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NEWFOUNDLAND POWER
A FORTIS COMPANY

June 2, 2023

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

Attention: G. Cheryl Blundon
Director of Corporate Services
and Board Secretary

Dear Ms. Blundon:

Re: Application for EV Load Management Pilot Project

Please find enclosed an application by Newfoundland Power Inc. ("Newfoundland Power" or the "Company") proposing the recovery of costs through its Electrification Cost Deferral Account to complete an Electric Vehicle ("EV") Load Management Pilot Project (the "Application").

In Order No. P.U. 33 (2022), the Board invited Newfoundland Power, along with Newfoundland and Labrador Hydro to file applications for the approval to recover the cost of specific electrification initiatives which are shown to be appropriate for this province at this time. The Application submits that it is appropriate to proceed with a pilot project at this time to assess the cost-effectiveness of strategies to manage EV load.

If you have any questions regarding the enclosed, please contact the undersigned.

Yours truly,

Lindsay Hollett

Lindsay Hollett
Senior Legal Counsel and Assistant Corporate Secretary

ec. Shirley Walsh
Newfoundland and Labrador Hydro

Dennis M. Browne, K.C.
Browne Fitzgerald Morgan & Avis

Newfoundland Power Inc.
55 Kenmount Road • P.O. Box 8910 • St. John's, NL A1B 3P6
PHONE (709) 737-5364 • **FAX** (709) 737-2974 • **lhollett@newfoundlandpower.com**

IN THE MATTER OF the *Public Utilities Act* (the "Act"); and

IN THE MATTER OF an Application by Newfoundland Power Inc. for the approval to recover via its Electrification Cost Deferral Account costs to complete a pilot project to assess load management strategies for electric vehicles ("EV") pursuant to section 80 of the Act.

TO: The Board of Commissioners of Public Utilities (the "Board")

THE APPLICATION OF Newfoundland Power Inc. (the "Applicant") **SAYS THAT:**

A. Background

1. The Applicant is a corporation duly organized and existing under the laws of the Province of Newfoundland and Labrador, is a public utility within the meaning of the Act, and is subject to the provisions of the *Electrical Power Control Act, 1994*.

2. The Applicant has a lengthy history of delivering conservation and demand management ("CDM") programs to its customers. The Applicant filed a multi-year plan to continue longstanding customer CDM programs and introduce electrification initiatives for customers in December 2020.

3. In Order No. P.U. 33 (2022), the Board confirmed that it continues to believe appropriate electrification initiatives, combined with measures to reduce peak load, are likely to lead to positive outcomes for customers in the long term. The Board invited the the Applicant, along with Newfoundland and Labrador Hydro, to file subsequent applications for the approval to recover the cost of specific electrification initiatives which are shown to be appropriate for this province at this time.

4. Order No. P.U. 3 (2022) approved an Electrification Cost Deferral Account for the Applicant to provide for the deferred recovery of costs related to electrification initiatives.

B. EV Load Management

5. The latest independent forecasts of EV adoption in Newfoundland and Labrador show the uptake in light-duty EVs is expected to be considerable over the long term. Increased light-duty EV adoption is expected to have a significant impact on peak demand, resulting in a need for additional system capacity and higher system costs which would be borne by the Applicant's customers.

6. Managing the peak demand impacts of light-duty EV adoption will require implementing measures to avoid increasing system capacity by shifting EV charging to periods when spare capacity is available. This would mitigate increasing system costs and support the

delivery of reliable service to the Applicant's customers at the lowest possible cost, as required by the provincial power policy contained in the *Electrical Power Control Act, 1994*.

7. It is sound public utility practice in Canada to implement pilot projects to explore the optimal measures for managing EV load in a jurisdiction. Utilities across Canada have implemented pilot projects to explore load management strategies for light-duty EVs. This approach is appropriate in Newfoundland and Labrador.

C. Proposed Pilot Project

8. The Applicant has designed a pilot project to assess the cost-effectiveness of strategies to manage light-duty EV load in this jurisdiction that is consistent with sound public utility practice. The EV Load Management Pilot Project will collect information on local EV owners' charging behaviours, the effectiveness of various strategies in shifting load to off-peak periods, and the costs and challenges of implementing these strategies. This information is needed to inform the development of cost-effective customer programs to manage EV load in this jurisdiction prior to the widespread adoption of EVs.

9. The EV Load Management Pilot Project is proposed to take place from the third quarter of 2023 to the second quarter of 2025. The total budget estimate for the EV Load Management Pilot Project is $1,504,000. It is proposed that actual costs incurred to complete the EV Load Management Pilot Project be recovered through the Applicant's Electrification Cost Deferral Account.

10. Schedule "A" to this Application provides a report establishing the context for the Application, including the latest forecasts of EV adoption and system impacts in Newfoundland and Labrador and a review of current Canadian utility practice. Schedule "A" also provides the detailed scope of work, timelines and budget estimate for the EV Load Management Pilot Project.

11. The Applicant submits that the proposed pilot project, referred to in paragraphs 8 through 10 hereof, is consistent with sound public utility practice and the delivery of reliable service to the Applicant's customers at the lowest possible cost. The Applicant further submits that the costs to complete the pilot project are reasonable and prudent in providing service to customers and should be recovered through the Electrification Cost Deferral Account.

12. Communications with respect to this Application should be sent to Lindsay Hollett, Senior Legal Counsel and Assistant Corporate Secretary for the Applicant.

D. Order Requested

13. The Applicant requests that the Board approve, pursuant to section 80 of the Act, recovery via its Electrification Cost Deferral Account of costs to complete a pilot project for EV load management, as set out in this Application.

DATED at St. John's, Newfoundland, this 2nd day of June, 2023.

NEWFOUNDLAND POWER INC.

Lindsay Hollett
Senior Legal Counsel and Assistant Corporate Secretary
Newfoundland Power Inc.
P.O. Box 8910
55 Kenmount Road
St. John's, Newfoundland A1B 3P6

Telephone: (709) 737-5364
Telecopier: (709) 737-2974

IN THE MATTER OF the *Public Utilities Act* (the "Act"); and

IN THE MATTER OF an Application by Newfoundland Power Inc. for the approval to recover via its Electrification Cost Deferral Account costs to complete a pilot project to assess load management strategies for electric vehicles ("EV") pursuant to section 80 of the Act.

AFFIDAVIT

I, Byron Chubbs, of the Town of Paradise, in the Province of Newfoundland and Labrador, Professional Engineer, make oath and say as follows:

1. THAT I am Vice President, Engineering and Energy Supply of Newfoundland Power Inc.;

2. THAT I have read and understand the foregoing Application; and

3. THAT, to the best of my knowledge, information and belief, all matters, facts and things set out in this Application are true.

SWORN TO before me at the City of St. John's in the Province of Newfoundland and Labrador this 2nd day of June, 2023:

Barrister, NL

Byron Chubbs, P.Eng

EV Load Management Pilot Project

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Table of Contents

1.0 Executive Summary

Electric Vehicle ("EV") adoption is forecast to increase in Newfoundland and Labrador, with 100,000 to 200,000 light-duty EVs on the province's roads by 2040. The unmanaged charging of EVs would have a significant impact on peak demand on the electrical system, creating a need for additional system capacity. This would result in higher costs borne by electricity customers.

It is established sound public utility practice to manage light-duty EV load by implementing measures to shift EV charging to off-peak periods when spare capacity is available on the electrical system. Electric utilities across Canada have launched pilot projects to collect the information necessary to determine optimal measures for managing light-duty EV load and system costs in their jurisdictions.

Newfoundland Power Inc. ("Newfoundland Power" or the "Company") has designed a pilot project to assess the cost-effectiveness of strategies to manage light-duty EV load on the Island Interconnected System. The EV Load Management Pilot Project aims to understand EV charging behaviours in the province and the effectiveness, costs and challenges of different strategies to shift EV load to off peak periods. This approach is consistent with the pilot projects implemented by other Canadian electric utilities and was developed in consultation with Newfoundland and Labrador Hydro ("Hydro"). Hydro has provided a letter of support for the pilot project.

It is appropriate to conduct the EV Load Management Pilot Project in the province at this time as it will enable the utilities to identify cost-effective measures to manage EV load prior to their widespread adoption. The results of the pilot project will inform the next suite of customer demand management programs anticipated to be launched by the utilities in 2026.

The pilot project is scheduled to run from 2023 to 2025 with a budget estimate of $1,504,000. Newfoundland Power proposes to recover actual costs incurred to complete the EV Load Management Pilot Project through its Electrification Cost Deferral Account, as approved by the Board in Order No. P.U. 3 (2022).

2.0 Background

Newfoundland Power has a lengthy history of delivering conservation and demand management ("CDM") programs to its customers. CDM programs generally include incentives to encourage the adoption of energy-efficient technologies, customer education initiatives, and pilot projects to investigate cost-effective solutions to save energy and manage peak demand.[1]

In 2020, the Company filed with the Board of Commissioners of Public Utilities of Newfoundland and Labrador (the "Board") a comprehensive plan to continue longstanding customer CDM programs and introduce electrification programs (the "2021 Plan").[2] The 2021 Plan was developed in coordination with Hydro following the *Reference on Rate Mitigation Options and Impacts,* during which the Board found that *"maximizing domestic load through electrification, improving energy efficiency and using demand response to reduce peak and allow for increased export sales leads to the best outcomes for customers."*[3]

The electrification initiatives outlined in the 2021 Plan included investments in publicly available EV charging infrastructure, incentive programs for customers, and a pilot project to investigate options for managing EV load. To date, the Board has approved approximately $1.5 million in capital investments for Newfoundland Power to construct an EV Charging Network, along with additional investments by Hydro.[4] The Board also approved an Electrification Cost Deferral Account for Newfoundland Power to provide for the recovery of costs related to electrification initiatives, including major studies and pilot programs in accordance with Board orders.[5]

The Board confirmed in Order No. P.U. 33 (2022) that it continues to believe appropriate electrification initiatives, combined with measures to reduce peak load, are likely to lead to

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1 Costs associated with the delivery of CDM programs are recovered through the CDM Cost Deferral Account approved by the Board in Order No. P.U. 13 (2013).

2 See Volume 2 of Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application* filed with the Board on December 16, 2020.

3 See the Board's *Reference to the Board: Rate Mitigation Options and Impacts, Muskrat Falls Project – Final Report*, February 7, 2020, page iii.

4 See Order No. P.U. 30 (2021).

5 See Order No. P.U. 3 (2022).

positive outcomes for customers in the long term.[6] The Board invited the utilities to file subsequent applications *"for approval to recover the cost of specific electrification initiatives which are shown to be appropriate for this Province at this time."*[7] In the case of load management initiatives, the Board noted the utilities may present evidence as to the criticality of the proposed measures. For customer research and pilot projects, the Board noted the utilities may present evidence as to the need for the information to be gathered.[8]

Following a review of the Board's findings and consultations with Hydro, Newfoundland Power identified the need to prioritize a pilot project to determine the most cost-effective solutions to manage the peak demand impacts of EV charging. The priority of this initiative reflects the increasing system costs that would occur if EV charging and associated impacts on peak demand are left unmanaged. While EV adoption has been low in the province to date, it is forecast to increase over time due to government net zero initiatives and market factors such as cost parity of EVs with gasoline-powered vehicles. It is appropriate to conduct a pilot project in the province at this time to assess optimal solutions for managing the peak demand and system cost impacts of EVs prior to their widespread adoption.

Section 3.0 of this report provides an overview of the latest forecasts of EV adoption and system impacts, as well as a review of current Canadian utility practice regarding EV load management. This information demonstrates that proceeding with a pilot project to assess options for EV load management is consistent with sound public utility practice and the continued provision of least-cost, reliable service to customers.

Section 4.0 of this report details the Company's proposal for an EV Load Management Pilot Project. The pilot project will provide the information necessary to determine the optimal measures for managing EV load in Newfoundland and Labrador prior to the widespread adoption of EVs in the coming years.

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6 See Order No. P.U. 33 (2022), page 11, lines 17 to 19.
7 See Order No. P.U. 33 (2022), page 16, lines 1 to 3.
8 See Order No. P.U. 33 (2022).

Newfoundland Power proposes to recover actual costs incurred to execute the EV Load Management Pilot Project through its Electrification Cost Deferral Account. Attachment A provides the definition of the Electrification Cost Deferral Account as approved by the Board.[9]

3.0 EV Adoption and Impacts

3.1 General

EV adoption in Newfoundland and Labrador continues to lag behind other provinces.[10] At the end of the first quarter of 2023, EVs accounted for only 787 of the 383,000 vehicles on the province's roads. The vast majority of EVs registered in the province are light-duty vehicles.[11]

EV adoption is expected to increase throughout Canada in the coming years as the Federal Government takes steps to electrify the country's transportation sector to reduce greenhouse gas emissions. Federal targets have been established to achieve 100% zero-emission vehicle sales by 2035, with incremental targets of 20% and 60% of annual vehicle sales by 2026 and 2030, respectively.[12] Federal investments in EV charging stations, vehicle incentive programs and EV manufacturing aim to address barriers to purchasing EVs in Canada. While it is uncertain whether federal targets will be achieved in Newfoundland and Labrador, EV adoption is expected to increase over time.

The next section provides the latest forecast of EV adoption and system impacts in Newfoundland and Labrador based on an independent study conducted by Dunsky Energy

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9 The Electrification Cost Deferral Account provides for the recovery of various costs related to electrification initiatives, including the costs of major studies such as pilot programs, comprehensive customer surveys and potential studies that cost greater than $100,000. The proposed pilot project fits within this definition.

10 For example, EVs accounted for 1.6% of annual vehicle sales in Newfoundland and Labrador in 2022, compared to 13.6% in British Columbia, 9.1% in Québec and 5.5% in Ontario.

11 See Newfoundland and Labrador Statistics Agency, *Hydro & Electric Vehicles Newfoundland and Labrador Q1 2023,* accessed May 2023.

12 See Government of Canada news release *Minister of Transport advances Canada's efforts to fight climate change at COP26,* April 24, 2023.

Consulting ("Dunsky") in 2022 as part of Hydro's *Reliability and Resource Adequacy Study*.[13] A review of EV load management strategies and current Canadian utility practice is then provided.

3.2 Latest EV Forecasts

Dunsky modelled three scenarios to forecast EV adoption in Newfoundland and Labrador, including the associated energy and peak demand impacts of each scenario. These scenarios are: (i) Low Growth, which reflects limited government investments in vehicle incentives and charging infrastructure; (ii) Moderate Growth, which reflects continued government intervention in line with existing programs; and (iii) High Growth, which reflects significant investment over the next 12 years.

Table 1 summarizes Dunsky's EV adoption scenarios.

Table 1
Dunsky EV Adoption Scenarios

Interventions	Scenario 1: Low	Scenario 2: Moderate	Scenario 3: High
Vehicle Incentives	Federal and provincial incentives until 2025	Federal and provincial incentives until 2030	Federal and provincial incentives until 2035
Public Charging (by 2040)	Limited expansion (65 DCFC sites; 100 Level 2 sites)	Expansion in line with historical trends (100 DCFC sites; 340 Level 2 sites)	Significant investment (360 DCFC sites; 400 Level 2 sites)
Charging in Multi-Unit Residential Buildings	0.2% retrofitted per year	0.5% retrofitted per year; 5%-25% of new construction EV ready	1% retrofitted per year; 100% of new construction EV ready

Dunsky noted that, while there is uncertainty regarding which scenario will materialize, investment and supports from the Federal Government are expected to continue as it aims to achieve its net zero targets.[14]

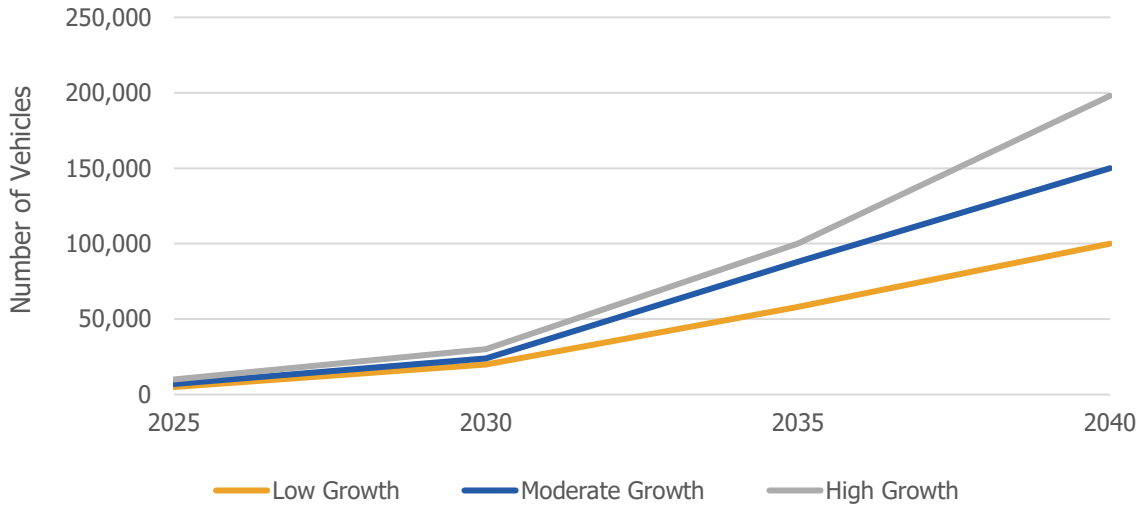
[13] Dunsky's study is provided as Attachment 2 of Volume III of Hydro's *Reliability and Resource Adequacy Study – 2022 Update* filed with the Board on October 3, 2022 (the *"RRAS 2022 Update")*.

[14] See the *RRAS 2022 Update – Volume III, Attachment 2*, page 21.

Dunsky separately modelled EV adoption for light, medium and heavy-duty vehicles and buses. This report summarizes Dunsky's findings for light-duty vehicles only, as this vehicle segment represents the best opportunity for load management over the near term.[15] Dunsky's forecast of light-duty EV adoption includes both plug-in hybrid and battery electric vehicles.[16]

Figure 1 shows forecasted light-duty EV adoption in Newfoundland and Labrador from 2025 to 2040.

Figure 1
Forecast Light-Duty EV Adoption
(2025-2040)



The overall scale of EV adoption in Newfoundland and Labrador is variable under the modelled scenarios, but is expected to be significant over time. When considering all scenarios, the number of light-duty EVs registered in the province is expected to range from 5,000 to 10,000 by 2025, increasing to 100,000 to 200,000 EVs by 2040.[17] Under the Low Growth scenario, EV

[15] Light-duty vehicles include passenger cars, SUVs and trucks. Dunsky noted that, currently, only light-duty vehicles are typically considered for managed charging programs due to their lower drive cycles and longer overnight charging periods. See the *RRAS 2022 Update – Volume III, Attachment 2*, page 18.

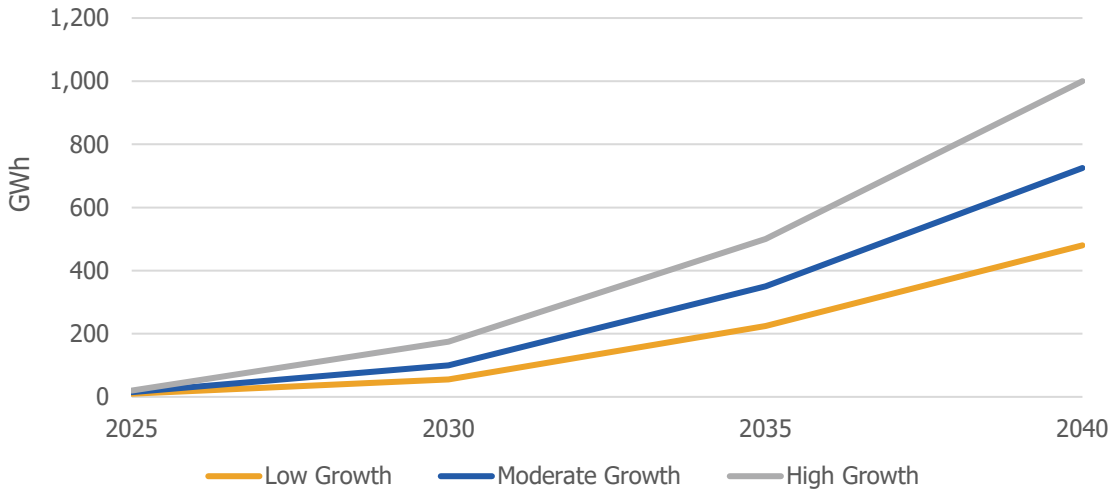
[16] Plug-in hybrid vehicles combine a gasoline or diesel engine with an electric motor and rechargeable battery. Modern plug-in hybrid vehicles can be driven in electric mode over varying distances before the combustion engine is required. Battery electric vehicles have an engine that is propelled by electricity from one or more high capacity batteries.

[17] The battery cost forecast is most conservative in early years due to uncertainty around the timing of achieving economies of scale for battery production and trends towards a more optimistic battery cost forecast in the 2030s when the market is expected to be well established. See the *RRAS 2022 Update – Volume III, Attachment 2*, page 27.

adoption is expected to fall substantially short of federal targets with the market dominated by plug-in hybrids due to a lack of public charging infrastructure.[18] The more significant investments modelled under the High Growth scenario would put the province on a trajectory to meet federal targets with a much higher penetration of battery electric light-duty vehicles. [19]

Figure 2 shows forecasted energy impacts of light-duty EV adoption in Newfoundland and Labrador from 2025 to 2040.

Figure 2
Forecast Energy Impacts of Light-Duty EV Adoption
(2025-2040)



Light-duty EV adoption is forecast to have a significant impact on electricity consumption in the province, accounting for 480 GWh to 1,000 GWh of annual energy sales by 2040 based on the modelled scenarios. Increased energy sales have the potential to deliver benefits for electricity customers in the province, but also require managing a corresponding increase in peak demand on the electrical system.

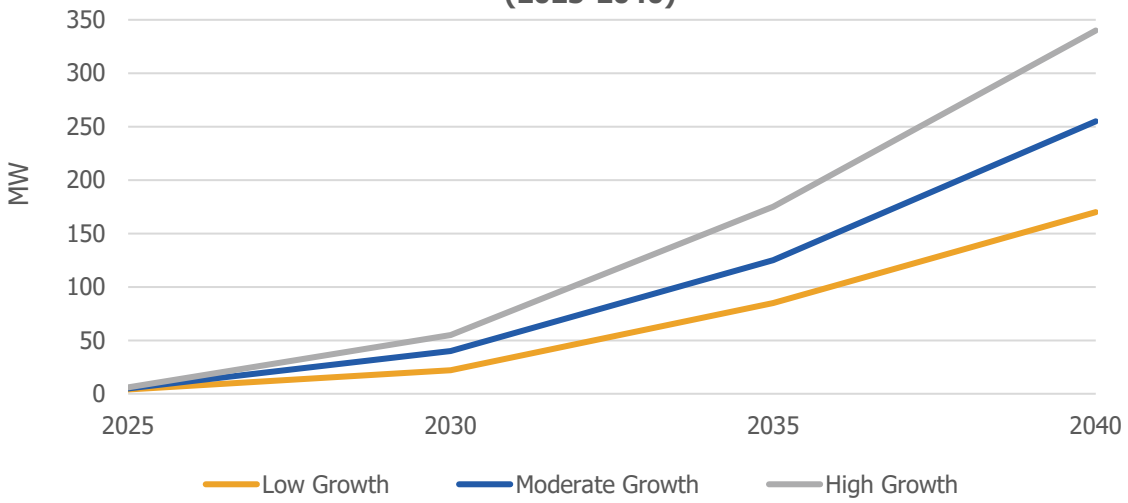
The Island Interconnected System experiences two peak periods per day during the winter season: a morning peak between 7:00 am and 11:00 am, and an evening peak between 4:00 pm and 10:00 pm. It is anticipated that, if unmanaged, EV charging will lead to an increased system

[18] See the *RRAS 2022 Update – Volume III, Attachment 2*, page 24.
[19] See the *RRAS 2022 Update – Volume III, Attachment 2*, page 26.

peak during the evening as customers begin to charge their EVs when arriving home at the end of their day.

Figure 3 shows forecasted unmanaged peak demand impacts of light-duty EV adoption in Newfoundland and Labrador from 2025 to 2040.

Figure 3
Forecast Unmanaged Peak Demand Impacts of Light-Duty EV Adoption (2025-2040)



If left unmanaged, the scenarios indicate that light-duty EVs will contribute 170 MW to 340 MW of peak demand by 2040. Increased peak demand would result in a need to create additional capacity on the electrical system, leading to higher overall costs for electricity customers in the province. For example, based on current estimates of marginal capacity costs, an increase in peak demand of approximately 170 MW by 2040 would result in higher system capacity costs of approximately $200 million over this period.[20]

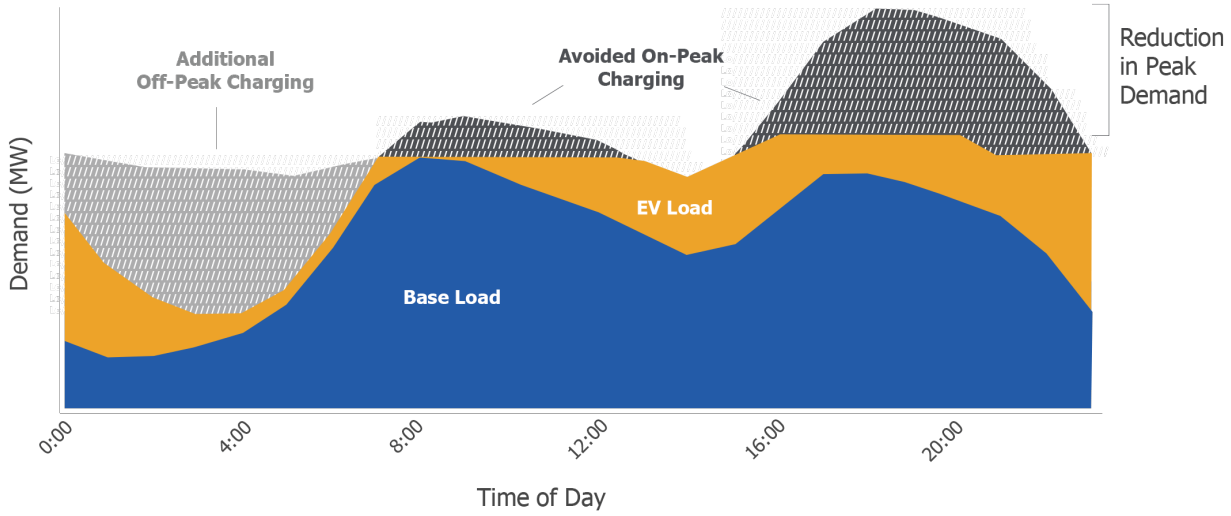
[20] Calculated on a net present value basis using the forecast unmanaged peak demand impact of light-duty EV adoption from 2024 to 2040 and Hydro's estimates of marginal capacity costs in its January 2022 update.

3.3 EV Load Management Strategies

Managing the peak demand impacts of EV adoption will require shifting the charging of EVs to a period when spare capacity is available, such as an overnight period when demand on the electrical system is lowest.

Figure 4 illustrates how EV load could drive a new evening peak if unmanaged and the opportunity to shift EV load to an overnight period when spare capacity is available. [21]

Figure 4
Island Interconnected System Load Shape with EV Load Management
(Illustrative Example)



Light-duty EVs represent the highest portion of EV adoption in Newfoundland and Labrador and are often plugged in for longer periods of time than what is required to gain a full charge. This creates flexibility to shift light-duty EV load and mitigate peak demand impacts with minimal disruption to customers. [22]

[21] Figure 4 is based on a scenario modeled by Dunsky as part of a previous *Conservation Potential Study*. See Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application, Volume 2, Schedule C, Conservation Potential Study,* page 114, Figure 6-18.

[22] See the *RRAS 2022 Update – Volume III, Attachment 2*, page, 17.

There are two primary strategies to manage light-duty EV load: active load management and passive load management.[23] Active load management involves a utility exerting direct control over when a vehicle charges, using preset control strategies or other mechanisms with the ability for participants to opt out of demand response events. Passive load management relies on participants' decisions to opt in to demand response events in response to information or incentives provided by the utility.

Both active and passive load management require customer education, incentivization of customer participation and access to technologies to control a vehicle's charging. The most common technologies used to control vehicle charging are Level 2 smart chargers that are equipped with wireless or cellular communication,[24] or vehicle telematics via an EV's onboard computer system.[25]

Active and passive load management strategies provide different costs and benefits. Passive load management provides less certainty about customer response and peak demand savings, but also typically presents lower implementation costs. Active load management can present a higher cost, but typically achieves greater peak demand savings and greater ability to mitigate a potential snapback in charging that could create a new peak.[26]

Whether active or passive load management should be pursued depends on customer acceptance, associated costs and system benefits in each jurisdiction.

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[23] See the *RRAS 2022 Update – Volume III, Attachment 2,* page, 17.

[24] Level 2 chargers are 240-volt charging stations for homes. Level 2 chargers are considered "smart" if they communicate through a wireless or a cellular network and can often be paired with user applications to provide data and allow users to control the charger remotely.

[25] Vehicle telematics use the onboard computer system of an EV to transmit and receive vehicle data. Vehicle telematics is becoming a standard feature among newer makes and models of vehicles. Vehicle telematics can be utilized for demand response to track and control when a customer charges their EV.

[26] A snapback refers to the re-emergence of a system peak immediately following a demand response event as customers choose to commence vehicle charging. For example, if customers are incented to avoid charging between 5:00 pm and 10:00 pm, it may lead to increased EV charging activity beginning after 10:00 pm, which could result in the emergence of a new system peak.

3.4 Canadian Utility Practice

Managed EV charging is a focus area for many Canadian electric utilities and has recently emerged as part of utilities' portfolios of demand response initiatives. As transportation electrification increases across the country, utilities are evaluating options and determining the optimal EV load management strategies for their electricity systems.

Utilities throughout Canada are offering EV load management pilots to small samples of EV drivers in their service territories. This allows utilities to test and collect data on charging behaviours and managed EV charging strategies, technologies and incentives.

Newfoundland Power surveyed 19 electric utilities across Canada and identified 10 utilities that have concluded or are currently completing or developing EV load management pilot projects. Of these 10 utilities, two utilities have used the results of their pilot projects to launch fulsome programs to manage EV charging load.

Utilities' EV load management pilot projects generally range in duration from one to three years with participant counts ranging from 20 to 600. Utilities have chosen to use either active or passive load management strategies, or both, during their pilot projects. As examples, FortisBC, BC Hydro, Nova Scotia Power and Hydro-Québec have explored active load management strategies. Utilities in Ontario and Alberta have explored passive load management strategies. FortisAlberta has chosen to explore both active and passive load management.

The most commonly used technology in utilities' pilot projects is Level 2 smart chargers. An emerging trend is the use of vehicle telematics. Vehicle telematics are currently being utilized in more recent pilot projects, such as those being conducted by FortisAlberta and Nova Scotia Power. FortisBC is also developing an EV managed charging program that will use vehicle telematics.

A combination of incentives are typically implemented for utility pilot projects, including up-front incentives to encourage enrollment and participation incentives for taking part in load management events. Enrollment incentives range from $25 to $250 and can include rebates for Level 2 smart chargers. Participation incentives can be flat rates awarded monthly or annually, or by kWh of load shifted.

Attachment B provides the detailed results of Newfoundland Power's survey of Canadian utility practice with respect to EV load management strategies.

4.0 EV Load Management Pilot Project

4.1 General

Newfoundland Power is proposing to implement an EV Load Management Pilot Project prior to the widespread adoption of EVs in the coming years. The Company consulted with Hydro in developing the proposed pilot project and consultations will continue throughout implementation. Hydro's letter of support for the pilot project is provided as Attachment C.

The objective of the EV Load Management Pilot Project is to assess the cost-effectiveness of strategies to shift the charging of light-duty EVs to off-peak periods. An assessment is appropriate in the province at this time as it will inform future customer programs to manage EV load and associated system costs prior to the widespread adoption of EVs. The results will be used by Newfoundland Power and Hydro to inform future programs for electricity customers throughout the province.

This approach is consistent with sound public utility practice and the utilities' obligation to provide least-cost, reliable service to customers pursuant to the provincial power policy.

To assess the cost-effectiveness of EV load management strategies, the pilot project will collect information on:

(i) EV owners' normal EV charging behaviours in the province, including the frequency and timing of charging and associated system impacts;

(ii) The amount of EV load that can be shifted based on customers' response to, and acceptance of, passive and active load management strategies; and

(iii) The costs and challenges associated with implementing load management strategies in the province, including the use of different technologies such as Level 2 smart chargers and vehicle telematics.

The collection of this information would provide the data necessary to measure the cost-effectiveness of EV load management strategies as part of the utilities' next multi-year CDM and electrification plan, which is expected to be implemented starting in 2026.[27]

4.2 Scope

The pilot project will seek to recruit up to 200 participants who own light-duty EVs in Newfoundland Power's service territory.[28] The pilot project will target at-home charging and will be limited to residential participants, which presents the greatest opportunity for load management.[29]

Participants will be required to have access to either vehicle telematics or Level 2 smart chargers. The use of both technologies will allow Newfoundland Power to gain experience with each and is necessary to ensure a reasonable sample size. This is largely because vehicle

[27] Newfoundland Power's and Hydro's current plan for customer CDM and electrification initiatives spans from 2021 to 2025, after which an updated plan will be prepared.

[28] A sample size of 200 participants is considered statistically significant based on the population of EVs in the province as of the first quarter of 2023. However, the sample size may vary depending upon EV owners' interest in participating in the pilot project. A final sample size will be determined in consultation with a third-party service provider based on the interest generated through advertisements.

[29] Approximately two thirds of EV charging generally occurs at home. See Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application*, Volume 2, Schedule D, page 3.

telematics that can be used to manage EV charging is currently limited to only newer models of EVs, and only certain models of EVs are compatible with Level 2 smart chargers.[30]

To manage the pilot project budget, priority will be given to prospective participants with vehicle telematics or who already have an eligible Level 2 smart charger installed.[31] Consistent with the experience of other utilities, it is also expected that a portion of participants will require the installation of a new Level 2 smart charger to ensure a reasonable sample size. However, given the unavailability of data in relation to the province's EV population, it is unknown at this time how many participants will require the supply and installation of a new Level 2 smart charger as part of the pilot project.[32]

A third-party service provider with the appropriate technology platform and experience executing similar projects will be contracted to administer the pilot project.[33] The service provider will be required to coordinate administration, detailed design and resourcing to deliver the project. This will include the procurement and installation of Level 2 chargers, as needed, and the secure collection, storing and reporting of participants' data.

Once participants are recruited and the technology is established, participants will undergo a period of monitoring to establish a baseline of their typical EV charging behaviours. Demand response events will then be held over the two ensuing winter seasons by offering participants financial incentives to shift their charging to off-peak periods.[34] The demand response events will test both passive (i.e. opt-in) and active (i.e. opt-out) load management strategies to gauge the effectiveness of each in shifting EV load to off-peak periods.

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30 For example, Tesla vehicles are not compatible with Level 2 chargers for managed charging and the Hyundai Kona, Chevrolet Bolt and Nissan Leaf are not compatible with vehicle telematics for managed charging.

31 Level 2 smart charger eligibility will depend on the selected third-party service provider. Customers' existing chargers must be "smart" and compatible with the service provider to be considered eligible.

32 Data is not currently available to assess the penetration of eligible Level 2 smart chargers or vehicle models with telematics in Newfoundland Power's service territory. For the purposes of developing a budget estimate, the pilot project assumes that up to 75% of participants may require the installation of a new Level 2 smart charger. The Level 2 smart charger will remain the property of the participant once the pilot concludes.

33 A Request for Proposals will be issued to obtain the services of a third-party service provider.

34 The specific incentive amount will be determined in coordination with the third-party service provider. A typical demand response event incentive is $20 per month.

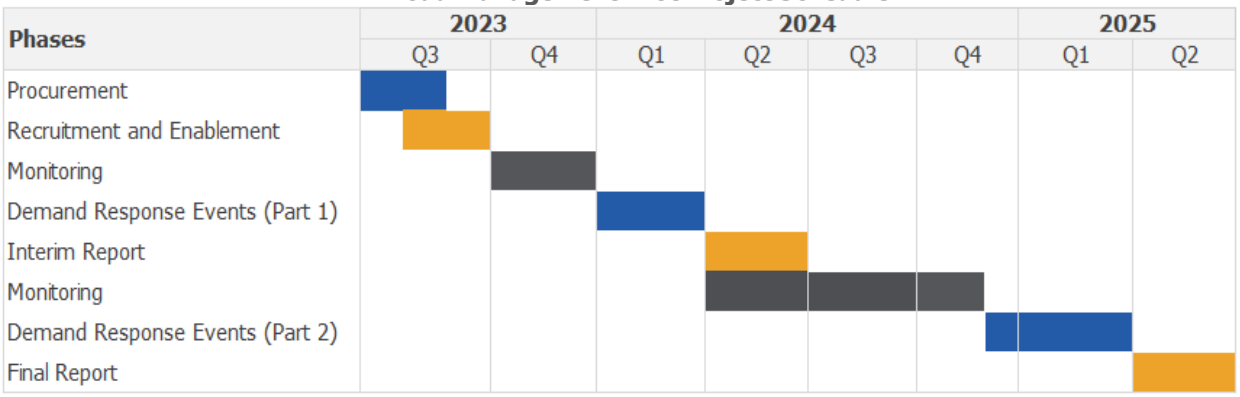
The selected third-party service provider will be required to provide an interim report on the pilot project following the first demand response events in Winter 2024. The interim report will include analyses of participants' baseline charging behaviours and acceptance of demand response events, along with any other pertinent information.

A final report will then be completed following the second demand response events in Winter 2025. The final report will include pilot project outcomes and recommendations based on the findings. The outcomes will include the achieved peak demand reduction and the feasibility of scaling piloted initiatives to full customer programs.

4.3 Schedule

Figure 5 provides an overview of the schedule for the EV Load Management Pilot Project.

Figure 5
EV Load Management Pilot Project Schedule



Procurement, participant recruitment and enablement, including equipment installation, is proposed to begin in the third quarter of 2023. A baseline of customers' charging behaviours will be established in the fourth quarter of 2023, followed by demand response events in the first quarter of 2024. Customers' charging behaviours will be monitored until the second demand response events are launched in the fourth quarter of 2024. The pilot project will conclude in the second quarter of 2025 with the delivery of a final report.

4.4 Cost

Table 2 provides a breakdown of expenditures proposed for the 2023-2025 *EV Load Management Pilot Project.*

Table 2
EV Load Management Pilot Project Costs
($000s)

Cost Category	2023	2024	2025
Labour	165	105	79
Other	704	251	200
Total	869	356	279

The EV Load Management Pilot Project is estimated to cost $1,504,000, including $869,000 in 2023, $356,000 in 2024 and $279,000 in 2025. Labour costs include program administration and delivery. Other costs primarily include costs associated with contracting a third-party service provider to deliver the pilot project. Other costs also include approximately $10,000 for advertising to recruit participants.

Actual costs to deliver the EV Load Management Pilot Project are proposed to be recovered through the Electrification Cost Deferral Account, as approved by the Board in Order No. P.U. 3 (2022).

Attachment A
Electrification Cost Deferral Account Definition

NEWFOUNDLAND POWER INC.
ELECTRIFICATION COST DEFERRAL ACCOUNT

Electrification Cost Deferral Account

This account shall be charged with the costs incurred in implementing the Customer Electrification Program Portfolio in accordance with Board orders and approved electric vehicle charging infrastructure capital costs until otherwise ordered by the Board.

Electrification program costs include: detailed program development, promotional materials, advertising, pre and post customer installation checks, incentives, processing applications and incentives, training of employees and trade allies, program evaluation costs and the costs to operate Company-owned charging stations.

This account shall also be charged the costs of major studies such as pilot programs, comprehensive customer surveys and potential studies that cost greater than $100,000.

This account shall be credited with the receipt of government funding related to electrification programs and electric vehicle charging infrastructure as well as any revenues associated with the operation of Company-owned charging stations.

The account shall exclude electrification expenditures that are general in nature and not associated with a specific electrification program, such as costs associated with providing electrification awareness, and general planning, research and supervision costs.

The account shall be increased (reduced) by an interest charge (credit) on the balance in the account at the beginning of the month, at a monthly rate equivalent to the mid-point of the Company's allowed rate of return on rate base. The account will not be included in the Company’s calculation of rate base until otherwise ordered by the Board.

Transfers to, and from, the proposed account will be tax-effected.

This account will maintain a linkage of all costs recorded in the account to the year the cost was incurred.

Recovery of annual amortizations of costs in this account shall be through the Company’s Rate Stabilization Clause or as otherwise ordered by the Board.

Attachment B
Survey of Canadian Utility Practice on EV Load Management Strategies

Table B-1
Survey of Canadian Utility EV Load Management Strategies[35]

Utility	Overview	Status	Sector	Strategies	Timeframe	Participants	Incentives[36]
FortisAlberta	FortisAlberta's "EV Smart Charging Pilot" will provide insights into where and when residential EV charging is occurring and how best to respond to minimize distribution costs. The pilot will explore active and passive EV load management using vehicle telematics through a third-party vendor. The pilot was initiated in January 2023 with an expected duration of one year.	Ongoing	Residential	Active and Passive	1 Year	240 (goal of 600)	$50 for enrollment; $100 for participation
ENMAX	ENMAX's "Charge Up" pilot program first launched in 2019 to provide insights into when drivers charge their EVs and for how long. The next phase of the pilot launched in 2021 to see what factors most influence charging behavior. The pilot used passive load management through a monitoring device that leverages vehicle telematics and a small number of customers used Level 2 smart chargers. The pilot first established a baseline for participants and then tested two different incentive structures to gauge which had the greatest influence.	Complete	Residential	Passive	3 Years	250	Charger rebate; $0.035 cents/kwh of charging off peak
FortisBC	FortisBC launched a demand response program in 2022 to approximately 20 Kelowna residents. The pilot explores active EV load management using Level 2 smart chargers via a third-party vendor.	Ongoing	Residential	Active	1 Year	20	$50 for enrollment; $50 for participation

[35] Sample of utilities selected to gain a cross-Canada view. The information presented was collected from a combination of publicly available sources and, in some cases, telephone interviews with representatives from the utilities.

[36] Enrollment incentives are provided up front for registering to participate in a pilot project. Participation incentives are contingent upon a customer's success shifting their EV load to an off-peak period.

Table B-1 Survey of Canadian Utility EV Load Management Strategies[35]							
Utility	**Overview**	**Status**	**Sector**	**Strategies**	**Timeframe**	**Participants**	**Incentives[36]**
BC Hydro	BC Hydro completed a demand response pilot using EV charging infrastructure from 2020 to 2022 to obtain a better understanding of how to manage EV load on the electricity system. Upon completion of the pilot, BC Hydro rolled out a managed charging program for EVs that provides a purchase incentive for a Level 2 smart charger and an annual credit in exchange for active management of the charger.	Complete	Residential	Active	3 Years	Unknown	$45 annually for participation
Nova Scotia Power	Nova Scotia Power's "Electric Vehicle Smart Charging Pilot" is an active load management charging pilot built around a third-party mobile app. Participants provide Nova Scotia Power with control of their EV charging through the app using vehicle telematics to help lower overall power usage from EVs at peak times. The pilot is running from 2022 to 2023. Customers receive a monthly incentive for participation.	Ongoing	Residential	Active	1 Year	120	$20 monthly for participation
Nova Scotia Power	Nova Scotia Power's "Smart Grid Nova Scotia ChargePoint Pilot Program" was launched in 2021 and was originally planned for two years, but has been extended. This pilot, which has approximately 100 participants, provides a full rebate for a Level 2 smart charger from ChargePoint. In exchange, Nova Scotia Power is able to use active load management to control EV charging.	Ongoing	Residential	Active	2.5 Years	100	Charger rebate

Table B-1
Survey of Canadian Utility EV Load Management Strategies[35]

Utility	Overview	Status	Sector	Strategies	Timeframe	Participants	Incentives[36]
Hydro-Québec	Hydro-Québec's "Hilo EV Challenges" pilot began in 2021 and ran for one year. It has since become a full program. Participants earned cash rewards for allowing Hydro-Québec to actively manage their charging during peak periods. Rewards were dependent on the amount of load shifted. The goal was to shift charging outside of peak periods and delay charging following a prolonged power outage. This was an active load management pilot that used Level 2 smart chargers.	Complete	Residential	Active	1 Year	Unknown	$0.55/kwh of load reduction
London Hydro	London Hydro partnered with a third-party vendor to better understand customers' charging behaviours, the impact of charging loads on the electricity grid and the role of incentives in shifting charging demand to off-peak times. The pilot ran for one year using a mobile app to monitor charging through monitoring devices and Level 2 smart chargers. Targeting passive load management, the mobile app provided real-time data to participating customers with on/off control, estimated the cost per charging session and expected mileage per charge for better planning, and provided reports on historical charging sessions.	Complete	Residential	Passive	1 Year	30-50	Free monitoring device or charger; $50 for enrollment; $100-150 for participation
Hydro Ottawa	Hydro Ottawa plans to use artificial intelligence to manage EV charging in localized areas during peak demand periods. This pilot is planned to begin in September 2023 and is expected to last for two and half years.	In Develop-ment	Residential	Active	2.5 Years	Goal of 100+	$50 for enrollment; $15 monthly for participation

Table B-1
Survey of Canadian Utility EV Load Management Strategies[35]

Utility	Overview	Status	Sector	Strategies	Timeframe	Participants	Incentives[36]
Toronto Hydro	Toronto Hydro's "Electric Vehicle Smart Charging Pilot Program" was originally a two-year pilot program offered to 100 customers to understand EV charging patterns and behaviours in Toronto, including the duration, frequency and time of charging. Customers received an annual participation credit. The pilot used a monitoring device and, through passive load management, allowed participants to control their charging via an app.	Ongoing	Residential	Passive	2 Years	100	$50 annually for participation
SaskPower	SaskPower's "Smart Charge Rewards" pilot ran from 2021 to 2022 and used a monitoring device to collect and transmit vehicle information to understand EV charging impacts on the grid. Customers were given an incentive to enroll in the program and allow SaskPower to collect charging data.	Complete	Residential	Data Collection Only	1 Year	100	Free monitoring device; $25 for enrollment
SaskPower	SaskPower is planning a passive managed charging pilot expected to begin in June 2023 and will collect and transmit vehicle data using vehicle telematics and a monitoring device. The pilot will include a control group and two other groups that will test passive strategies and incentives.	In Develop-ment	Residential	Passive	2 years	400	$25 for enrollment; $10 plus $15 monthly or $0.06 /kwh for participation

Attachment C
Letter of Support from Newfoundland and Labrador Hydro

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

June 2, 2023

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

Attention: Cheryl Blundon
Director of Corporate Services and Board Secretary

Re: EV Load Management Pilot Project

Please find enclosed Newfoundland and Labrador Hydro's ("Hydro") letter of support regarding Newfoundland Power Inc.'s ("Newfoundland Power") EV[1] Load Management Pilot Project Application.

EV System Impacts

EV adoption is growing rapidly across North America and Newfoundland and Labrador. The Government of Canada has proposed regulations which will require 100% of new vehicle sales in 2035 to be zero emission.

By 2033, Hydro expects there to be in excess of 65,000 EVs in Newfoundland and Labrador. Without intervention by the Utilities (Hydro and Newfoundland Power), these 65,000 EVs are forecast to contribute over 100 MW to system peak. Investing in a pilot program which will enable a portion of this load to be shifted into non-peak hours is consistent with good utility practice and the Utilities obligation for reliable service which is consistent with least cost.

Hydro's Role in EV Demand Response

As the utility responsible for the bulk generation and transmission in our provinces interconnected systems, Hydro will need to make investments to serve customer requirements from EVs. It is Hydro's view that demand response will be a critical and cost effective investment as more EVs are purchased and operated in this jurisdiction.

The vast majority of EV adoption to date has taken place in more urban areas of the province, and these EVs owners are typically customers of Newfoundland Power.[2] As such, working with Newfoundland Power in the design, implementation, and review of results of this pilot program is the most cost-effective approach to understanding how EV load can best be managed in our province.

[1] Electric Vehicle ("EV").
[2] Since administering the EV Rebate Program on behalf of the Government of Newfoundland and Labrador, Hydro has rebated fewer than 10 EVs in its service territory.

Conclusion

Hydro supports Newfoundland Power's EV Load Management Pilot Project Application and believes its approval will result in lower system costs for customers following greater adoption levels of EVs.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

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

ecc:

Board of Commissioners of Public Utilities
Jacqui H. Glynn
PUB Official Email

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