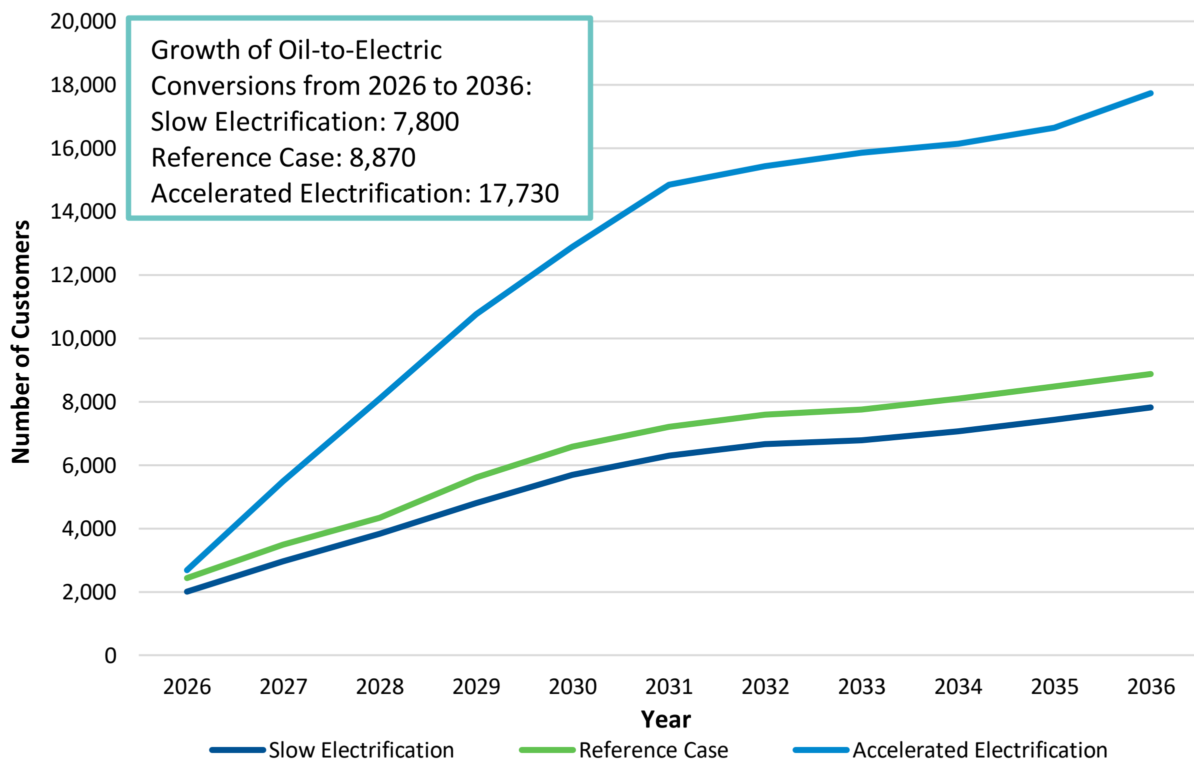

Chart 7: Cumulative Number of Residential Oil-to-Electric Conversions

[37] There are approximately 36,300 registered oil tanks on the Island.

3.2.1.4 Conservation and Energy Efficiency

Hydro and Newfoundland Power offer a variety of information and financial support options to customers to help them manage their energy usage. Since 2009, both utilities have offered customer energy conservation programs on a joint and coordinated basis under the takeCHARGE brand.

Examples of the residential programs offered include insulation, air sealing, and heat recovery ventilators. takeCHARGE also serves the commercial sector through the Business Efficiency Program and, in more recent years, a pilot program targeting small business customers was introduced.

For the 2025 Load Forecast update, an estimate of energy savings through utility conservation programs, as forecasted by takeCHARGE, was developed. This estimate was used for all three load forecast scenarios.

Over the last decade, the installation of mini-split heat pumps (“MSHP”) in residential homes has grown in popularity, with Newfoundland Power’s 2024 customer survey estimating that approximately 43% of their domestic customers have an MSHP installed. In homes with electricity as the primary heating source, MSHPs are primarily being installed to reduce overall energy consumption.[38] For the 2025 Load Forecast update, forecasts were developed for the number of primarily electrically heated residential homes installing an MSHP. While non-electrically heated homes also install MSHPs, for forecast purposes, it was assumed that all non-electrically heated homes installing a MSHP are reflected in projections associated with the Oil-to-Electric Conversion Program.

In the Reference Case and the Accelerated Electrification scenario, it is assumed that by the end of 2036, approximately 72% of Newfoundland Power’s residential customers who use electricity as their primary heating source will have installed MSHPs in their homes.[39]

In the Slow Electrification scenario, it is assumed that by the end of 2036, 76% of Newfoundland Power’s residential customers with electric heat will have installed MSHPs in their homes, slightly more than the

[38] “2021 Conservation and Demand Management Report,” Newfoundland Power Inc., April 1, 2022, app. B. http://www.pub.nf.ca/indexreports/conservation/From%20NP%20-%202021%20Conservation%20and%20Demand%20Management%20Report%20-%202022-04-01.PDF.
[39] Based on Newfoundland Power’s 2024 residential customer count.

Reference Case and the Accelerated Electrification scenario due to higher energy efficiency measures stemming from higher electricity rates.[40]

The Posterity Group conducted a joint Potential Study with Newfoundland Power and Hydro on electrification, conservation and demand management measures. Completed through takeCHARGE, the Potential Study analyzed the potential for energy efficiency, demand management and electrification on the Island Interconnected System. Hydro used Newfoundland Power's Spring 2025 load forecast inputs for conservation and demand management, which included information from the Potential Study.

3.2.1.5 Industrial Customer Growth

Industrial load on the Island Interconnected System is currently comprised of six customers. In recent years, Newfoundland and Labrador has seen record-setting exploration expenditures in the mining sector. The Valentine Mine has connected to the grid and continues to ramp up its operations. The forecasts also reflect a reduction in industrial customers due to their current market environment.

In the Reference Case, it is assumed all current industrial customers will remain, and business activities will continue at currently forecasted levels, with the exception of one Industrial customer that is not expected to continue operations past December 2025.

The Slow Electrification scenario assumes one industrial load uses 5 MW less firm load by availing of the allowed interruptible load in their contract. All other loads remain the same as the Reference case.

In the Accelerated Electrification scenario, the assumption for current Industrial customers is the same as the Reference scenario. The Accelerated Electrification scenario also assumes the addition of a new Industrial customer load of 20 MW in 2028, followed by 40 MW of additional load in both 2029 and 2031, for a total load increase of 100 MW by 2031. Hydro will continue to closely monitor new large load requests and major projects and will adjust future scenario assumptions as required. Chart 8 provides a visual representation of the Island Interconnected System industrial demand under the three load forecast scenarios.

[40] Based on Newfoundland Power's 2024 residential customer count.

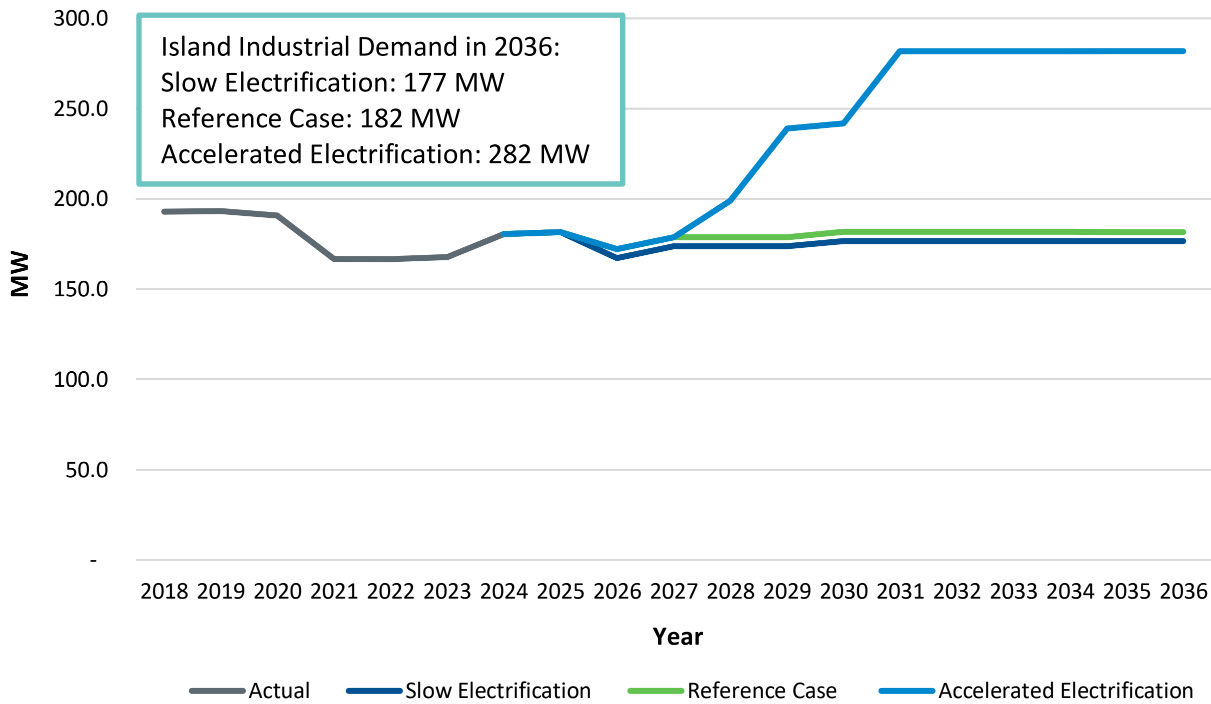

Chart 8: Island Interconnected Industrial Demand[41]

3.2.1.6 Weather Data

Weather, specifically ambient temperature, is one of the largest factors affecting customer electricity usage and demand in Newfoundland and Labrador. Hydro uses weather variables in its energy and peak models, including heating degree days[42] and wind chill. For weather variables, Hydro focuses on estimating a "normal" weather year, rather than predicting what may occur in any specific year. For the Island Interconnected System energy models, Hydro uses a rolling 30-year average for the initial starting value of heating degree days and has implemented the use of a linear trend model to reflect gradual warming, resulting from climate change and reflecting recent winter weather history, over the forecast period. For the peak model, Hydro continues to use a rolling 30-year average wind chill value or P50 weather conditions as an input for peaking event conditions.[43]

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[41] Total industrial demand is the summation of firm requirements for Industrial customers. Values are not reflective of industrial demand at the time of the Island Interconnected System peak.
[42] Heating degree days refer to the equal number of degrees Celsius that a given day's mean temperature is below 18°C.
[43] A P50 forecast is one in which the actual peak demand is expected to be below the forecast number 50% of the time and above 50% of the time (i.e., the average forecast).

At this time, Hydro is not including additional forecast combinations for more extreme peak conditions in the development of its forecasts; however, Hydro continues to assess the impact that P90 conditions may have on the demand forecast and on its ability to supply customers should such conditions occur. The P90 weather condition is based on 30 years of historical wind chill values during the winter period, and these assumptions increase the Island Interconnected System requirements by approximately 60 MW.[44]

4.0 Hydro's 2025 Load Forecast[45]

The 2025 reference forecast, as shown in Chart 9 resulted in accelerated growth in the medium- to long-term portion of the forecast period of 2026 to 2036, as compared to that of the previous ten years. The forecast growth is driven by sustained customer growth, electrification of the transportation and space-heating sectors, and increased industrial requirements. Also of note is the installation of MUN's electric boilers, which are forecasted to be in service at its campus building in the fall of 2025.

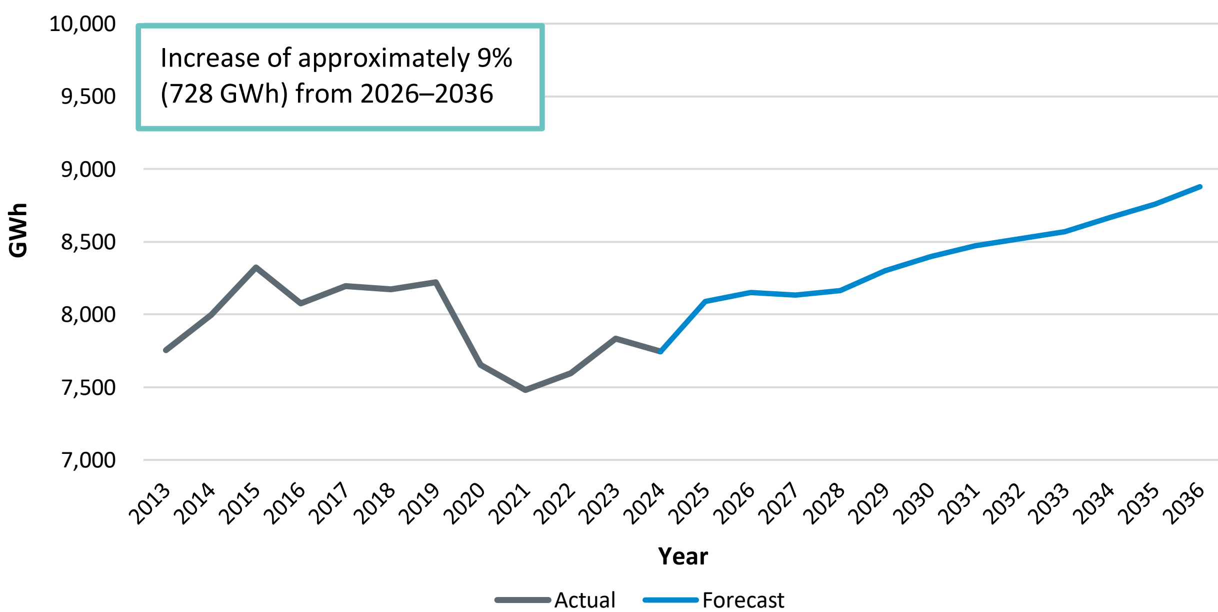

Chart 9: Island Interconnected System Net Energy Generation: Reference Case[46,47]

[44] A P90 forecast is one in which the actual peak demand is expected to be below the forecast number 90% of the time and above 10% of the time (i.e., there is a 10% chance of the actual peak demand exceeding the forecast peak demand).
[45] Tables detailing the 2025 Reference Case, Slow Electrification scenario, and Accelerated Electrification scenario load forecasts can be found in Attachment 1.
[46] Newfoundland and Labrador Interconnected System net generation is total generation requirements less transmission losses and stations' service.
[47] Historical values are not weather-normalized.

The following sections present the details arising from the 2025 Load Forecast for the Island Interconnected System.

4.1 Island Interconnected System Load Forecast

Hydro focused on the development of three scenarios for the Island Interconnected System. Scenarios were developed to help assess the impact of varying provincial economic growth forecasts and both the extent and timing of electrification initiatives in the heating and transportation sectors. The scenarios developed for the Island Interconnected System as part of the 2025 Load Forecast are summarized in Figure 2.

Slow Electrification

- Results in lower load growth relative to the Reference Case; reflects slower decarbonization combined with a steady, slower electrification of the transportation sector, and lower housing starts.

Reference Case

- The expected load growth case; reflective of expected population growth and current/committed Government decarbonization policies and programs.

Accelerated Electrification

- Results in higher load growth relative to the Reference Case; reflects accelerated policy-driven decarbonization, combined with accelerated transportation electrification, higher housing starts and an increase in industrial load requirements.

Figure 2: Island Interconnected System 2025 Load Forecast Scenarios

The Reference Case is reflective of a future that can be primarily defined by steady electrification, economic growth and favourable economics driven primarily by a strong housing market and a stable population. In the residential space heating sector, it is assumed there will be steady conversions from oil heating systems to electric heating systems. This is driven primarily by the implementation of new fuel switching and energy efficiency incentive programs as part of a collaboration between the Government, Natural Resources Canada, and Environment and Climate Change Canada. In the transportation sector, Dunsky continues to estimate that EV adoption in Newfoundland and Labrador will not meet the federal government target that 100% of sales of LDVs must be zero emission by 2035.

However, there is still a strong uptake of EVs forecast to occur, with approximately 116,000 zero-emission LDVs on the road in the province in 2036.[48] In September 2025, the federal government has paused EV targets for 2026 while it completes a review of EVAS; however, as demonstrated in Table 6, all but Hydro's Accelerated Electrification load forecast scenarios include EV adoption rates that were materially lower than federal EVAS targets. As noted in Section 3.2.1.1, Hydro will engage with Dunsky in early 2026 to update its EV forecast to incorporate any new federal targets and programming.

Table 6 shows the three forecast scenarios compared to the current Federal Mandate for the percentage of new LDV sales for 2026, 2030, and 2035 that are forecast to be EVs. In the Reference Case scenario, EVs are forecast to account for half of all new LDV sales by 2035.

Table 6: Percentage of New LDV Vehicle Sales That Are EVs (%)

Rounded Table	Federal Mandate[49]	Slow Electrification	Reference Case	Accelerated Electrification
2026	20	5	10	10
2030	60	15	20	30
2035	100	45	55	100

The first alternative scenario, Slow Electrification, contemplates a future with slower decarbonization efforts, as compared to the Reference Case. In the residential space-heating sector, it is assumed there will be a modest conversion from oil to electric heating as compared to the Reference Case. A steady uptake of EVs is forecast, with approximately 85,000 zero-emissions LDVs on the road in the province in 2036. This scenario also assumes the same population forecast with lower housing starts.

The second alternative scenario, Accelerated Electrification, contemplates a future with accelerated decarbonization efforts, as compared to the Reference Case. In the residential space heating sector, it is assumed there will be accelerated conversions from oil to electric heating. In the transportation sector, an accelerated uptake of zero-emissions LDVs is assumed, including achieving the Government of Canada's intention to set a mandatory target for sales of all new light-duty cars and passenger trucks to

[48] There were approximately 414,000 vehicles on the road in Newfoundland and Labrador in 2022, as shown in Attachment 2, Slide 11.
[49] Environment and Climate Change Canada. (2023, December 19). *Canada's Electric Vehicle Availability Standard (regulated targets for zero-emission vehicles)*. Government of Canada. https://www.canada.ca/en/environment-climate-change/news/2023/12/canadas-electric-vehicle-availability-standard-regulated-targets-for-zero-emission-vehicles.html.

be zero-emission by 2035,[50] with approximately 186,000 zero-emission LDVs on the road in Newfoundland in 2036.[51] This scenario also includes additional major projects leading to higher load, stemming from new industrial demand in the province, including increased mining activity.

Table 7 summarizes the major drivers for each of the alternative future forecasts that were described in detail in Section 3.2.

Table 7: Major Input Comparison of the Alternative Future Forecasts

Scenario	Slow Electrification	Reference Case	Accelerated Electrification
Scenario Description	Slower decarbonization and transportation electrification	Steady decarbonization and transportation electrification driven by Government policy and programs	Accelerated decarbonization and transportation electrification
Residential Rates	Low Scenario	Reference	Reference
Electric Vehicles	Slower adoption	Reference	Accelerated adoption
Economic Growth	Reference	Reference	Higher economic outlook
Decarbonization Policy (Government Programming)	Slower change	Reference	Accelerated change
Energy Efficiency	Accelerated change	Reference	Reference
Industrial Growth	Lower growth	Reference	Higher growth

Chart 10 and Chart 11 provide a visual representation of the 2025 Load Forecast scenarios for demand and energy developed for the Island Interconnected System compared against historical system demand.

50 In September 2025, the federal government has paused EV targets for 2026 while it completes a review of EVAS; as noted in Section 3.2.1.1, Hydro will engage with Dunsky in early 2026 to update its EV forecast to incorporate any new federal targets and programming.

51 The EV assumption is the high growth case with high sensitivity.

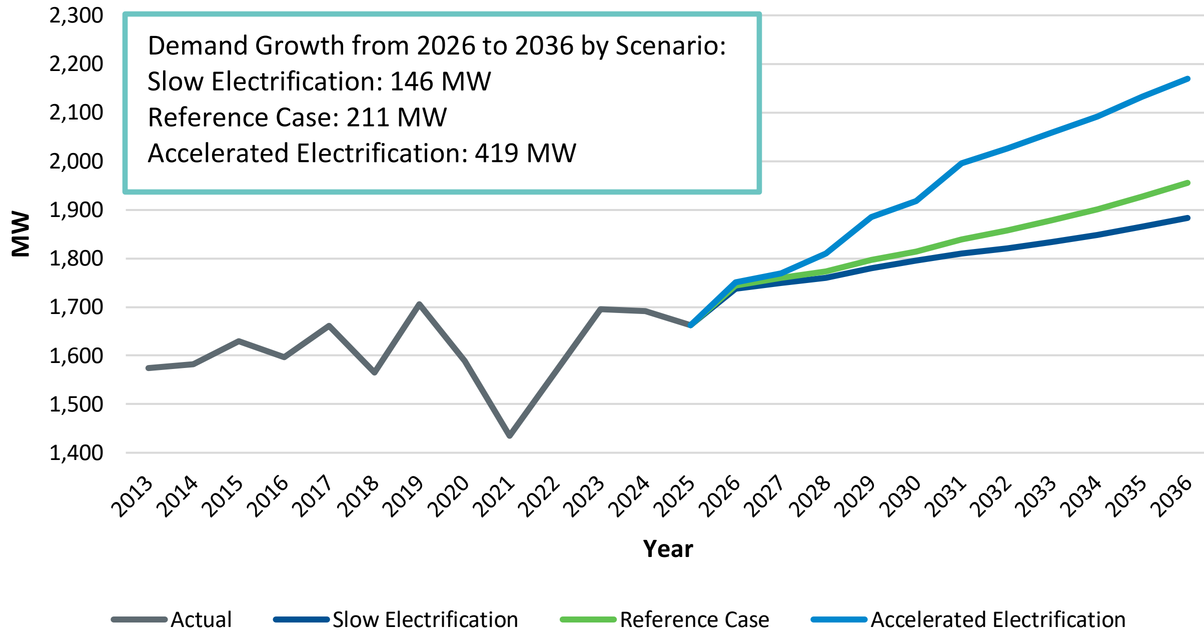

Chart 10: Island Interconnected System Customer Coincident Demand Requirements[52,53,54,55]

[52] Island Interconnected System demand requirements are exclusive of station service and transmission losses.
[53] Historical values are not weather normalized. Forecast values are based on normalized weather conditions.
[54] The significant decline in demand in 2020 and 2021 was due to the effects of the COVID-19 pandemic.
[55] 2025 Peak is year-to-date.

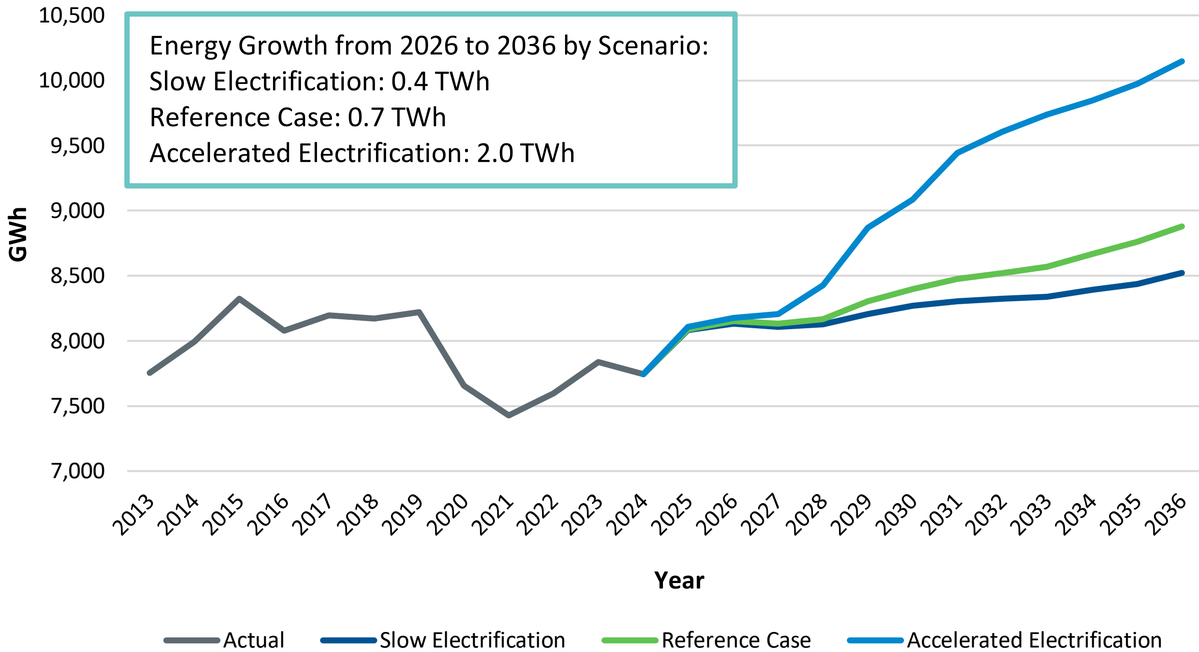

Chart 11: Island Interconnected System Energy Requirements[56,57,58]

Of note is the potential range of load possibilities between the three scenarios. As shown in Table 8, there is a total variance in 2036 of approximately 287 MW[59] of peak demand between the Slow Electrification and the Accelerated Electrification scenarios, with approximately 105 MW[60] of that variance resulting from the difference in EV forecasts at peak. There is a margin of 1,620 GWh[61] in energy requirements in 2036 between the lower and upper bounds provided by the Slow Electrification and the Accelerated Electrification scenarios, with 570 GWh[62] representing the variance between the EV forecasts. The disparity between forecasts at the end of the forecast period reflects both the inherent uncertainty in the later period of the forecast (an intrinsic component of load forecasting) and the uncertainty around the potential timing and extent of electrification between 2026 and 2036. Table 8 summarizes the demand and energy requirements for customers and EVs between the Reference Case and the two alternative scenarios.

[56] Island Interconnected System energy requirements are exclusive of station service and transmission losses.
[57] Historical values are not weather-normalized.
[58] The significant decline in energy requirements in 2020 and 2021 was due to the effects of the COVID-19 pandemic.
[59] Accelerated Electrification Demand of 2,170 MW minus Slow Electrification Demand of 1,883 MW = 287 MW.
[60] Accelerated Electrification EV Demand of 202 MW minus Slow Electrification Demand of 97 MW = 105 MW.
[61] Accelerated Electrification Energy of 10,150 GWh minus Slow Electrification Energy of 8,530 GWh = 1,620 GWh.
[62] Accelerated Electrification EV Energy of 1,070 GWh minus EV Slow Electrification Energy of 500 GWh = 570 GWh.

Table 8: Island Interconnected System Requirements in 2036[63]

	Customer Coincident Demand (MW)	Customer Energy Requirements (GWh)	EV Demand Component (MW)	EV Energy Consumption (GWh)
Slow Electrification	1,883	8,530	97	500
Reference Case	1,955	8,880	134	690
Accelerated Electrification	2,170	10,150	202	1,070

The Slow Electrification scenario represents an approximate 4.0% decrease in total energy consumption compared to the Reference Case and a 3.7% decrease in customer demand. The Accelerated Electrification scenario represents an approximate 11.0% increase in demand and a 14.3% increase in energy consumption compared to the Reference Case.

Table 9 provides a year-over-year comparison of the forecast energy for each scenario as well as a CAGR for each case.

Table 9: Energy by Scenario

Year	Slow Electrification	Y/Y Change (%)	Reference Case	Y/Y Change (%)	Accelerated Electrification	Y/Y Change (%)
2026	8,134	-	8,150	-	8,178	-
2027	8,106	-0.3	8,133	-0.2	8,206	0.3
2028	8,128	0.3	8,165	0.4	8,427	2.7
2029	8,203	0.9	8,302	1.7	8,869	5.2
2030	8,268	0.8	8,398	1.2	9,086	2.4
2031	8,306	0.5	8,474	0.9	9,445	3.9
2032	8,322	0.2	8,522	0.6	9,603	1.7
2033	8,337	0.2	8,571	0.6	9,736	1.4
2034	8,394	0.7	8,669	1.1	9,848	1.2
2035	8,438	0.5	8,759	1.0	9,971	1.2
2036	8,522	1.0	8,879	1.4	10,147	1.8
CAGR (%)	**0.5**	**-**	**0.9**	**-**	**2.2**	**-**

[63] Excludes transmission losses and station service.

Figure 3 provides a breakout of the Island Interconnected System requirements, which are subsequently discussed in detail in Sections 4.1.1 through 4.1.3.

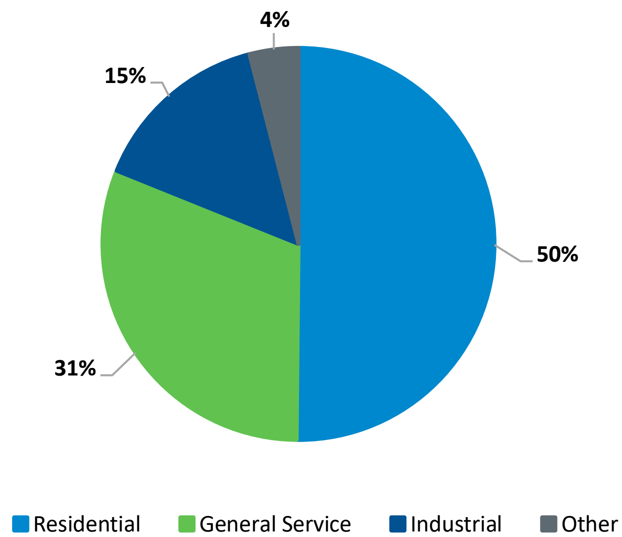

Figure 3: Breakout of Island Interconnected System Requirements[64]

4.1.1 Residential Sales

In 2024, Residential sales made up 50% of the total Island Interconnected System bulk energy deliveries (47% directly by Newfoundland Power and 3% by Hydro).[65] Growth in the residential sector is driven by new customer additions, which are driven by housing starts and oil-to-electric conversions.

Residential space heating in Newfoundland is largely electrified, with over 74% of customers already using electricity as their primary heating source.[66] Over the last ten years, while there has been an increase in the number of customers, average customer use has been decreasing, driven by the installation of MSHP in homes already heating with electric heat. More recently, provincial and federal government funding programs have targeted homes that do not have electricity as the primary heating source to supplement or replace their existing heating source with electric heat. As space heating continues to electrify, growth in electricity use on the Island, driven by switching from oil or wood to electric heat, will be partially offset by greater penetration of energy-efficient heat pumps in electrically

[64] Exclusive of transmission losses and station service.
[65] Bulk energy deliveries do not include transmission losses or station service.
[66] Based on Newfoundland Power and Hydro 2024 billing data.

heated homes. A large number of conversions to electric space heating will result in increased peak demand in the winter period, and the strong uptake of MSHP may result in increased demand in the summer period to meet cooling needs.

Figure 4, Figure 5, and Figure 6 show the composition of electric heat customers for 2015, 2024, and 2036, at the end of the forecast period.

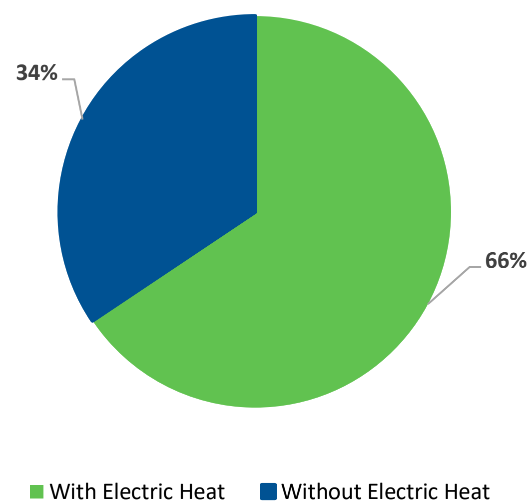

Figure 4: Electric Heat Customers – 2015

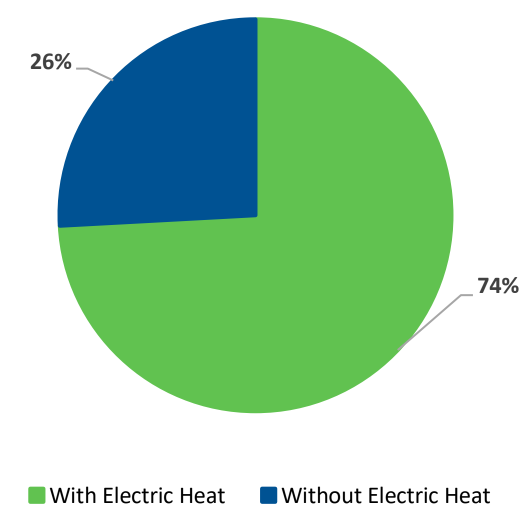

Figure 5: Electric Heat Customers – 2024

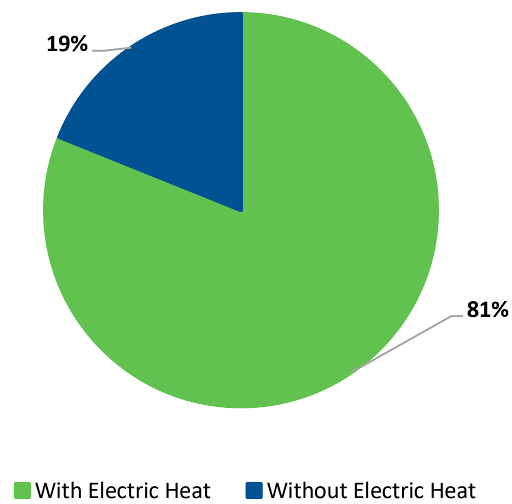

Figure 6: Electric Heat Customers – 2036

Chart 12 depicts the forecast of Residential sales under the three Island Interconnected System scenarios, both including and excluding EV sales, to help visualize the impact EVs are forecasted to have on sales. The variance shown between the Slow Electrification and the Accelerated Electrification scenarios is approximately 801 GWh[67] in 2036, with 427 GWh[68] representing the difference in EV forecasts. The remaining variance primarily reflects the difference in economic growth and penetration levels of electric heat in the forecasts.

[67] Accelerated Electrification Energy of 4,790 GWh minus Slow Electrification Energy of 3,989 GWh = 801 GWh.
[68] Accelerated Electrification Excluding EV Sales Energy of 4,105 GWh minus Slow Electrification Excluding EV Sales Energy of 3,678 GWh = 427 GWh.

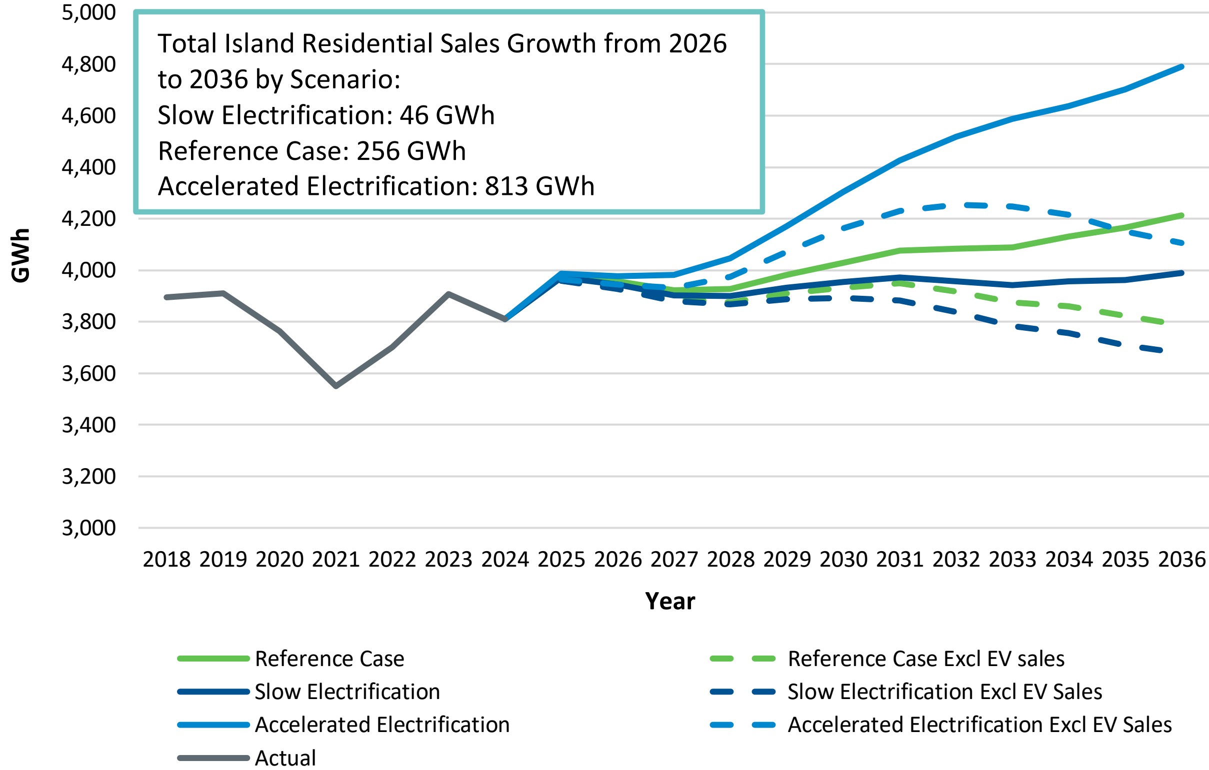

Chart 12: Island Interconnected Residential Sales[69,70]

In the Slow Electrification scenario, residential sales are expected to increase from 2026–2036 by approximately 1%, including EVs; however, the change in residential sales would decline without EV sales over the load forecast period. In the Reference Case, residential sales are expected to grow by approximately 6% including EVs, and decline excluding EV sales. In the Accelerated Electrification scenario, residential sales are expected to increase by approximately 20% with EVs; the change is 4% without EVs.

4.1.2 General Service Sales

The General Service classification includes commercial (e.g., retail, hospitality, offices, etc.) and institutional customers (e.g., hospitals, schools, universities, etc.). In 2024, General Service sales accounted for 31% of total Island Interconnected System bulk energy deliveries (29% Newfoundland Power, 2% Hydro).[71]

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[69] Historical values are not weather-normalized.
[70] The significant decline in energy requirements in 2020 and 2021 was due to the effects of the COVID-19 pandemic.
[71] Bulk energy deliveries do not include transmission losses and station service.

Over the last decade, General Service sales have remained relatively stable; however, General Service sales are expected to grow by approximately 14% from 2026 to 2036 in the Reference Case. The growth in the General Service sector is primarily driven by the electrification of space heating in buildings and the electrification of the transportation sector.

Chart 13 depicts the forecast of General Service sales under the three Island Interconnected System scenarios. The underlying economic forecasts affecting General Service sales are the same in both the Reference Case and the Slow Electrification scenario, and a more optimistic outlook in the Accelerated Electrification scenario. The higher load growth in the Accelerated Electrification scenario is due to increased EVs and electrification.

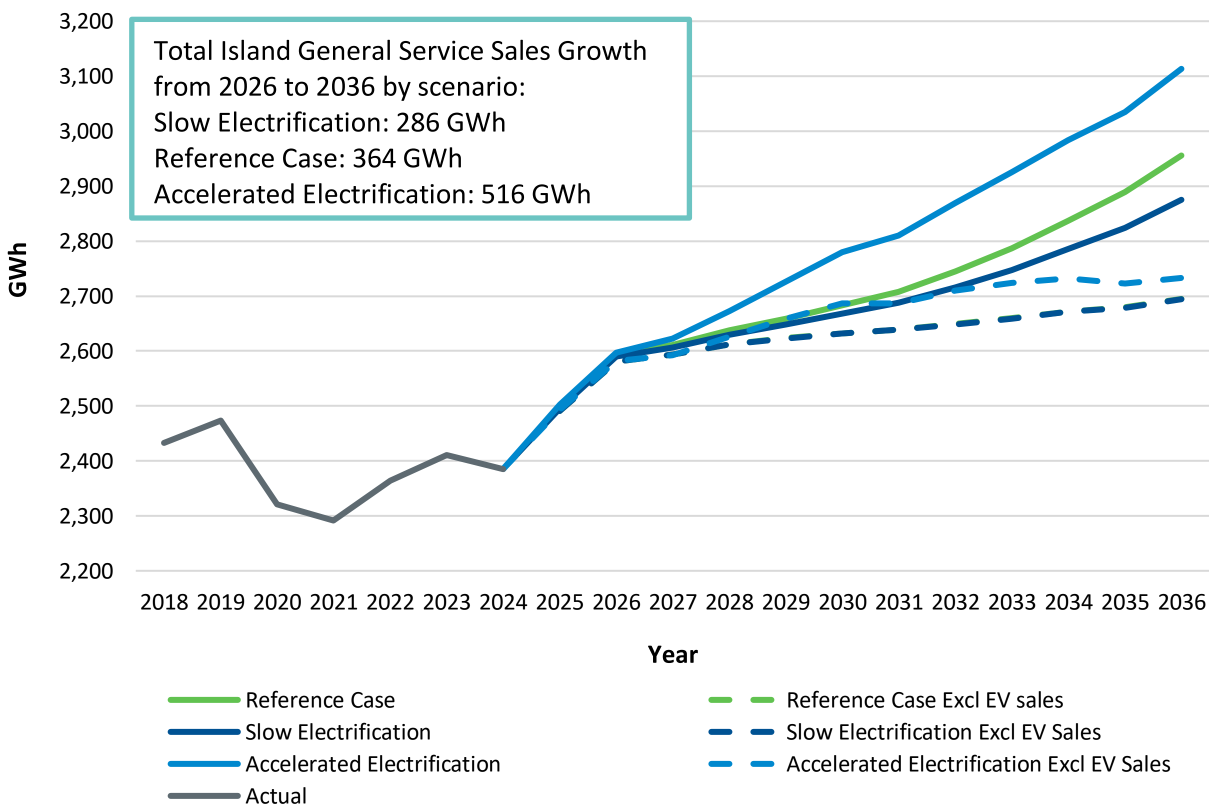


Chart 13: Island Interconnected General Service Sales[72,73,74]

[72] Historical values are not weather normalized.
[73] The significant decline in energy requirements in 2020 and 2021 was due to the effects of the COVID-19 pandemic.
[74] Reference Case Excl EV sales is shown in parallel with the Slow Electrification Excl EV Sales line.

The variance between the Slow Electrification and the Accelerated Electrification scenarios, including EV sales, is approximately 238 GWh[75] by 2036. A sharp increase in General Service sales is observed between 2024 and 2026 as a result of the electrification of oil boilers at MUN.

4.1.3 Industrial Sales

In 2024, sales to Industrial customers accounted for 15% of Island Interconnected System bulk energy deliveries.

The Valentine Gold mining project was connected to the Island Interconnected System in 2024 and began to draw power from the grid in the first quarter of 2024. Electricity requirements for the mine are expected to ramp up in late 2025, following the first mine production in the third quarter of 2025.

Chart 14 shows the industrial requirements for the three forecast scenarios for the Island Interconnected System. Additional Industrial customer growth is only assumed in the Accelerated Electrification scenario, which assumes there will be higher requirements from additional new projects.

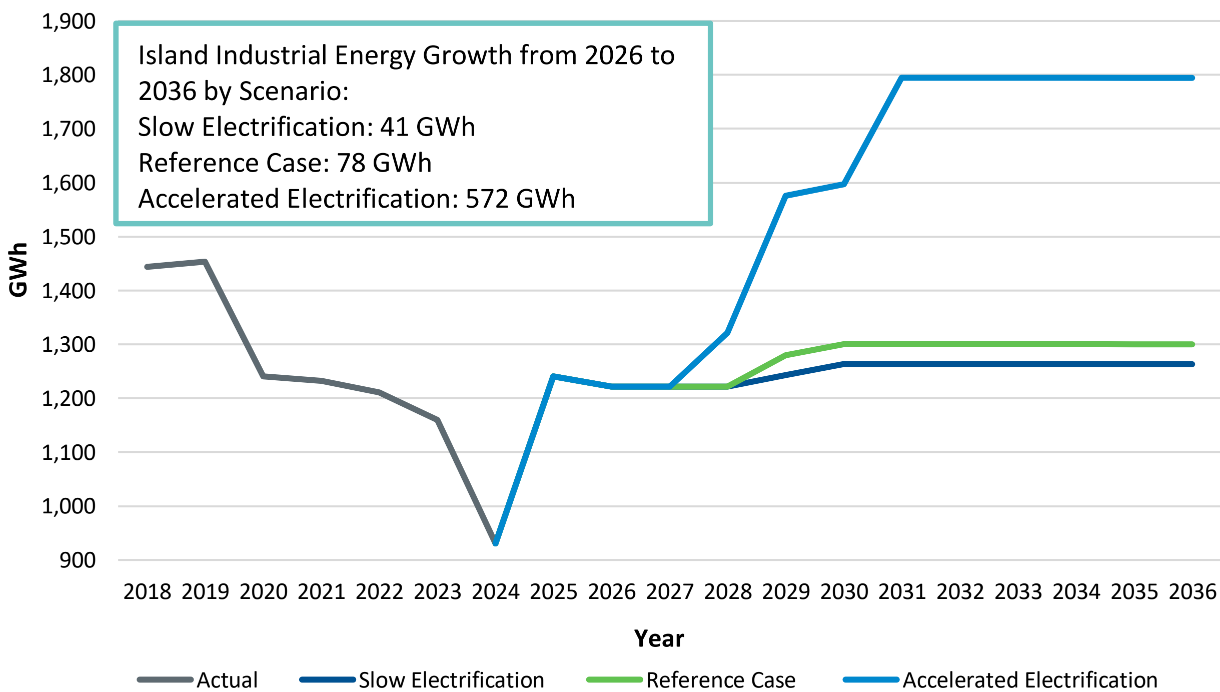


Chart 14: Island Industrial Customers Total Energy Requirements[76]

[75] Accelerated Electrification of 3,113 GWh minus Slow Electrification of 2,875 GWh = 238 GWh.
[76] Historical values are not weather-normalized.

5.0 2024 versus 2025 Load Forecasts

5.1 Customer Demand Comparison

As shown in Chart 15, customer demand in the Slow Electrification and Reference Cases in 2025 is virtually the same as that in 2024.

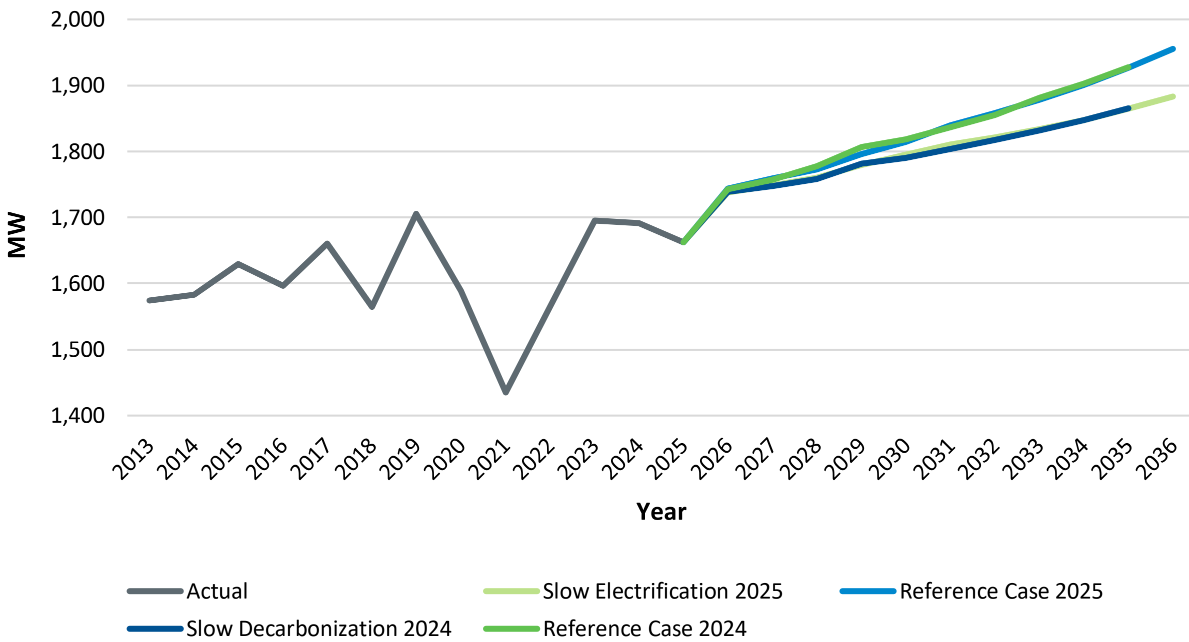


Chart 15: **Island Interconnected System Annual Customer Coincident Demand Requirements Comparisons**[77,78,79,80]

While the total demand in 2035 is comparable between both the 2024 and 2025 Reference Cases, the components of the load are different in 2025. The 2025 Reference Case sees a higher percentage of Utility load compared to the 2024 Reference Case. Increases in Utility load stem from a reassessment by Newfoundland Power of customers that use electric heat, as well as increased housing starts compared to 2024. Industrial load is lower in 2025 compared to 2024 due to a forecast decline in industrial growth as well as a decrease in the number of Industrial customers.

[77] The Island Interconnected System annual customer coincident demand is reflective of the total Island Interconnected System demand less transmission losses and station service load.
[78] Historical values are not weather-normalized.
[79] The significant decline in demand in 2020 and 2021 was due to the effects of the COVID-19 pandemic.
[80] 2025 Peak is year-to-date.

Figure 7 and Figure 8 show the components that make up the total load in 2035 for the 2024 and 2025 Reference Cases, respectively.

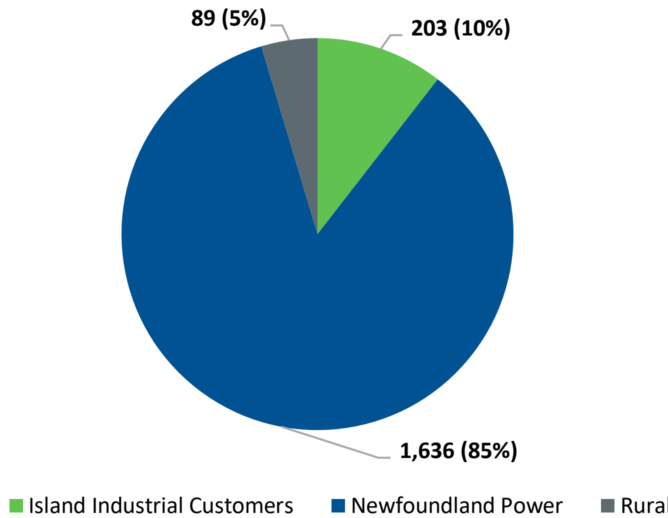


Figure 7: 2024 Reference Case

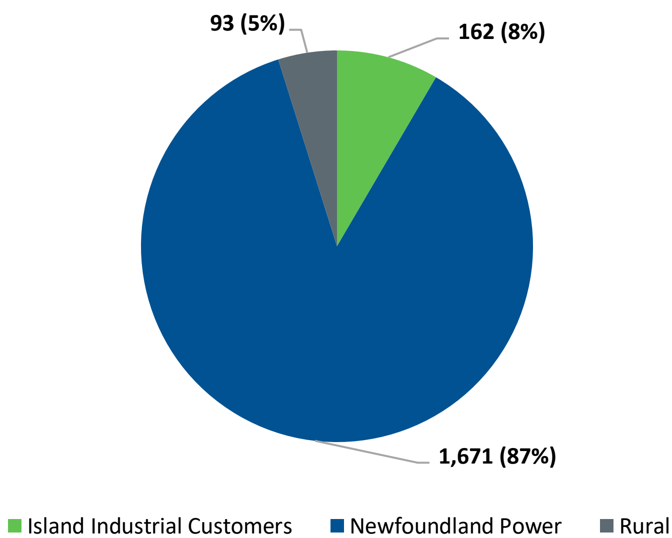


Figure 8: 2025 Reference Case

Similar to the Reference Case, the Slow Electrification case sees the same load in 2035 in both the 2025 forecast and the 2024 forecast, but with different components. Increases in Utility load in the 2025 load forecast stem from increased housing starts compared to the 2024 load forecast, as well as a continued increase in residential electrification initiatives. Lower industrial loads are due to the forecasted decrease in new growth, fewer Industrial customers. Figure 9 and Figure 10 show the components of the load in 2035 for the Slow cases.

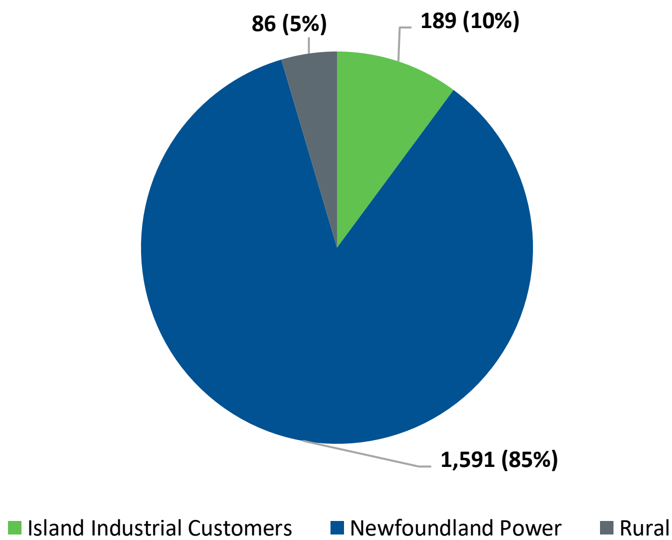


Figure 9: 2024 Slow Decarbonization

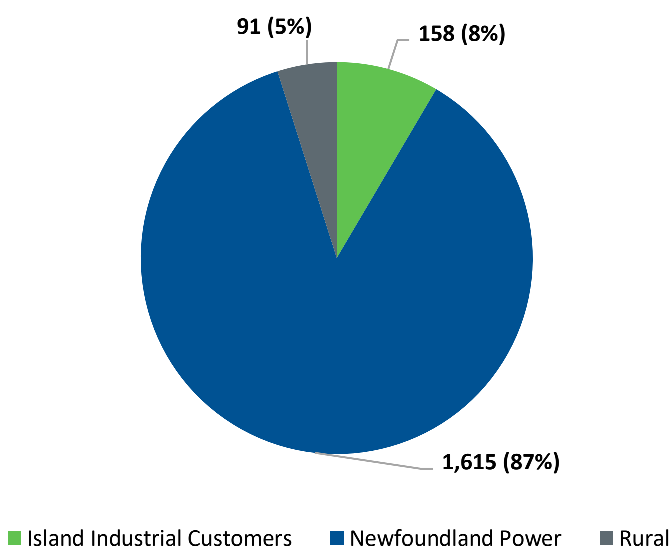


Figure 10: 2025 Slow Electrification

5.2 Energy Requirements Comparison

As shown in Chart 16, the Slow Electrification and Reference Case in 2025 are similar to those from 2024, with the 2025 cases being slightly lower than the 2024 cases.

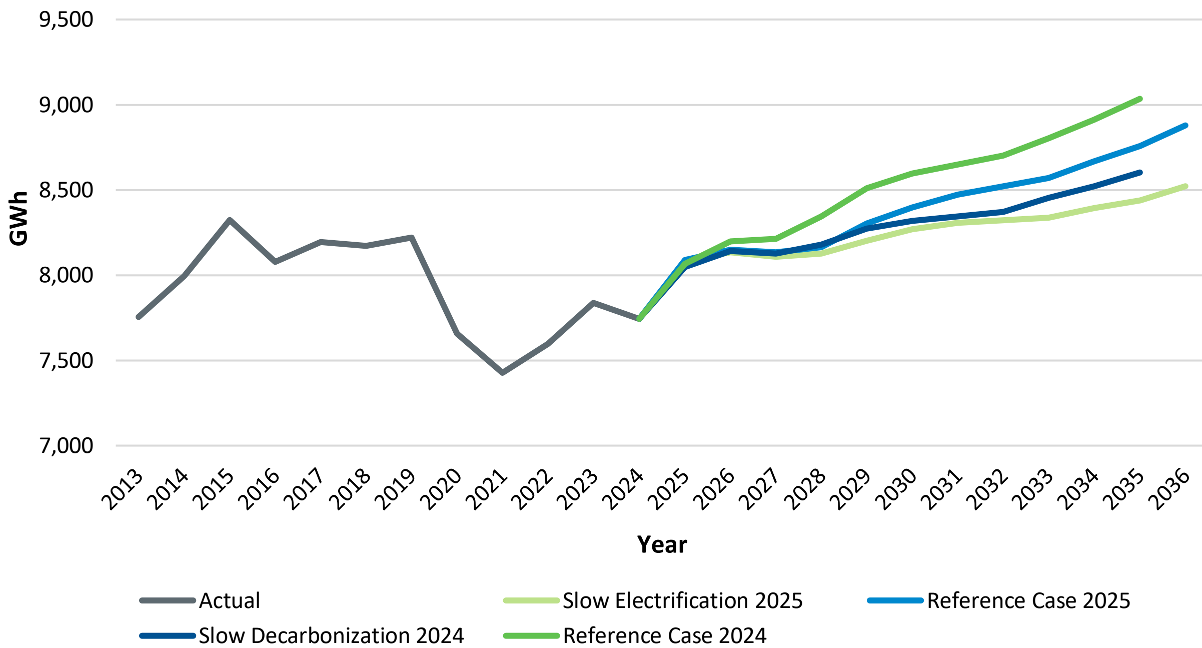


Chart 16: **Island Interconnected System Annual Energy Requirements Comparisons**[81,82]

The 2025 energy forecast has slightly less energy consumption in both the Slow Electrification and Reference Cases when compared to 2024. The 2025 Reference Case load forecast energy reduced by 3.1%, or 276 GWh by 2035, compared to the energy requirement identified in the 2024 Reference Case load forecast. In addition, the 2025 Slow Electrification load forecast decreased by 1.9%, or 164 GWh by 2035, as compared to the energy requirement calculated for the 2024 Slow Decarbonization load forecast. The slight decline is reflective of updated lower industrial load, technology changes, such as MSHPs and lower economic indicators compared to 2024.

[81] Historical values are not weather-normalized.
[82] The significant decline in energy in 2020 and 2021 was due to the effects of the COVID-19 pandemic.

6.0 Conclusion

Planning is a dynamic process which requires the analysis of a variety of scenarios that reflect the range of possibilities for key drivers to better understand both the resource adequacy risks as well as the potential methods to help mitigate the risks. Hydro adheres to this aspect of resource planning practice by considering several scenarios that address expected and potential expectations for economic growth and Government decarbonization policies and programs. As noted during Daymark's independent review conducted in 2023, Hydro's load forecast methodology reflects standard industry approaches for assessing potential growth.[83] As noted previously, the parties to the 2024 Resource Adequacy Plan agreed that the load forecast methodology used by Hydro in the 2023 Load Forecast is consistent with utility industry standards; the 2025 Load Forecast utilizes the same methodology.

Government policy and programming in Canada and Newfoundland and Labrador are continuing to influence a transformation of the Newfoundland and Labrador electric power systems. Governments have increased their investment in the housing industry to deal with the current shortage of housing in the province. The forecasts presented highlight the broad range of future alternatives, primarily based on the variation and uncertainty around decarbonization, which impacts the timing and extent of electrification activities. Combined with the recent population growth in the province, this could continue to drive higher economic growth.

The Slow Electrification scenario is forecasting additional demand of 146 MW and 0.4 TWh of energy required by 2036. Compared to the 2024 Slow Decarbonization scenario, the demand is the same by 2035, but as in the Reference Case, the components of demand are slightly different, as shown in Figure 9 and Figure 10. As the Island Interconnected System is currently capacity-constrained, reliability concerns remain. Given the timeframe to construct new assets, it is imperative to approve new resource options in a timely manner to maintain a reliable electricity system. Therefore, the 2025 Load Forecast continues to support the Minimum Investment Required Expansion Plan as recommended by Hydro within its 2024 Resource Adequacy Plan, and the construction and installation of the Bay d'Espoir Unit 8 and Avalon Combustion Turbine as proposed in the 2025 Build Application currently before the Board.

[83] "R&RA 2024: Independent Load Forecasting Process Review," Daymark Energy Advisors, March 22, 2024, sec. II(C), p. 15.

Hydro remains committed to annually updating the load forecast and creating additional scenarios to reflect changes in the planning environment to support future resource planning analysis. As is the case with all forecasting analyses, improvements in the underlying methodologies are expected and planned to occur in each successive forecast update to reflect new information and industry changes. Annual updates will also address the emergence of additional information on customer adoption of policy-driven programs, large load requests, responses to pricing, and the general economic climate.

Attachment 1

Supporting Tables

Table 1: 2025 Planning Load Forecast – Reference Case
Primary Forecast Inputs and Island Interconnected System Utility Impacts

Economic Forecast	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Gross Domestic Product (2012$, MM)[1]	23,987	23,872	24,227	24,116	23,931	23,517	23,469	23,376	23,266	22,809	22,668
Growth Rate . . . (%)	-2.6	-0.5	1.5	-0.5	-0.8	-1.7	-0.2	-0.4	-0.5	-2.0	-0.6
Household Disposable Income (2012$, MM)	13,883	13,916	14,061	14,142	14,141	14,114	14,164	14,167	14,145	14,067	14,036
Growth Rate . . . (%)	0.0	0.2	1.0	0.6	0.0	-0.2	0.4	0.0	-0.2	-0.6	-0.2
Commercial Bldg. Investment (2012$, MM)	625	552	511	497	488	486	483	479	476	472	468
Growth Rate . . . (%)	-8.6	-11.7	-7.5	-2.7	-1.9	-0.4	-0.7	-0.7	-0.7	-0.8	-0.9
Housing Starts	2,196	2,301	2,329	2,343	2,320	2,193	2,043	1,922	1,780	1,687	1,578
Population (000's)	548	548	550	552	552	550	547	544	540	536	531

Island Interconnected Utility Impacts[2]	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Domestic Customers (000's)	266	268	271	273	275	278	280	282	284	285	287
Domestic Sales (GWh)	3,957	3,923	3,927	3,981	4,028	4,076	4,084	4,089	4,132	4,166	4,213
Growth Rate . . . (%)	-0.4	-0.9	0.1	1.4	1.2	1.2	0.2	0.1	1.1	0.8	1.1
Electric Heat Market Share (%)	77	77	78	79	79	80	80	80	80	81	81
General Service Customer Sales (GWh)	2,592	2,610	2,638	2,659	2,683	2,707	2,745	2,787	2,837	2,889	2,956
Growth Rate . . . (%)	3.8	0.7	1.0	0.8	0.9	0.9	1.4	1.5	1.8	1.8	2.3
Street & Area Lighting Sales (GWh)	21	19	19	19	19	19	19	19	19	19	19
Distribution Losses (GWh)[3]	359	358	359	363	367	371	373	376	380	385	391
Total Utility Requirements (GWh)	6,928	6,910	6,943	7,023	7,097	7,173	7,221	7,270	7,368	7,459	7,579
Growth Rate . . . (%)	1.2	-0.3	0.5	1.1	1.1	1.1	0.7	0.7	1.3	1.2	1.6

Table 2: 2025 Planning Load Forecast – Slow Electrification Scenario
Primary Forecast Inputs and Island Interconnected System Utility Impacts

Economic Forecast	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Gross Domestic Product (2012$, MM)[4]	23,987	23,872	24,227	24,116	23,931	23,517	23,469	23,376	23,266	22,809	22,668
Growth Rate . . . (%)	-2.6	-0.5	1.5	-0.5	-0.8	-1.7	-0.2	-0.4	-0.5	-2.0	-0.6
Household Disposable Income (2012$, MM)	13,883	13,916	14,061	14,142	14,141	14,114	14,164	14,167	14,145	14,067	14,036
Growth Rate . . . (%)	0.0	0.2	1.0	0.6	0.0	-0.2	0.4	0.0	-0.2	-0.6	-0.2
Commercial Bldg. Investment (2012$, MM)	625	552	511	497	488	486	483	479	476	472	468
Growth Rate . . . (%)	-8.6	-11.7	-7.5	-2.7	-1.9	-0.4	-0.7	-0.7	-0.7	-0.8	-0.9
Housing Starts	2,196	2,301	2,329	2,343	1,221	1,229	1,234	1,240	1,245	1,201	1,201
Population (000's)	548	548	550	552	552	550	547	544	540	536	531

Island Interconnected Utility Impacts[5]	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Domestic Customers (000's)	266	268	271	273	274	275	277	278	279	281	282
Domestic Sales (GWh)	3,944	3,902	3,899	3,933	3,956	3,971	3,958	3,941	3,958	3,961	3,989
Growth Rate . . . (%)	-0.7	-1.1	-0.1	0.9	0.6	0.4	-0.3	-0.4	0.4	0.1	0.7
Electric Heat Market Share (%)	77	77	78	78	79	79	79	80	80	80	80
General Service Customer Sales (GWh)	2,589	2,606	2,630	2,648	2,667	2,688	2,716	2,747	2,785	2,824	2,875
Growth Rate . . . (%)	3.7	0.6	0.9	0.7	0.7	0.8	1.1	1.2	1.4	1.4	1.8
Street & Area Lighting Sales (GWh)	21	19	19	19	19	19	19	19	19	19	19
Distribution Losses (GWh)[6]	358	357	358	360	362	364	365	366	369	371	375
Total Utility Requirements (GWh)	6,912	6,884	6,906	6,961	7,005	7,042	7,058	7,073	7,131	7,175	7,259
Growth Rate . . . (%)	1.0	-0.4	0.3	0.8	0.6	0.5	0.2	0.2	0.8	0.6	1.2

[1] Adjusted GDP excludes production related income earned by the non-resident owners of mining, oil, and gas projects.
[2] Includes Newfoundland Power and Hydro Rural.
[3] Includes company use.
[4] Adjusted GDP excludes production related income earned by the non-resident owners of mining, oil, and gas projects.
[5] Includes Newfoundland Power and Hydro Rural.
[6] Includes company use.

Table 3: 2025 Planning Load Forecast – Accelerated Electrification Scenario Primary Forecast Inputs and Island Interconnected System Utility Impacts

Economic Forecast	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Gross Domestic Product (2012$, MM)[7]	24,024	24,087	25,639	27,228	28,152	26,856	27,362	27,152	26,623	24,633	24,136
Growth Rate . . . (%)	-2.9	0.3	6.4	6.2	3.4	-4.6	1.9	-0.8	-1.9	-7.5	-2.0
Household Disposable Income (2012$, MM)	13,886	13,960	14,400	14,821	15,176	15,158	15,565	15,677	15,490	15,055	14,936
Growth Rate . . . (%)	0.0	0.5	3.2	2.9	2.4	-0.1	2.7	0.7	-1.2	-2.8	-0.8
Commercial Bldg. Investment (2012$, MM)	626	553	518	512	508	503	503	501	496	486	480
Growth Rate . . . (%)	-8.6	-11.6	-6.4	-1.2	-0.8	-1.0	0.0	-0.4	-1.0	-2.0	-1.4
Housing Starts	2,199	2,302	2,337	2,401	2,442	2,398	2,282	2,278	2,200	2,109	1,951
Population (000's)	548	549	551	556	564	572	576	580	582	581	575

Island Interconnected Utility Impacts[8]	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Domestic Customers (000's)	266	268	271	273	276	278	280	283	285	287	289
Domestic Sales (GWh)	3,977	3,981	4,046	4,171	4,304	4,426	4,517	4,587	4,636	4,703	4,790
Growth Rate . . . (%)	-0.2	0.1	1.7	3.1	3.2	2.8	2.1	1.6	1.1	1.4	1.9
Electric Heat Market Share (%)	77	78	80	81	82	83	83	84	84	84	85
General Service Customer Sales (GWh)	2,597	2,622	2,673	2,726	2,780	2,810	2,870	2,925	2,983	3,034	3,113
Growth Rate . . . (%)	3.8	1.0	1.9	2.0	2.0	1.1	2.1	1.9	2.0	1.7	2.6
Street & Area Lighting Sales (GWh)	21	19	19	19	19	19	19	19	19	19	19
Distribution Losses (GWh)[9]	360	362	368	377	387	395	403	409	415	421	430
Total Utility Requirements (GWh)	6,956	6,984	7,106	7,293	7,489	7,650	7,809	7,941	8,054	8,177	8,352
Growth Rate . . . (%)	1.3	0.4	1.7	2.6	2.7	2.1	2.1	1.7	1.4	1.5	2.1

Table 4: 2025 Planning Load Forecasts Island Interconnected System Load Summary[10]

Slow Electrification Case	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Total Island Requirements (GWh)	8,134	8,106	8,128	8,203	8,268	8,306	8,322	8,337	8,394	8,438	8,522
Growth Rate . . . (%)	0.6	-0.3	0.3	0.9	0.8	0.5	0.2	0.2	0.7	0.5	1.0
Island Customer Coincident Peak Demand (MW)	1,738	1,749	1,760	1,779	1,795	1,810	1,821	1,834	1,848	1,865	1,883
Growth Rate . . . (%)	3.7	0.7	0.6	1.1	0.9	0.9	0.6	0.7	0.7	0.9	1.0

Reference Case	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Total Island Requirements (GWh)	8,150	8,133	8,165	8,302	8,398	8,474	8,522	8,571	8,669	8,759	8,879
Growth Rate . . . (%)	0.8	-0.2	0.4	1.7	1.2	0.9	0.6	0.6	1.1	1.0	1.4
Island Customer Coincident Peak Demand (MW)	1,744	1,759	1,773	1,796	1,814	1,839	1,858	1,878	1,901	1,927	1,955
Growth Rate . . . (%)	4.0	0.9	0.8	1.3	1.0	1.4	1.0	1.1	1.2	1.4	1.5

Accelerated Electrification Case	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Total Island Requirements (GWh)	8,178	8,206	8,427	8,869	9,086	9,445	9,603	9,736	9,848	9,971	10,147
Growth Rate . . . (%)	0.9	0.3	2.7	5.2	2.4	3.9	1.7	1.4	1.2	1.2	1.8
Island Customer Coincident Peak Demand (MW)	1,751	1,769	1,810	1,885	1,918	1,996	2,025	2,059	2,092	2,132	2,170
Growth Rate . . . (%)	4.3	1.0	2.3	4.1	1.7	4.1	1.5	1.7	1.6	1.9	1.8

7 Adjusted GDP excludes production related income earned by the non-resident owners of mining, oil, and gas projects.

8 Includes Newfoundland Power and Hydro Rural.

9 Includes company use.

10 Exclusive of transmission losses and station service loads.

Table 5: Island Interconnected System Average Domestic Rate Forecast – Excluding HST (cents/kWh)[11]

Year	Reference and Accelerated	Slow Case
2025	15.71	15.71
2026	16.81	16.81
2027	17.69	17.69
2028	18.18	18.23
2029	18.58	18.77
2030	19.00	19.32
2031	19.95	20.29
2032	20.95	21.30
2033	22.00	22.37
2034	23.10	23.48
2035	24.25	24.66
2036	25.47	25.89

Table 6: Island Interconnected System Cumulative EV Sales

	Slow Electrification Scenario		Reference Case		Accelerated Electrification Scenario	
	LDVs	**Medium- and Heavy-Duty Vehicles and Buses**	**LDVs**	**Medium- and Heavy-Duty Vehicles and Buses**	**LDVs**	**Medium- and Heavy-Duty Vehicles and Buses**
2025	3,203	125	3,700	152	5,625	224
2026	4,540	195	5,935	249	8,898	382
2027	6,374	279	9,350	380	13,391	670
2028	8,942	401	13,885	551	19,405	1,024
2029	12,519	579	19,478	796	27,397	1,459
2030	17,481	819	26,234	1,125	38,555	1,989
2031	24,089	1,138	34,527	1,545	53,266	2,633
2032	32,583	1,552	45,028	2,131	71,503	3,408
2033	42,975	2,057	58,227	2,832	92,445	4,331
2034	54,753	2,664	74,315	3,662	115,247	5,419
2035	68,560	3,385	93,661	4,632	150,728	6,684
2036	84,551	4,229	115,717	5,749	185,890	8,135

[11] The rates provided herein are estimates based on assumptions made at a point in time. Actual customer rates could differ from those outlined herein for a variety of reasons, including assumptions around rate mitigation post-2030, actual customer load, rate increases associated with Newfoundland Power's costs, etc.

Attachment 2

NL EV Adoption and Impacts Study – Final Results

Dunsky Energy + Climate Advisors

April 2, 2024

NL EV Adoption and Impacts Study

Final Results

April 2, 2024


dunsky
Energy + Climate
ACCELERATING THE CLEAN ENERGY TRANSITION
ANALYSIS + STRATEGY
BUILDINGS
MOBILITY
INDUSTRY
ENERGY
19 Years
50+ Dedicated Professionals
700+ Projects across 31 States & Provinces

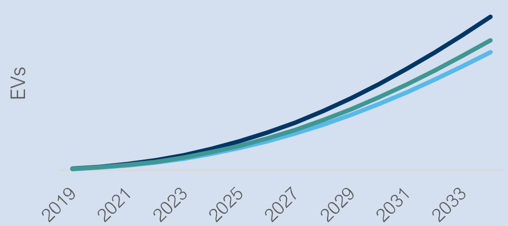

dunsky
Energy + Climate
ACCELERATING THE CLEAN ENERGY TRANSITION
ANALYSIS + STRATEGY
BUILDINGS
MOBILITY
INDUSTRY
ENERGY
GOVERNMENTS
UTILITIES
CORPORATE + NON-PROFIT

Methodology

Approach

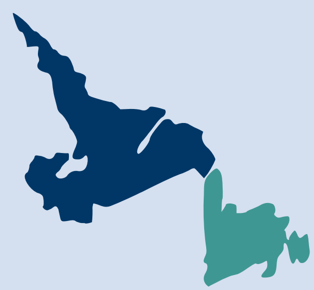
The study follows the following three steps to assess the potential impacts of EVs within Newfoundland and Labrador. Key aspects of the study approach are highlighted throughout the report.

Forecast EV Adoption



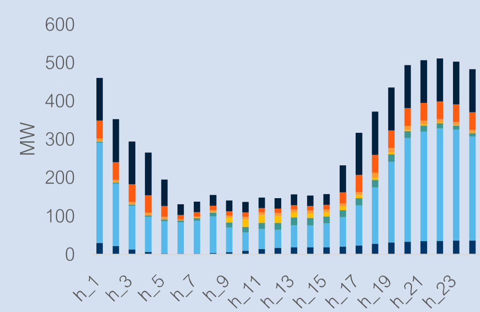
Using Dunsky's Electric Vehicle Adoption (EVA) model, forecast EV uptake within the province under various scenarios reflecting different policy, program and technology conditions.

Develop Regional Projections



Estimate EV adoption across two provincial zones based on high-impact factors likely to influence regional variation in EV adoption.

Assess Load Impacts



Assess the energy (GWh) and peak demand (MW) impacts associated with EV charging loads

4

Methodology

Approach: EVA Model

The study leverages Dunsky's Electric Vehicle Adoption (EVA) Model to forecast the uptake of EVs.

EVA powered by dunsky

TECHNICAL

Assess the maximum theoretical potential for deployment
- Market size and composition by vehicle class (e.g. cars, trucks, buses)
- Model availability for each vehicle powertrain (e.g. ICE, PHEV, BEV)

ECONOMIC

Calculate unconstrained economic potential uptake
- Incremental purchase cost of PHEV/BEV over ICE vehicles
- Total Cost of Ownership (TCO) (personal) or Internal Rate of Return (IRR) (commercial) based on operational and fuel costs

CONSTRAINTS

Account for jurisdiction-specific barriers and constraints
- Range anxiety or range requirements
- Public charging coverage, availability, and charging time
- Home charging access

MARKET

Incorporate market dynamics and non-quantifiable market constraints
- Use of technology diffusion theory to determine rate of adoption
- Market competition between vehicles types (PHEV vs. BEV)

5

Methodology

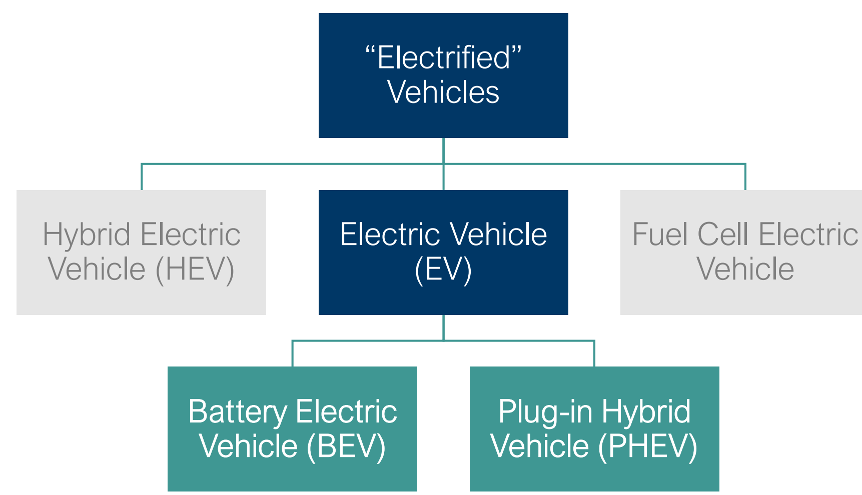
Defining Electric Vehicles

The EV analysis considers *plug-in* electric vehicles. Specifically, it considers the following vehicle types:

- **Battery electric vehicles (BEV):** "pure" electric vehicles that only have an electric powertrain and that must be plugged into an electric source to charge (*e.g.*, Tesla Model 3, Hyundai Kona, Volkswagen ID).
- **Plug-in hybrid electric vehicles (PHEV):** vehicles that can plug in to charge and operate in electric mode for short distances (*e.g.*, 30 to 80 km), but that also include a combustion powertrain for longer trips.

The following vehicle types are excluded from the analysis:

- **Hybrid electric vehicles** that do not plug in are considered internal combustion engine (ICE) vehicles.
- **Fuel cell electric vehicles** such as hydrogen vehicles where the market is assumed to be minimal in the timeframe of the study.

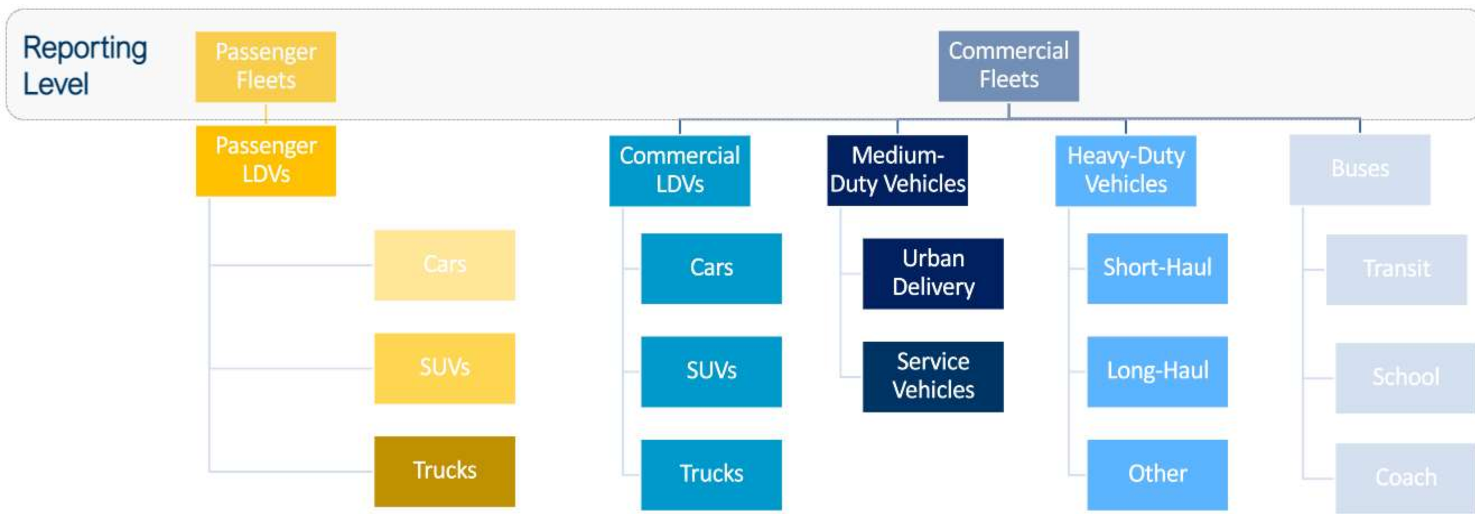


Methodology

Defining Vehicle Segments

Multiple vehicle classification systems exist, however, for the purpose of this study, we break down the on-road vehicle market into several key segments that share common characteristics

- Results are broken down into for light-, medium-, heavy- duty vehicles and buses
- More granular vehicle sub-segments were used in the modeling to capture vehicle segments with distinct factors that may impact EV adoption (e.g. limited availability of EV model, unique driving patterns or technical needs, etc.)



* The study does not model commercial light-duty vehicle segment distinctly. The analysis of light-duty vehicles focuses on the personal vehicle market (the majority light-duty vehicle market) and assumes that the commercial vehicle market follows a similar trajectory,

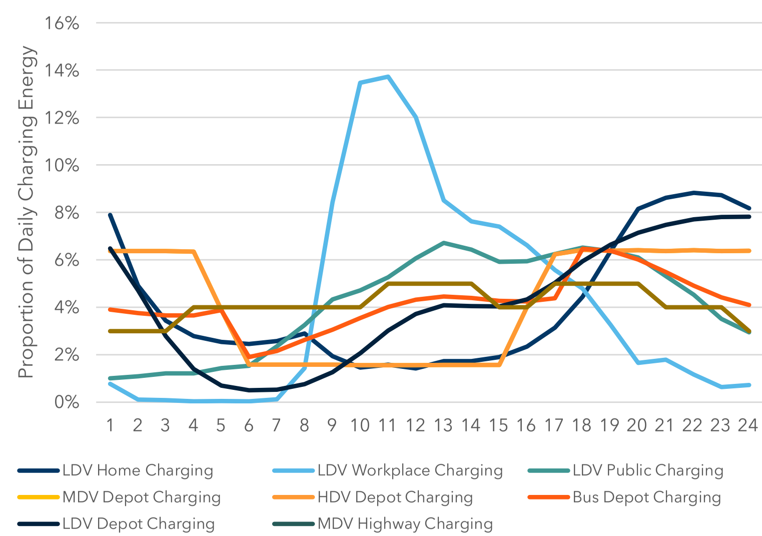
Electric Vehicle Forecast

Charging Load Profiles

Charging event types refer to the location that charging is taking place at, which will change the power level, time of day, and flexibility of the charging load.

Charging Event Type	Passenger LDV	Commercial LDV	MDV	HDV	Bus
Home	80%	NA	NA	NA	NA
Workplace	10%	NA	NA	NA	NA
Public	10%	NA	NA	NA	NA
Depot	NA	100%	100%	100%	100%

EV load is assessed using **24-hour diversified charging distribution profiles**. The distribution profiles are then scaled to daily energy requirements for each segment.



The charging distribution profiles were developed by leveraging data sets from a range of government and utility-led pilot programs including: California Energy Commission. California Investor-Owned Utility Electricity Load Shapes; ISO New England 2020 Transportation Electrification Forecast; Rocky Mountain Institute. DCFC Rate Design Study. 2019.

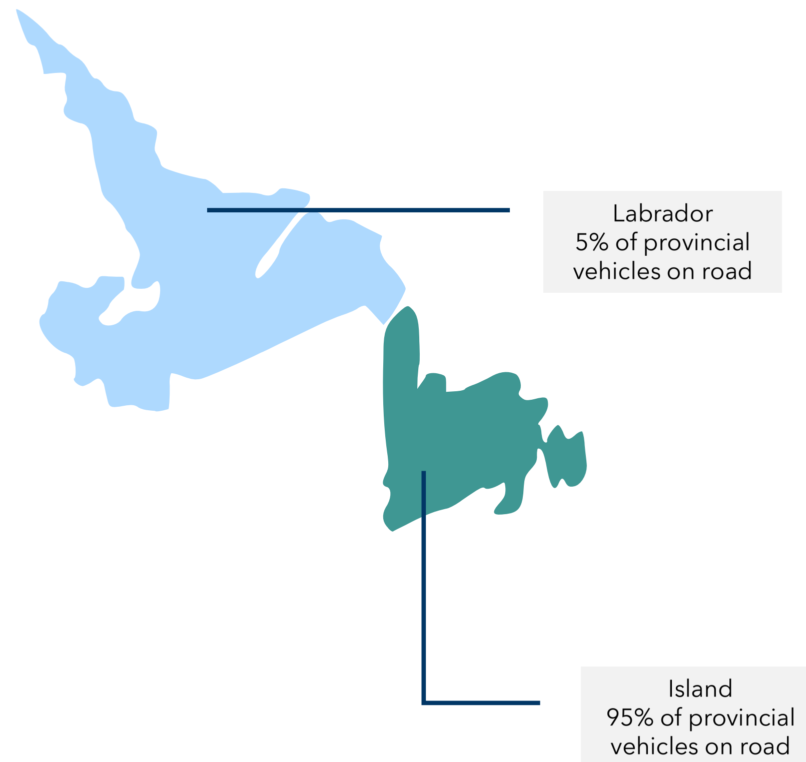
Methodology

Regional Disaggregation

The province-wide adoption forecast is disaggregated into two regions to estimate the geographic distribution of EV adoption within the province, based on five high-impact factors most likely to influence regional variation in EV uptake.

- Number of vehicles
- Historic EV sales
- Housing composition
- Income levels
- Driving distance

Data on EV annual sales and EVs on the road historically in Labrador and the Island is limited (data available at the province wide level). It is assumed that minimal EV adoption to date has occurred in Labrador to date.



Agenda

1 Introduction

2 Methodology

3 **Market Characterization**

4 Results

5 Question & Next Steps

Market Characterization

Vehicle Market

Approximately 414,000 vehicles are on the road in Newfoundland and Labrador

- Light-duty vehicles (LDVs), both personal and commercial, represent 93% of vehicles (386,000 vehicles on the road).
- Medium-and heavy-duty vehicles (MHDVs) represent the remaining 7% of vehicles (27,000 vehicles on the road).

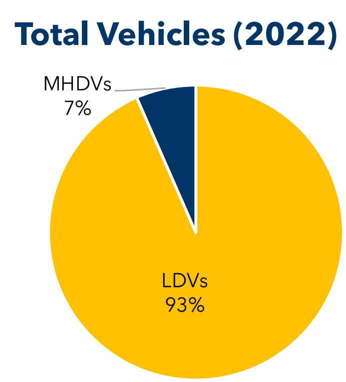
Approximately 27,000 new LDVs are estimated to be registered annually in the region

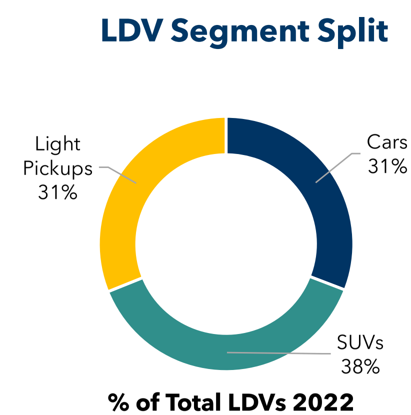
- Majority (90%) of LDVs assumed predominantly passenger/personal use, with the remaining being commercial/institutional fleets.
- SUVs and Pickups make up 80% of new vehicle sales, and 69% of vehicles currently in circulation, reflecting an ongoing trend towards SUVs and light-duty trucks.

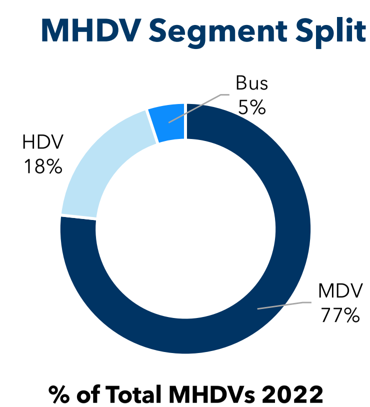
Approximately 2,050 new MHDVs are estimated to be registered annually

- Medium-Duty Vehicles make up 77% of MHDVs in circulation

The estimated vehicle market sizes used in the study represent the project team's best judgement based on analysis of data from NRCan's Comprehensive Energy Use Database (LDV and MHDV registrations) and Statistics Canada Newfoundland and Labrador Vehicle registrations (sub-segment percentage split).







Market Characterization

Electric Vehicle Market

EV Adoption in Newfoundland and Labrador (NL) significantly lags behind other Canadian provinces

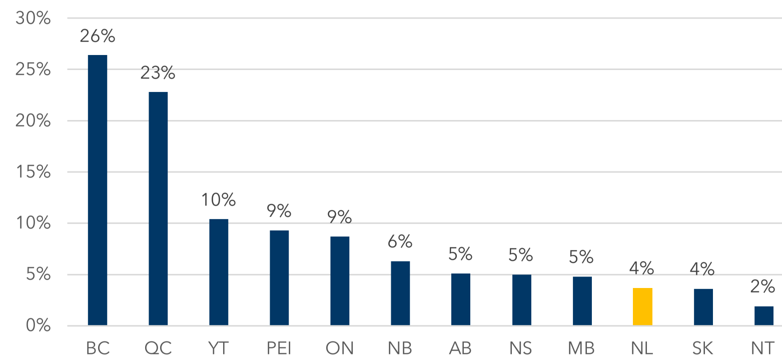
- Approximately 950 EVs registered (2022) in the province
- EVs represent 4% of new vehicle sales (2023)
    - Up from 0.3% of new vehicle sales (2020)

In NL, EV adoption increased starting in 2018 with significant jump in 2022

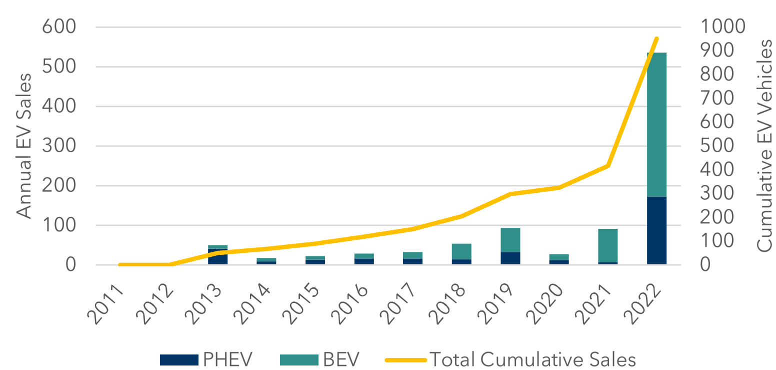
- A significant increase in uptake observed in 2018 (federal ZEV incentives began in 2019)
- Growth in BEV sales over the last 2 years (~80% BEVs)
- Limited uptake of EVs within the Medium and Heavy-Duty Vehicle (MHDV) segment

The estimated historic EV market sizes used in the study represent the project team's best judgement based on analysis of data from Statistics Canada Newfoundland and Labrador Vehicle registrations by fuel type (includes data on BEVs and PHEVs, non-plug-in hybrids are a separate segment).

Share of ZEV New Vehicle in Q3 '23 by Province and Territories[1]



Newfoundland and Labrador EV Sales (2011 - 2022)



[1] Canadian Automotive Insights: A curated collection of Canadian EV information, analysis and insights from S&P Global Mobility Q3 2023

Agenda

1 Introduction

2 Methodology

3 Market Characterization

4 **Results**

5 Questions & Next Steps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Overview

Overview

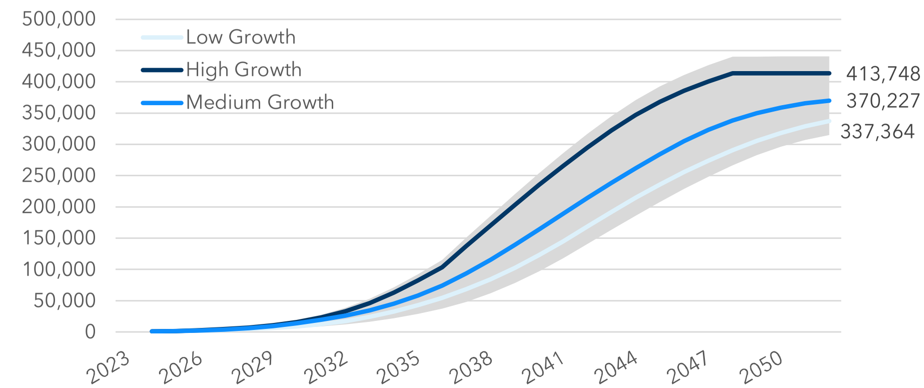
EV Adoption

The adoption of EVs in Newfoundland is forecasted to increase rapidly over the study period

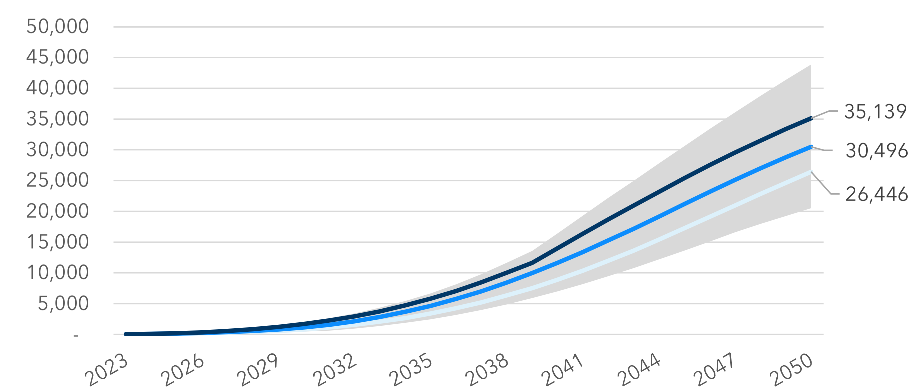
However, the degree of adoption will depend on the level of policy and program interventions in place to accelerate EV adoption.

- Without significant policy and program support, EV adoption in the province will be more limited in the Low Growth scenario, reaching about 337,000 EVs by 2050.
- The Medium and High growth scenarios will reach the same level by 2047 and 2041, respectively. That's approximately 9 years earlier for the High scenario compared to the Low scenario.
- Cumulative electric MHDVs are expected to increase more rapidly after 2035, reaching 35,000 by 2050 in the High Growth scenario and 26,500 EVs on the road in 2050 for the Low Growth Scenario.

LDV Cumulative Sales



MHDV Cumulative Sales



Load Impacts

Annual Load Impacts - Disaggregated

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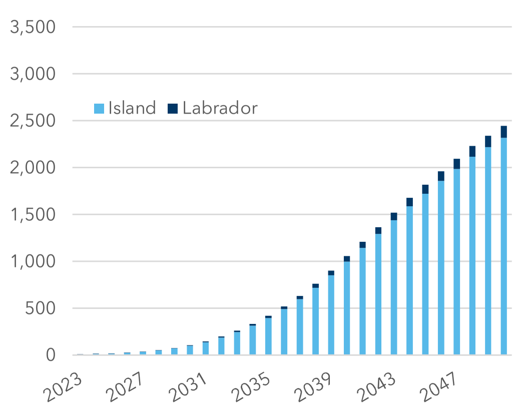
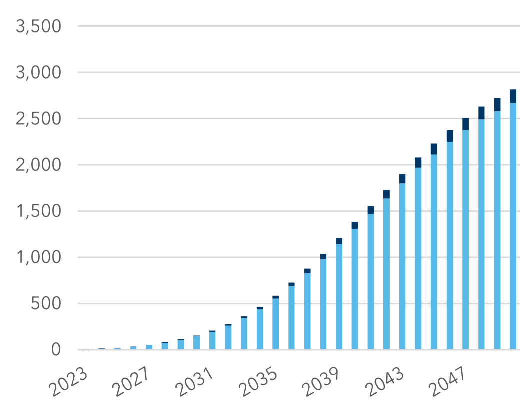
EV adoption per capita will be slightly higher in Labrador – accounting for 6% of EV GWh in 2024 despite representing only 5.2% of the provincial population. This is primarily drive by higher income and access to home charging.

Proportional EV adoption will be slightly higher in Labrador (5.2% of provincial population), accounting for ~6% of EV GWh in 2024 to ~5% in 2050. This is due to an ~ 2% higher % of fleet being EVs in passenger LDVs.

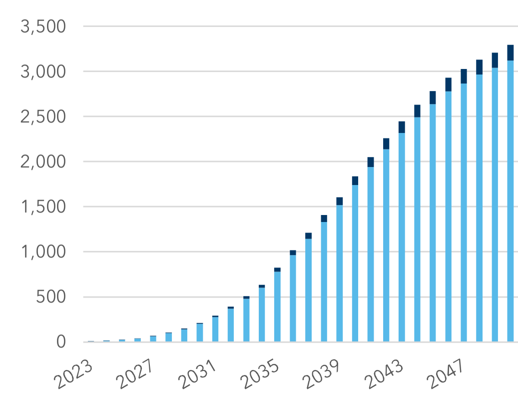
Low Growth (GWh)



Medium Growth (GWh)



High Growth (GWh)



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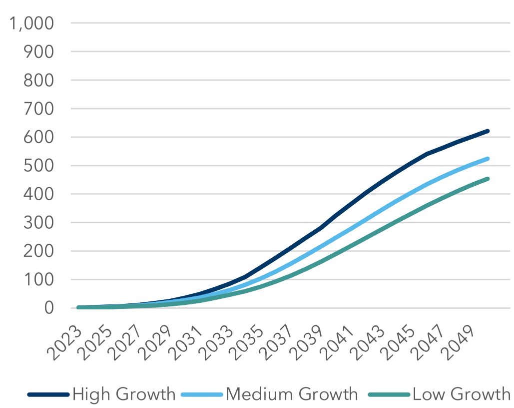
Load Impacts

Non-Coincident EV Peak Demand

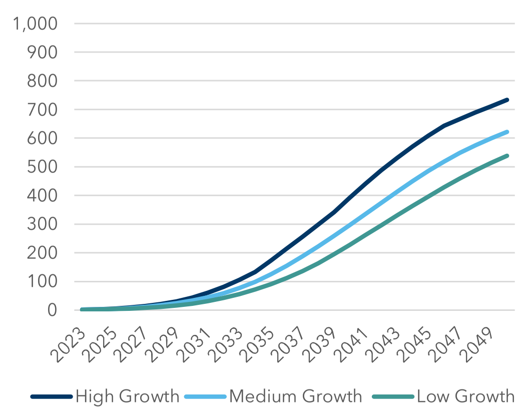
The effects of policy and technology from our scenario analysis can increase 2050 winter peak impacts from ~680 MW in the low scenario up to ~910 MW in the high scenario if no managed charging strategies are employed.

Cold winters can increase energy needs relative to summer primarily due to cabin heating requirements.[1] This accounts for the significant reduction in the EV charging peak in summer as compared to winter. The shoulder peak day lies roughly in the middle due to middle temperatures.

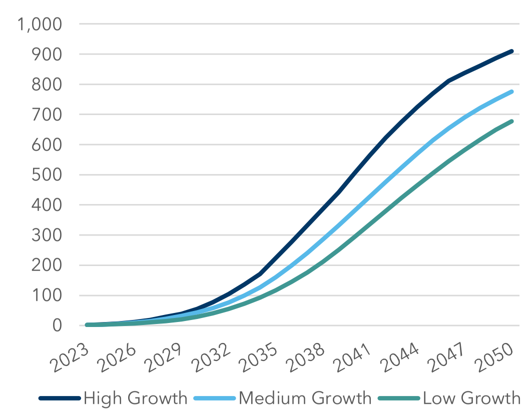
Summer Peak Day (MW)



Shoulder Peak Day (MW)



Winter Peak Day (MW)



[1] Geotab. *To what degree does temperature impact EV range?*

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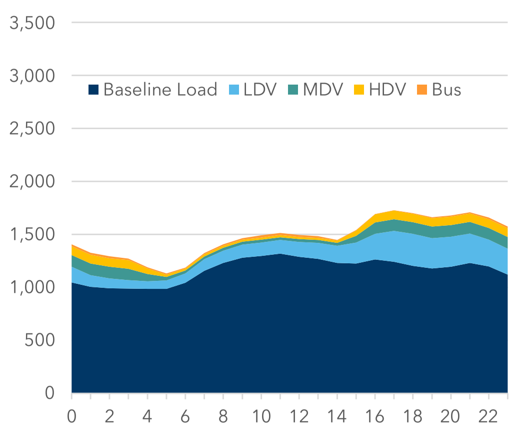
Load Impacts

EV Load Curve (High Growth, 2044) – Unmanaged

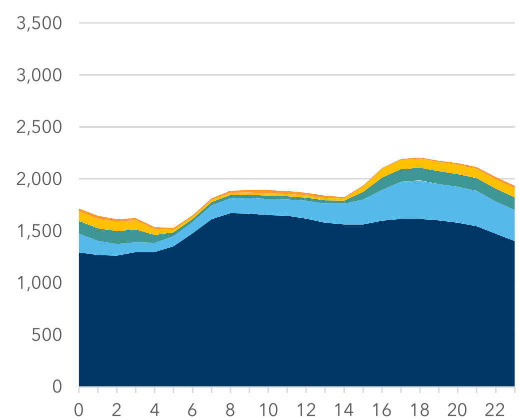
When applied to a typical peak winter day, passenger EVs will significantly increase peak demand and push the peak hour to later in the evening. This impact is primarily driven by home charging from LDVs.

If unmanaged, 2044 peak load for the NL Interconnected system in the winter (3055 MW) will shift from 6pm to 7pm (725 MW from EVs) and in summer (1728 MW) shift from 4pm to 5pm (485 MW from EVs).

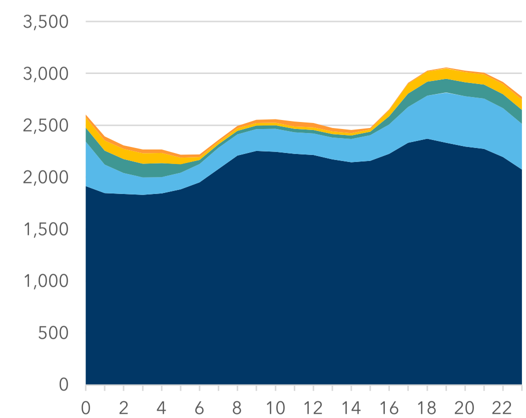
Summer Peak Day (MW)



Shoulder Peak Day (MW)



Winter Peak Day (MW)



[1] Geotab. To what degree does temperature impact EV range?

Load Impacts

Winter Peak Demand Impacts – Managed Charging

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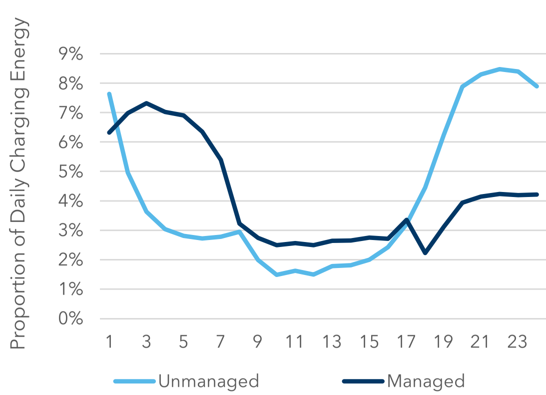
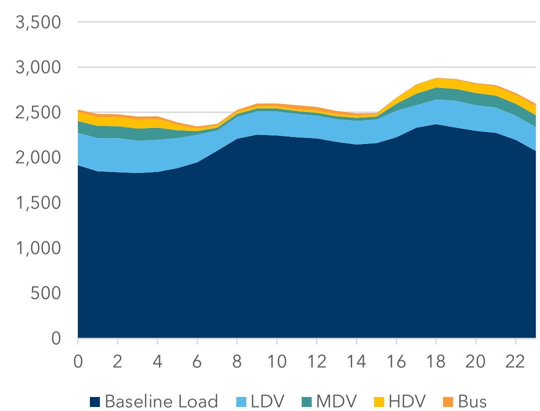
If **managed charging programs** and technologies are employed, peak load from EV charging has the potential to be reduced. The below load curve demonstrates a hypothetical managed charging scenario which assumes that only EVs which charge at home join the program, and 50% of those vehicles participate in load management on any given day.

Actual load management potential will depend highly on the local enrollment rate, incentives offered to participants, and technologies employed, but managed charging **could reduce the capacity required to serve EVs** (example below reduces 7pm winter peak in 2044 from 3055 MW to 2865 MW).

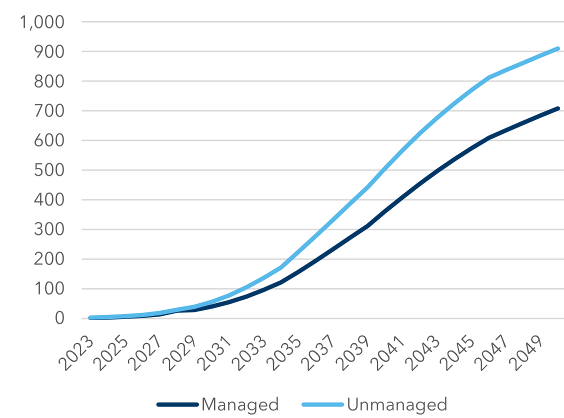
Individual Vehicle Load Curves (%)



Winter Peak Day 2044 (MW)



7pm Winter Peak Day (EV MW)



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Light-Duty Vehicles

Proposed Scenarios

Scenario Descriptions: Light-Duty Vehicles

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The adoption rate of electric vehicles will be assessed under three scenarios that vary policy and program interventions.

Low Growth	**Minimal efforts to support EV adoption.** • Assumes **limited new policies and programs** are put in place to support or incentivize electric vehicle adoption
Medium Growth	**Some support to enable EV adoption.** • Assumes **stronger policies/programs** are implemented that increase the adoption of electric vehicles (additional investment in infrastructure and incentives compared to the low growth scenario)
High Growth	**Strong policy pathway to reach Federal ZEV Target.** • Assumes **stringent policies/programs** are put in place to support or incentivize electric vehicle adoption

Proposed Scenarios

Scenarios: Light-Duty Vehicles

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Parameter	Scenario 1: **Low Growth**	Scenario 2: **Medium Growth**	Scenario 3: **High Growth**
Policy/Program Interventions			
Public charging infrastructure expansion	Limited *Planned investments + current growth trajectory*	Moderate *Planned investments + accelerated growth trajectory*	Significant *Keeps pace with adoption*
Vehicle incentives[1]	**BEVs:** \$7,500 **PHEVs:** \$5,250 *(Ramped down + phased-out by 2025)*	**BEVs:** \$7,500 **PHEVs:** \$5,250 *(Ramped down + phased-out by 2030)*	**BEVs:** \$10,000 **PHEVs:** \$7,500 *(Ramped down + phased-out by 2035)**
Existing building charging infrastructure retrofits	Limited *15% of multi-unit buildings with access to charging by 2035*	Moderate *40% of multi-unit buildings with access to charging by 2035*	Significant *90% of multi-unit buildings with access to charging by 2035*
ZEV Mandate	No ZEV mandate enforced	No ZEV mandate enforced	ZEV Mandate enforced in 2035

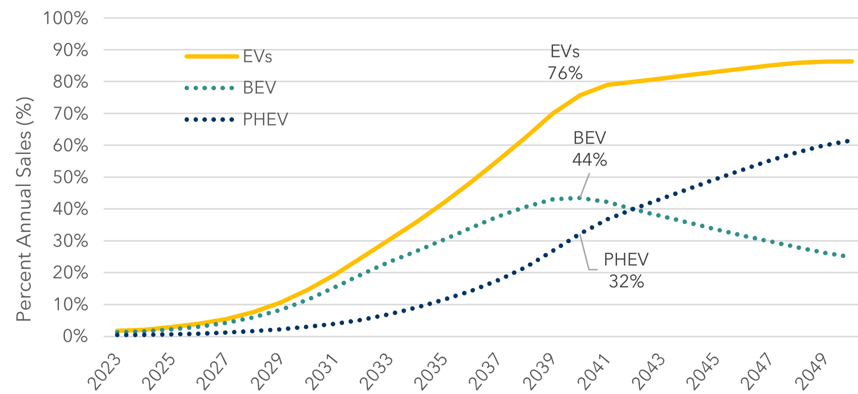
1. While significant EV incentives are unlikely through 2035, an ICE *feebate* could be put in place that penalizes carbon emitting vehicles would induce a similar financial incentive. Across all three scenarios, $150 tax per year on EV registrations will be applied starting 2025 + increase on inflation

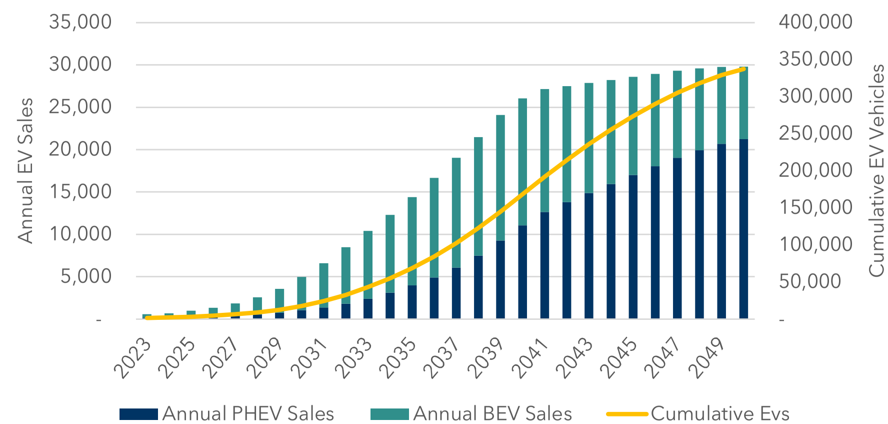
LDV Adoption

Low Growth Scenario

Under the Low Scenario, Newfoundland and Labrador will experience modest growth in EV uptake.

- By 2050, a total of 337,000 of the 414,000 LDVs on the road are forecasted to be EVs.
- EV adoption is expected to fall significantly short of federal 2035 ZEV targets (100%), reaching only 42% of new sales by 2035.
- Despite the growth in overall EV uptake, the market share shifts towards PHEVs by 2042 as public infrastructure deployment in this scenario is insufficient to meet needs of BEV drivers.





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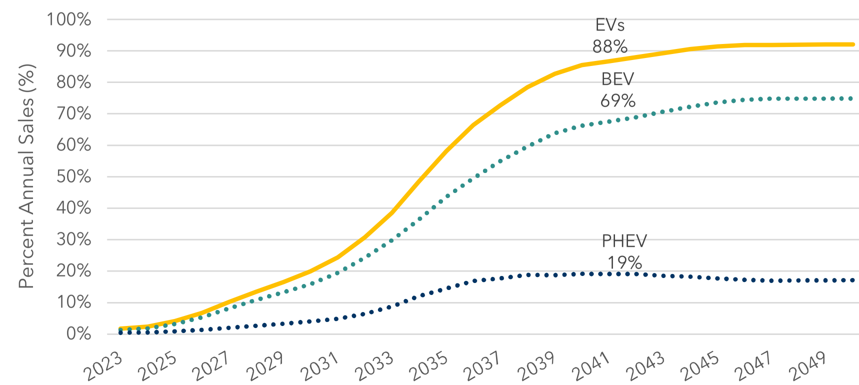
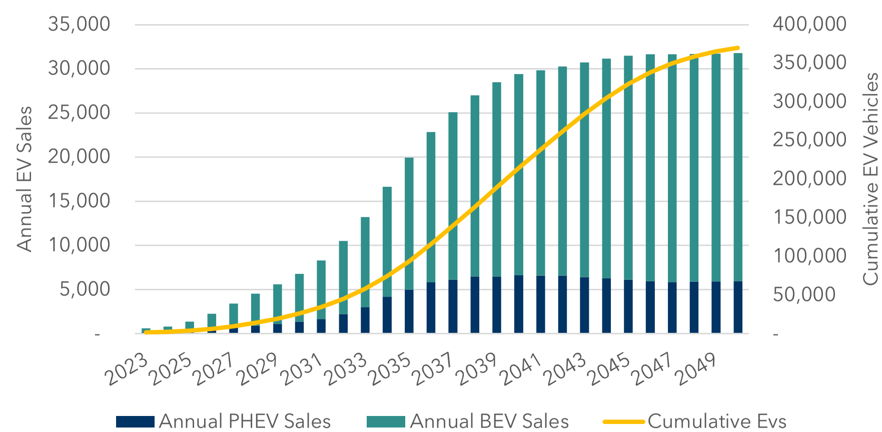
LDV Adoption

Medium Growth Scenario

Under the Medium Scenario, Newfoundland and Labrador will experience significant growth in EV uptake.

- By 2050, a total of 370,000 of the 414,000 LDVs on the road are forecasted to be EVs.
- EV adoption is still expected to fall short of federal 2035 ZEV targets (100%), reaching only 58% of new sales by 2035.
- With the more sufficient public charging infrastructure deployment assumed in this scenario, BEVs largely out-compete PHEVs due to lower total cost of ownership





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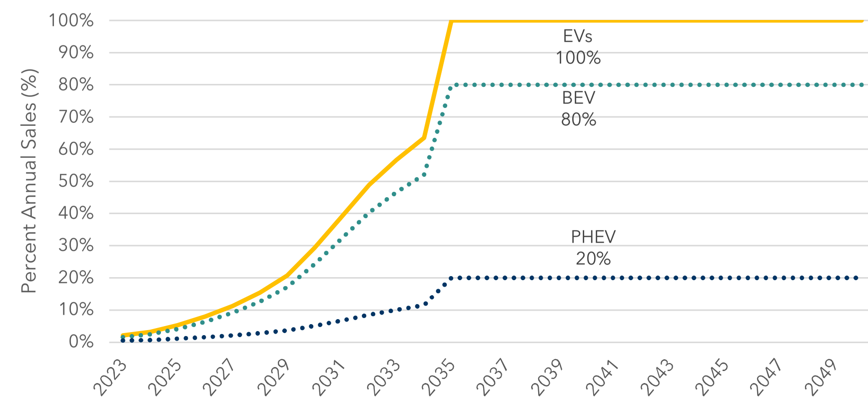
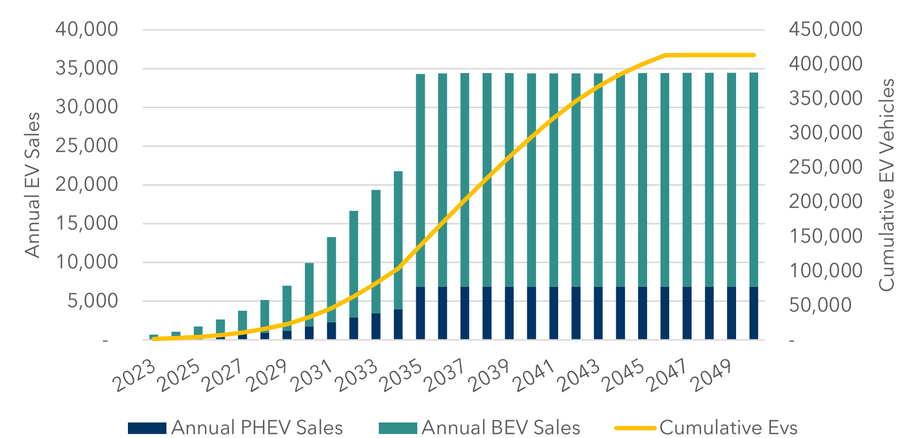
LDV Adoption

High Growth Scenario

Under the High Scenario, Newfoundland and Labrador will experience very significant growth in EV uptake.

- By 2050, almost all of the 414,000 LDVs on the road are forecasted to be Evs.
- Under the High scenario, the EV proportion of annual sales steadily increases towards the 100% ZEV mandate in 2035 due to additional policy supports including public charging, home charging access, and upfront cost reductions.
- The ZEV mandate will dramatically increase EVs on road out to 2050.





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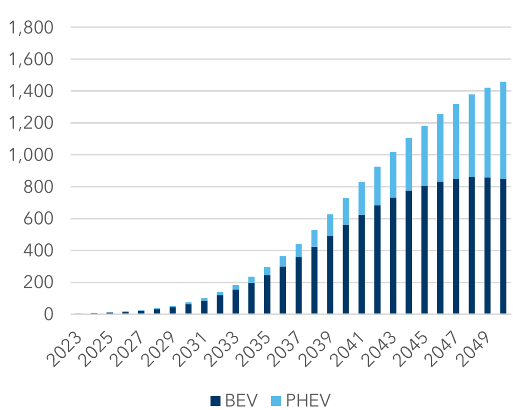
Load Impacts

LDV Load Impacts

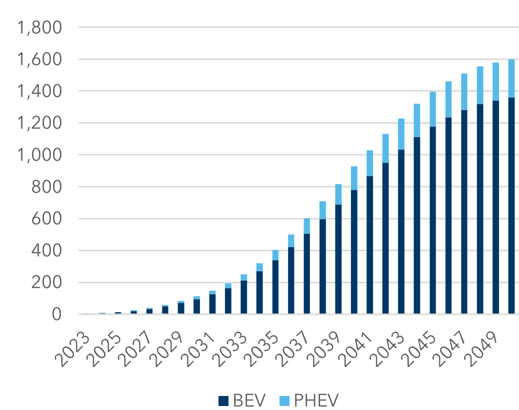
Annual load impacts could range from ~1,460 to 1,800 GWh by 2050 under the Low and High Growth scenarios, respectively, mirroring cumulative EV adoption.

The relative proportion of BEV and PHEVs adopted will also impact annual load growth, as PHEVs drive a proportion of their time on gas, whereas a BEV must always use electricity, resulting in higher energy consumption for BEVs. The breakdown of these two EV types is driven primarily by public charging availability.

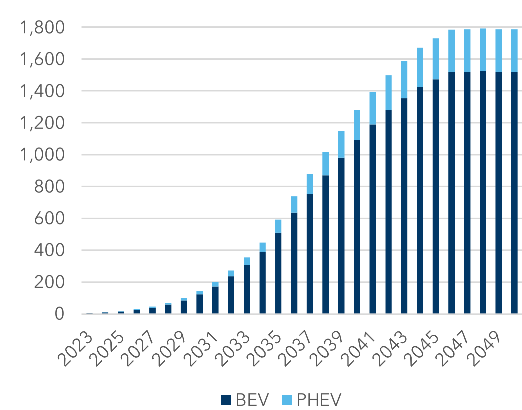
Low Growth (GWh)



Medium Growth (GWh)



High Growth (GWh)



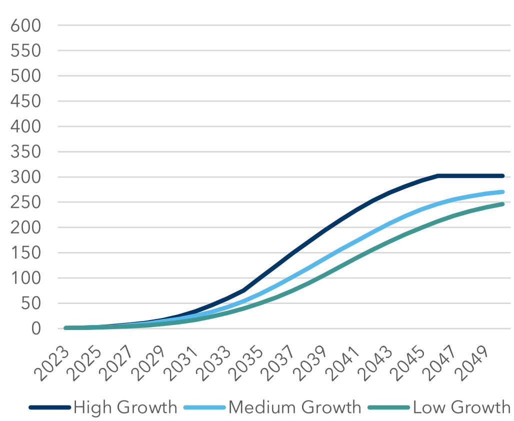
Load Impacts

LDV Load Impacts

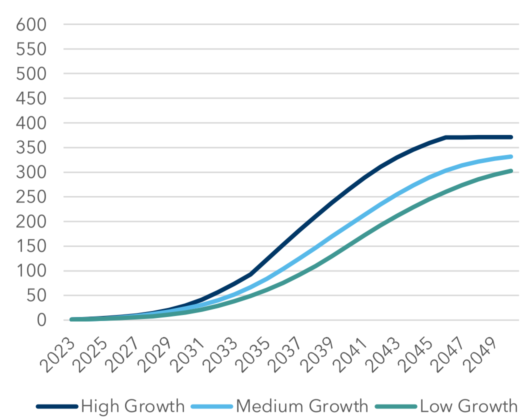
Demand impacts from unmanaged charging load will be significantly higher on a typical peak winter day relative to a peak summer day due to higher EV energy consumption in the colder months.

Outdoor air temperatures on the coldest day can increase energy needs by up to a factor of two relative to summer requirements primarily due to cabin heating requirements.[1]

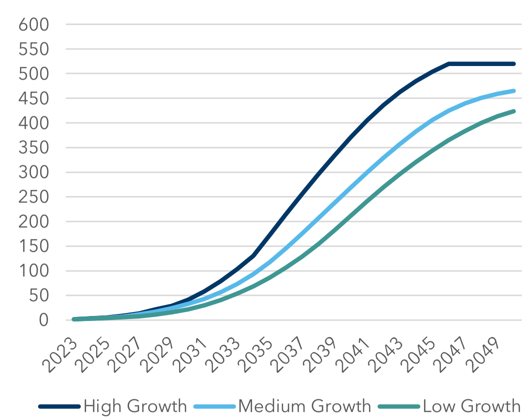
Summer Peak Day (MW)



Shoulder Peak Day (MW)



Winter Peak Day (MW)



[1] Geotab. *To what degree does temperature impact EV range?*

Load Impacts

Key Differences

While forecasted cumulative EVs increased in 2040 compared to the previous study, GWh from EV charging rose at a slower pace relative to cumulative EVs. However, peak demand impacts are similar between the two studies.

These effects are due to:

- A more rigorous 8760 temperature adjustment methodology resulted in a higher average vehicle efficiency
- A higher calculated average vehicle lifetime (12 years instead of 11) , based on emerging market trends

Combined, this results in 1.2 kW of peak demand impact per vehicle instead of 1.7kW in the previous study.

Vehicle	Previous Study kwh/km	Previous Study Vehicle Lifetime	kwh/km	Vehicle Lifetime
Car	0.21	11	0.18	12
SUV	0.26	11	0.225	12
Light-truck	0.29	11	0.25	12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Medium & Heavy-Duty Vehicles

Proposed Scenarios

Scenario Descriptions: Medium and Heavy-Duty Vehicles

The adoption rate of electric vehicles will be assessed under three scenarios that vary policy and program interventions.

Low Growth	**Maintains the status quo.** • Assumes **no new policies and programs** are put in place to support or incentivize electric vehicle adoption
Medium Growth	**Moderate push for MDHV electric vehicle adoption.** • Assumes **some policies/programs** are implemented/maintained that increase the adoption of electric vehicles (additional investment in infrastructure and incentives compared to the low growth scenario)
High Growth	**Strong policy pathway for MDHV to reach Federal ZEV target.**[1] • Assumes more **stringent policies/programs** are put in place to support or incentivize infrastructure and vehicles

1. Emissions Reduction Plan released aligns with 100% of MHDV sales "where feasible" by 2040. Dunsky proposes 100% EV sales for all segments except intercity bus and long-haul trucks.

Proposed Scenarios

Scenarios: Medium and Heavy-Duty Vehicles

Parameter	Scenario 1: **Low Growth**	Scenario 2: **Medium Growth**	Scenario 3: **High Growth**
Policy/Program Interventions			
Vehicle incentives[1]	$75k (Ramped down + phased-out by 2026)	$75k - $200k (Ramped down + phased-out by 2030)	$75k - $200k (Ramped down + phased-out by 2035)
Public procurement targets	None	100% of new transit and school buses by 2032	100% of new transit and school buses by 2027
High power public charging for long-haul heavy-duty vehicles	Up to 350 kW charging (Varies by vehicle segment)	Up to 1 MW charging (Varies by vehicle segment)	Up to 2 MW charging (Varies by vehicle segment)
MHDV ZEV Mandate[2]	No ZEV mandate enforced	No ZEV mandate enforced	ZEV Mandate enforced in 2040

1. Low Growth scenario aligns with July 11th announcement of federal iMHZEV Program and inputs for scenarios 2 and 3 range between $75k - $200k for different vehicle segments.
2. MHDV ZEV mandate of 50% annual sales for long-haul trucking + coach buses, 100% all other segments

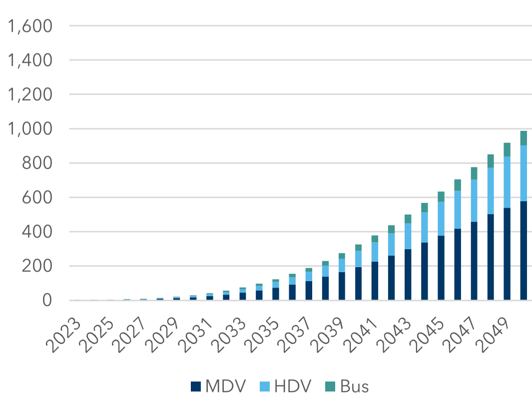
Medium and Heavy-Duty Vehicles

Annual Load Impacts

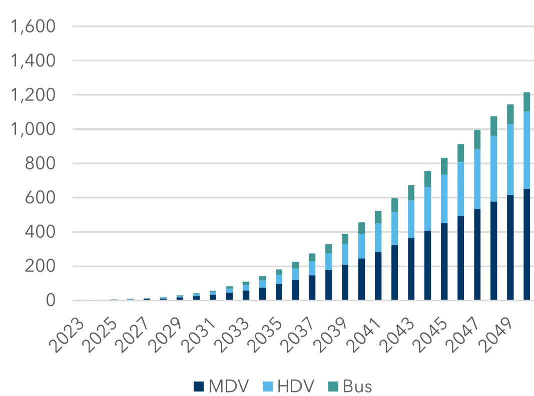
Annual load impacts could range from ~1,000 to over 1,550 GWh by 2050 under the Low and High Growth scenarios, respectively, mirroring cumulative EV adoption.

MDVs represent the largest portion of grid impacts as they are the largest vehicle segment and benefit from a strong business case for electrification resulting in a high market share for EVs.

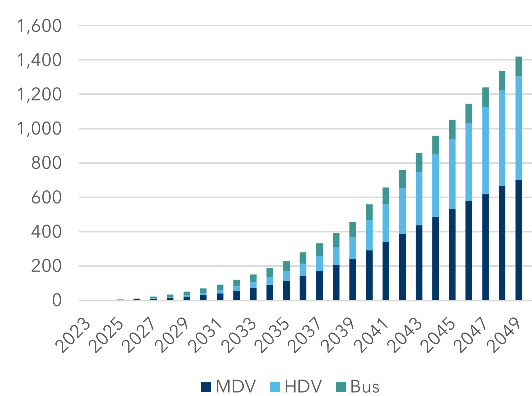
Low Growth (GWh)



Medium Growth (GWh)



High Growth (GWh)



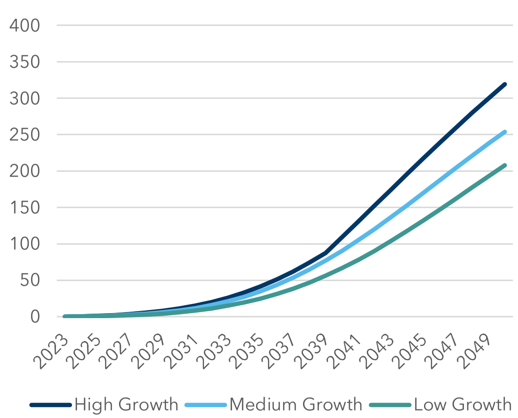
Medium and Heavy-Duty Vehicles

Non-Coincident EV Peak Demand

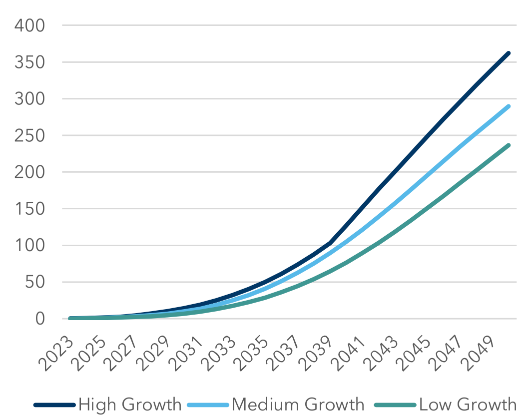
Similar to LDVs, peak impacts for MHDVs are more pronounced in winter compared to summer, which is predominantly driven by cabin heating.

However, truck cabin heating loads do not scale proportionally with overall driving energy demand as a truck cabin is only slightly bigger than an LDV's, so cold temperature impacts are not as pronounced in MDVs and HDVs as they are with LDVs and buses.

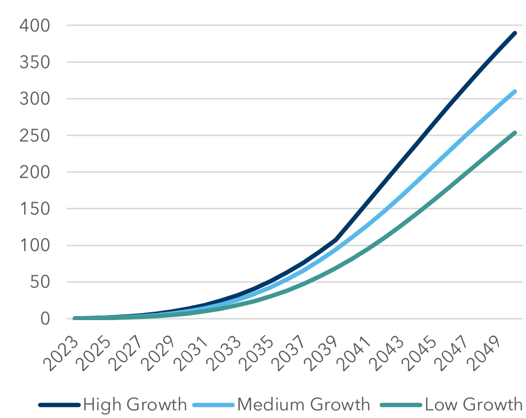
Summer Peak Day (MW)



Shoulder Peak Day (MW)



Winter Peak Day (MW)



[1] Geotab. *To what degree does temperature impact EV range?*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Conclusion

Key Takeaways

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EV adoption is forecasted to increase rapidly over the study period even in a Low EV adoption growth scenario. This would result in winter peak loads of at least 675 MW from EV charging alone, reaching 910 MW in the high adoption scenario. Enforcement of LDV and MHDV ZEV sales mandates at the federal level will make this high scenario much more likely.

Despite representing only 7% of the overall vehicle fleet, MHDVs will have nearly as much peak impact as LDVs due to their high energy needs. As commercial fleets electrify, new and large loads from EV charging may be harder to predict than personal LDVs without proactive engagement with commercial clients.

If managed charging programs and technologies are employed, peak load from EV charging has the potential to be reduced. Actual load shifted will depend on techniques and technologies employed, as well as incentives provided for EV drivers to participate.

Contact

Emma Hill
Principal Analyst
Emma.Hill@dunsky.com
Tel: 514-504-9030 ext. 55

Simone Hacikyan
Consultant
Simone.Hacikyan@dunsky.com
Tel: 514.504.9030 ext. 4272

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Appendix

Appendix

Key Resources

Key Data Source	Use
Natural Resource Canada (NRCan), Comprehensive Energy Use Database (CEUD) **Statistics Canada, Vehicle registrations, by type of vehicle and fuel type**	Province-wide vehicle sales and registrations, segment split (Car, Truck, SUV), EV sales
Community Accounts Unit Newfoundland and Labrador Hydro and Statistics Canada	Total Electric vehicle sales and BEV/PHEV split
Statistics Canada	Population, area of population centers, housing composition, driving distance, fuel prices
Newfoundland and Labrador Hydro	Electricity rates
Natural Resource Canada (NRCan) - Electric Charging and Alternative Fueling Stations Locator	Charging station deployment
Internal Dunsky Database	2022 vehicle cost, vehicle characteristics & projected EV model availability, battery costs

Key Inputs

Vehicle	Previous Study kwh/km	Previous Study vehicle lifetime	Updated kwh/km	Vehicle Lifetime	CEUD Average Annual Driving Distance*
Car	0.21	11	0.18	12	18,200
SUV	0.26	11	0.225	12	18,200
Light-truck	0.29	11	0.225	12	18,200
MDV	0.80	16	0.80	16	26,000
HDV	1.24	20	1.24	20	120,500
Buses	1.20	16	1.20	16	54,000

*weighted averages for MDV and HDV segments reflect the sub segments that are more likely to electrify due to higher drive cycles.

Appendix

Sensitivities

The sensitivity analyses focus on technology and market uncertainty to produce upper and lower bounds for adoption. The low sensitivity is applied to the Low Growth scenario parameters while the high sensitivity is applied to the High Growth scenario parameters to create two sensitivity projections. Changes in local population are accounted for by varying the level of overall vehicle sales between sensitivities.

The results of these scenarios can be reviewed in the dashboard attached to this report.

Parameter	Low Sensitivity (Scenario 1)	Base Case Sensitivity	High Sensitivity (Scenario 3)
Technology Uncertainties			
Battery Costs	Limited cost declines	Moderate cost declines	Aggressive cost declines
EV Model Availability	Limited availability	Moderate availability	High availability
Market Factors			
Electricity Costs	Higher electricity rates	Base case rates	Lower electricity rates
Gasoline & Diesel Costs	≈ 2% per year	≈ 2% per year + $170/ton carbon tax by 2030	≈ 3% per year + $170/ton carbon tax by 2030
Vehicle Sales[1]	No growth in vehicle sales	Increase in vehicle sales to capture population growth	Higher growth than current pace

1. Includes all vehicle segments (ICE, BEV, and PHEV).

Appendix

Differences from previous project

LDV Home Charging Access

Parameter	Scenario 1: Low Growth	Scenario 2: Moderate Growth	Scenario 3: High Growth
Home Charging Access in MURBs (previous)	0.2% (125 stalls) retrofitted per year	• 0.5% stalls retrofitted per year • 5% (in 2021) to 25% (2035) of new construction EV-Ready	• 1% stalls retrofitted per year • EV-Ready building codes starting 2026 (i.e. 100% of new construction)
Home Charging Access in MURBs (new)	Limited *15% of multi-unit buildings with access to charging by 2035*	Moderate *40% of multi-unit buildings with access to charging by 2035*	Significant *90% of multi-unit buildings with access to charging by 2035*

MHDV incentives

Parameter	Scenario 1: Low Growth	Scenario 2: Moderate Growth	Scenario 3: High Growth
MHDV Incentives (previous)	None	25% of incremental cost, up to $75k *(Ramped down and phased-out by 2026)*	50% of incremental cost, up to $150k *(Ramped down and phased-out by 2030)*
MHDV Incentives (new)	$75k (Ramped down + phased-out by 2026)	$75k - $200k (Ramped down + phased-out by 2030)	$75k - $200k (Ramped down + phased-out by 2035)

Vehicle Sales

Parameter	Low Sensitivity (Scenario 1)	Base Case Sensitivity	High Sensitivity (Scenario 3)
Vehicle Sales (previous)	Declining vehicle sales	No growth in vehicle sales	Increase in vehicle sales at current pace
Vehicle Sales (new)	No growth in vehicle sales	Increase in vehicle sales at current pace	Higher growth than current pace

* Additionally no LDV or MHDV ZEV mandates applied in previous model. Now ZEV mandates enforced in the high scenario.

Appendix

LDV: Key Inputs and Sensitivities

Battery Costs ($/kWh)[1]

	2022	2025	2030	2035	2040	2045	2050
Low	$275	$160	$80	$62	$48	$48	$48
Mid	$275	$217	$147	$99	$75	$75	$75
High	$275	$270	$209	$161	$121	$121	$121

Average Electricity Prices ($/kWh)[2]

	2022	2025	2030	2035	2040	2050
Low	$0.163	$0.168	$0.176	$0.185	$0.195	$0.205
Mid	$0.163	$0.173	$0.191	$0.211	$0.233	$0.257
High	$0.163	$0.178	$0.206	$0.239	$0.277	$0.322

Other inputs

	Value (2022)
Province Population	526,000
Population in centres with >1,000 people	385,000
Number of Population centres with >1,000 people	63
Estimated Land area of Population centres (sq. km)	4,000
Highway length (km)[3]	2,500

1. Bloomberg New Energy Finance “EV Outlook 2020” and U.S. Energy Information Administration “Annual Energy Outlook 2020”. Population center inputs of the province are needed to determine the charging infrastructure needs to reach geographic coverage in the province.
2. Average electricity prices were calculated based historic delivered cost.
3. The value represents an estimate of the length of highways within the province that need to be covered by charging infrastructure deployment based on data on length of key highways, freeways, expressways and principal arterial roads.

Appendix

LDV: Key Inputs and Sensitivities

Cumulative and Annual Vehicle Stock (Fleet) and Vehicle Sales (Rounded to Nearest 10)
(Included both passenger and commercial LDVs, with commercial fleets assumed to make up 10% of sales)

			2022	2025	2030	2035	2040	2045	2050
Low Sensitivity	Cars	Total Fleet	119,300	105,100	82,600	78,400	78,400	78,400	78,400
		New Sales	5,400	6,500	6,500	6,500	6,500	6,500	6,500
	SUVs	Total Fleet	146,900	167,800	203,500	210,500	210,500	210,500	210,500
		New Sales	14,600	17,500	17,500	17,500	17,500	17,500	17,500
	Light-Trucks	Total Fleet	120,200	113,600	100,300	97,500	97,500	97,500	97,500
		New Sales	6,800	8,100	8,100	8,100	8,100	8,100	8,100
Base Case	Cars	Total Fleet	119,300	108,500	87,000	83,600	83,800	83,900	84,000
		New Sales	5,400	6,700	6,900	7,000	7,000	7,000	7,000
	SUVs	Total Fleet	146,900	173,200	214,300	224,300	225,100	225,200	225,600
		New Sales	14,600	18,100	18,500	18,700	18,800	18,800	18,800
	Light-Trucks	Total Fleet	120,200	117,300	105,700	103,900	104,200	104,200	104,400
		New Sales	6,800	8,400	8,600	8,700	8,700	8,700	8,700
High Sensitivity	Cars	Total Fleet	119,300	111,900	91,500	88,700	89,200	89,300	89,600
		New Sales	5,400	7,000	7,200	7,400	7,400	7,400	7,500
	SUVs	Total Fleet	146,900	178,700	225,200	238,100	239,600	239,800	240,600
		New Sales	14,600	18,700	19,400	19,800	20,000	20,000	20,100
	Light-Trucks	Total Fleet	120,200	120,900	111,000	110,200	110,900	111,000	111,400
		New Sales	6,800	8,600	9,000	9,200	9,200	9,300	9,300

			2022	2025	2030	2035	2040	2045	2050
LDV Totals	Low Sensitivity	Total Fleet	386,400	386,400	386,400	386,400	386,400	386,400	386,400
		New Sales	26,800	32,200	32,200	32,200	32,200	32,200	32,200
	Base Case	Total Fleet	386,400	399,000	407,100	411,800	413,100	413,300	414,000
		New Sales	26,800	33,200	33,900	34,300	34,400	34,400	34,500
	High Sensitivity	Total Fleet	386,400	411,500	427,700	437,100	439,800	440,100	441,600
		New Sales	26,800	34,300	35,600	36,400	36,600	36,700	36,800

Source: CEUD vehicle explanatory variable tables for cars and light trucks. https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=CP&sector=tran&juris=nl&year=2020&rn=21&page=0

Appendix

MHDV: Key Inputs and Sensitivities

Battery Costs ($/kWh)[1]

	2022	2025	2030	2035	2040	2045	2050
Low	$275	$160	$80	$62	$48	$48	$48
Mid	$275	$217	$147	$99	$75	$75	$75
High	$275	$270	$209	$161	$121	$121	$121

Average Electricity Prices ($/kWh)[2]

	2022	2025	2030	2035	2040	2050
Low	$0.14	$0.14	$0.15	$0.16	$0.17	$0.17
Mid	$0.14	$0.15	$0.16	$0.18	$0.20	$0.22
High	$0.14	$0.15	$0.18	$0.20	$0.24	$0.27

1. Bloomberg New Energy Finance “EV Outlook 2020” and U.S. Energy Information Administration “Annual Energy Outlook 2022”.
2. Average electricity prices were calculated based on historic delivered cost.

Appendix

MHDV: Key Inputs and Sensitivities

MDV Cumulative and Annual Vehicle Stock (Fleet) and Vehicle Sales (Rounded to Nearest 10)

		2022	2025	2030	2035	2040	2045	2050
Low Sensitivity	Urban Delivery (Fleet)	15,840	16,640	18,340	20,210	20,610	20,610	20,610
	Urban Delivery (Sales)	1,290	1,290	1,290	1,290	1,290	1,290	1,290
	Service Vehicles (Fleet)	5,230	5,550	6,110	6,740	6,870	6,870	6,870
	Service Vehicles (Sales)	430	430	430	430	430	430	430
Base Case	Urban Delivery (Fleet)	15,840	17,040	19,230	21,700	23,130	24,310	25,550
	Urban Delivery (Sales)	1,300	1,340	1,410	1,480	1,560	1,640	1,720
	Service Vehicles (Fleet)	5,280	5,680	6,410	7,230	7,710	8,100	8,520
	Service Vehicles (Sales)	430	450	470	490	520	550	570
High Sensitivity	Urban Delivery (Fleet)	15,840	17,450	20,180	23,320	25,990	28,700	31,680
	Urban Delivery (Sales)	1,300	1,390	1,540	1,700	1,880	2,070	2,290
	Service Vehicles (Fleet)	5,280	5,820	6,730	7,770	8,660	9,570	10,560
	Service Vehicles (Sales)	430	460	510	570	630	690	760

Source: CEUD vehicle explanatory variable tables for trucks. https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=CP&sector=tran&juris=nl&year=2020&rn=37&page=0

Appendix

MHDV: Key Inputs and Sensitivities

HDV Cumulative and Annual Vehicle Stock (Fleet) and Vehicle Sales (Rounded to Nearest 10)

		2022	2025	2030	2035	2040	2045	2050
Low Sensitivity	Short Haul (Fleet)	1,460	1,430	1,420	1,410	1,400	1,400	1,400
	Short Haul (Sales)	70	70	70	70	70	70	70
	Long-Haul (Fleet)	1,640	1,630	1,620	1,610	1,590	1,590	1,590
	Long-Haul (Sales)	80	80	80	80	80	80	80
	Other HDV (Fleet)	1,840	1,830	1,820	1,800	1,790	1,790	1,790
	Other HDV (Sales)	90	90	90	90	90	90	90
Base Case	Short Haul (Fleet)	1,460	1,470	1,490	1,520	1,540	1,620	1,700
	Short Haul (Sales)	70	70	80	80	80	90	90
	Long-Haul (Fleet)	1,660	1,670	1,700	1,730	1,750	1,840	1,940
	Long-Haul (Sales)	80	80	90	90	100	100	110
	Other HDV (Fleet)	1,860	1,880	1,900	1,940	1,970	2,070	2,170
	Other HDV (Sales)	90	90	100	100	110	110	120
High Sensitivity	Short Haul (Fleet)	1,460	1,510	1,570	1,630	1,700	1,880	2,070
	Short Haul (Sales)	70	80	80	90	100	110	120
	Long-Haul (Fleet)	1,660	1,710	1,780	1,860	1,930	2,140	2,360
	Long-Haul (Sales)	80	90	100	110	120	130	140
	Other HDV (Fleet)	1,860	1,920	2,000	2,080	2,170	2,390	2,640
	Other HDV (Sales)	90	100	110	120	130	140	160

Source: CEUD vehicle explanatory variable tables for trucks. https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=CP&sector=tran&juris=nl&year=2020&rn=37&page=0

Appendix

MHDV: Key Inputs and Sensitivities

Bus Cumulative and Annual Vehicle Stock (Fleet) and Vehicle Sales (Rounded to Nearest 10)
(Included both passenger and commercial LDVs, with commercial fleets assumed to make up 10% of sales)

		2022	2025	2030	2035	2040	2045	2050
Low Sensitivity	Transit (Fleet)	460	460	440	430	430	430	430
	Transit (Sales)	30	30	30	30	30	30	30
	School (Fleet)	820	810	800	780	780	780	780
	School (Sales)	50	50	50	50	50	50	50
	Coach (Fleet)	90	90	110	120	130	130	130
	Coach (Sales)	10	10	10	10	10	10	10
Base Case	Transit (Fleet)	470	470	460	460	480	510	530
	Transit (Sales)	30	30	30	30	30	30	40
	School (Fleet)	830	830	840	840	870	920	970
	School (Sales)	50	50	50	60	60	60	60
	Coach (Fleet)	90	100	110	130	140	150	160
	Coach (Sales)	10	10	10	10	10	10	10
High Sensitivity	Transit (Fleet)	470	480	490	500	540	600	660
	Transit (Sales)	30	30	30	40	40	40	50
	School (Fleet)	840	850	880	900	980	1,080	1,200
	School (Sales)	50	50	60	60	70	80	90
	Coach (Fleet)	90	100	120	140	160	180	190
	Coach (Sales)	10	10	10	10	10	10	10

Source: CEUD vehicle explanatory variable tables for buses. https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=CP&sector=tran&juris=nl&year=2020&rn=31&page=0

Appendix A: Key Inputs and Assumptions

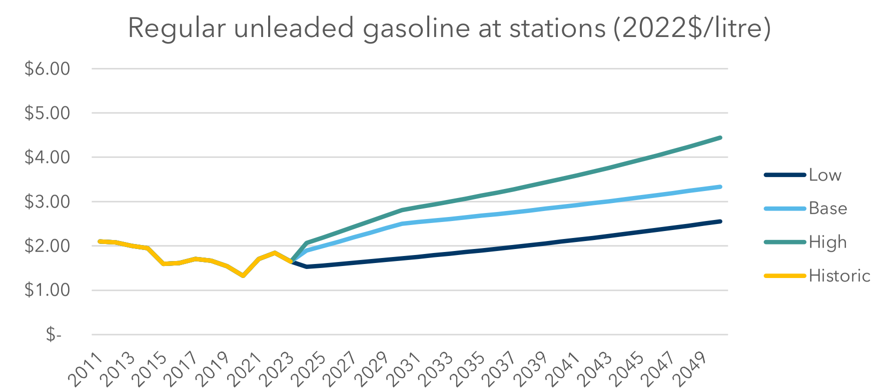
Gasoline and Diesel Rates

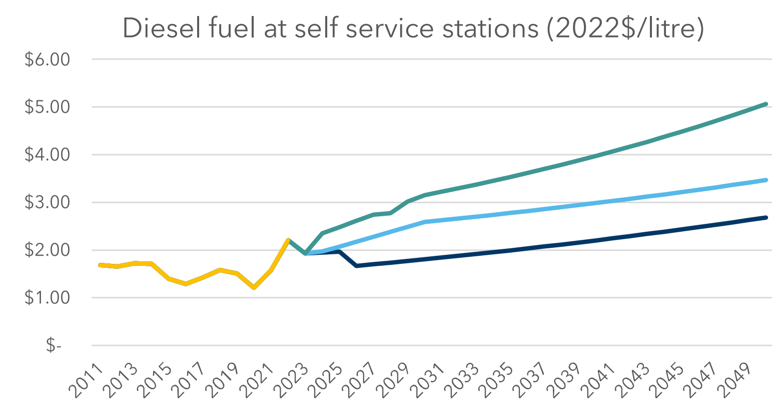
Historical retail gasoline and diesel rates have been volatile with rapid increases in the past.

The three rate scenarios attempt to capture the wide uncertainty in future prices.

Component	Lower Bound Sensitivity	Base Case	Upper Bound Sensitivity
Fuel Cost[1]	2024 price reverts to 5-year average; 2% real increase thereafter	2024 price reverts to 5-year average; 2% real increase thereafter	2024 price reverts to 2-year average; 3% real increase thereafter
Carbon tax	NA	Increases to and remains at $170 (nominal) in 2030.	Increases to and remains at $170 (nominal) in 2030.

[1] Historic St. John's rates from Statistics Canada Monthly average retail prices for gasoline and fuel oil





Appendix

Approach: Forecasted EV Adoption Overview

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The EVA model was applied to forecast EV adoption using the following approach:

1. **Market Characterization:** Divide the market into vehicle segments (as depicted earlier), develop representative characteristics for each segment and collect data on annual vehicle sales, fleet size and other key market inputs.

2. **Model Calibration:** Using historical inputs on vehicle sales, energy prices, vehicle costs, incentive programs and infrastructure deployment to benchmark the model to historical adoption and calibrate key model parameters to local market conditions.

3. **Scenario Analysis:** Forecast service territory-wide EV adoption under scenarios reflecting different program/policy interventions (e.g. infrastructure deployment, incentives) as well as market and technology conditions (e.g. battery costs, energy prices).

Appendix

Approach: Passenger Vehicles versus Commercial Fleets

Consideration and treatment of key barriers in the model for personal vehicles and commercial fleets reflects key differences in decision-making between the segments.

Barrier	Personal LDV	Commercial LDV	Commercial MHDV
Technical	Base vehicle assumed to be **gasoline ICEV**		Base vehicle assumed to be **diesel ICEV**
Economic	**Upfront cost and Total Cost of Ownership (TCO)**	Based **on Internal Rate of Return (IRR)** of the vehicle's upfront and operational costs over its lifetime.	
Constraints	• Range Anxiety • Charging Time • Public Charging Coverage • **Public Charging Availability** • **Home Charging Access**	• Range Requirement • Charging Time Requirement • Public Charging Coverage	• Range Requirement • Charging Time Requirement
Market	**Competition** between PHEV and BEVs		**No competition** between PHEVs and BEVs (i.e. all assumed to be BEVs)

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