December 16, 2020

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: 2021 Electrification, Conservation and Demand Management Application

A. Introduction

Enclosed please find Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application* (the "Application").

The Application includes a new, multi-year plan developed by Newfoundland Power and Newfoundland and Labrador Hydro to guide customer programming over the 2021 to 2025 period (the "2021 Plan"). The 2021 Plan was developed in consultation with the Provincial Government and is consistent with the Board's recommendations as part of the *Reference on Rate Mitigation Options and Impacts.*

B. Customer Programs

The 2021 Plan continues longstanding conservation and demand management ("CDM") programs and introduces customer electrification programs for the first time.

Both CDM and electrification programs are cost-effective from a customer and a utility perspective. Planned electrification programs will also provide rate mitigating benefits to customers over the long term.

Industry research has confirmed that planned customer programs for CDM and electrification are consistent with sound utility practice.

Newfoundland Power Inc.
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C. Application Proposals

Customer CDM programs will continue to be implemented in a manner consistent with existing Board orders. This includes existing Board orders related to the economic evaluation of programs and the recovery of program costs. Accordingly, the Application does not contain any proposals related to customer CDM programs.

The Application contains 3 proposals in relation to customer electrification programs:

(i) The Application proposes that the Board approve a Modified Total Resource Cost test for the economic evaluation of customer electrification programs. The proposed Modified Total Resource Cost is consistent with sound utility practice and is conceptually similar to the test previously approved by the Board for the evaluation of customer CDM programs.

(ii) The Application proposes that the Board approve an Electrification Cost Deferral Account to provide for recovery of 2021 costs associated with implementing customer electrification programs. The Electrification Cost Deferral Account is proposed to operate in a manner similar to the existing CDM Cost Deferral Account.

(iii) The Application proposes that the Board approve approximately $1.5 million in supplemental capital expenditures for 2021 to commence construction of an Electric Vehicle Charging Network. The construction of an Electric Vehicle Charging Network is necessary to enable the successful delivery of customer electrification programs.

Approval of these proposals will enable the delivery of customer electrification programs in 2021. This, in turn, will enable the earliest feasible realization of the associated rate mitigating benefits for customers.

D. Conclusion

In accordance with the Board's March 17, 2020 notice regarding the activation of its Business Continuity Plan, Newfoundland Power is providing the enclosed in electronic format only.

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If you have any questions, please contact the undersigned at your convenience.

Yours truly,

Kelly C. Hopkins
Corporate Counsel

ec. Shirley A. Walsh
Newfoundland and Labrador Hydro

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Newfoundland Power Inc.
2021 Electrification, Conservation and Demand Management Application

TABLE OF CONTENTS

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

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to sections 58 and 80 of the Act, for the approval of an economic test and a deferral account to provide for recovery of costs proposed to be incurred in 2021 for customer electrification programs; and

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to section 41(3) of the Act, for the approval of supplemental 2021 capital expenditures related to the construction of an Electric Vehicle Charging Network.

2021 Electrification, Conservation and Demand Management Application
The Application

IN THE MATTER OF the Act; and

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to sections 58 and 80 of the Act, for the approval of an economic test and a deferral account to provide for recovery of costs proposed to be incurred in 2021 for customer electrification programs; and

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to section 41(3) of the Act, for the approval of supplemental 2021 capital expenditures related to the construction of an Electric Vehicle Charging Network.

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

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

A. Background

1. Newfoundland Power 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* ("EPCA").

2. Newfoundland Power and Newfoundland and Labrador Hydro (the "Utilities") have delivered customer programs for conservation and demand management ("CDM") under joint, multi-year plans since 2009.

3. With respect to existing CDM programs:
   (a) By Order No. P.U. 13 (2009), the Board approved a Conservation Cost Deferral Account to provide for the deferred recovery of CDM program costs;
   (b) By Order No. P.U. 13 (2013), the Board approved a change in the Conservation Cost Deferral Account definition and the amortization of annual CDM program costs over 7 years through the annual Rate Stabilization Account adjustment; and
   (c) By Order No. P.U. 18 (2016), the Board approved the use of the Total Resource Cost test and the Program Administrator Cost test to evaluate the cost-effectiveness of customer CDM programs.

4. The Utilities' current plan for customer CDM programs was filed with the Board as part of Newfoundland Power's *2016/2017 General Rate Application.* The current plan guided customer CDM programs over the period 2016 to 2020.

5. In February 2020, the Board recommended that the Utilities work with the Provincial Government on a comprehensive and coordinated approach to develop the most appropriate electrification and CDM programs for the Province.

B. Customer Electrification Portfolio

6. In consultation with the Provincial Government, the Utilities have developed a comprehensive and coordinated plan for the delivery of customer CDM and electrification programs over the period 2021 to 2025 (the "2021 Plan").

7. The 2021 Plan continues longstanding, cost-effective customer CDM programs. These programs will be delivered in a manner consistent with past orders of the Board, as outlined in Paragraph 3 of the Application.

8. The 2021 Plan's portfolio of customer electrification programs (the "Customer Electrification Portfolio") includes:
   (a) Customer programs to promote the adoption of electric vehicles and the electrification of other end uses;
   (b) Customer education and research relating to the electrification of end uses, including transportation electrification; and
   (c) Utility investment in electric vehicle charging infrastructure.

9. Implementation of the Customer Electrification Portfolio will provide benefits to customers that are reasonably estimated to exceed the costs of implementing that portfolio.

10. Customer programs under the Customer Electrification Portfolio are proposed to pass a Modified Total Resource Cost test to ensure the programs are economic for customers and the Utilities. The Modified Total Resource Cost test is consistent with sound utility practice and tests previously approved by the Board for customer CDM programs.

11. As part of implementing the Customer Electrification Portfolio, Newfoundland Power will incur costs in 2021 for customer program delivery and capital expenditures to construct an Electric Vehicle Charging Network.

12. Program delivery costs for the Customer Electrification Portfolio are:
   (a) Reasonable and prudent and properly chargeable to an operating account, as required by Section 80(2) of the Act;
   (b) Consistent with the management and operation of sources and facilities for the production, transmission and distribution of power in a manner that results in power being delivered to customers in the Province at the lowest possible cost consistent with reliable service, as required by Section 3(b)(iii) of the EPCA; and
   (c) Justified under an economic test consistent with generally accepted sound public utility practice, as required by Section 4 of the EPCA.

13. Supplemental capital expenditures proposed for 2021 provide for the construction of an Electric Vehicle Charging Network. The construction of an Electric Vehicle Charging Network is necessary to achieve the customer benefits associated with the Customer Electrification Portfolio.

C. Proposed 2021 Cost Recovery Deferral

14. The costs to implement the Customer Electrification Portfolio were not included in the 2020 test year costs approved by the Board pursuant to Order No. P.U. 2 (2019), which form the basis of Newfoundland Power's current customer rates.

15. The Application proposes the Board approve the creation of a deferral account (the "Electrification Cost Deferral Account") to provide for the deferred recovery (net of tax) of actual program delivery costs associated with implementing the Customer Electrification Portfolio in 2021, which are estimated at $935,000.

16. Exhibit 1 to the Application provides the proposed definition of the Electrification Cost Deferral Account.

D. Proposed 2021 Capital Expenditures

17. The Application proposes the Board approve $1,538,000 in supplemental capital expenditures for 2021 to commence construction of an Electric Vehicle Charging Network. The construction of an Electric Vehicle Charging Network is necessary to enable the successful delivery of customer electrification programs.

18. Supplemental capital expenditures proposed for construction of an Electric Vehicle Charging Network in 2021 cannot reasonably be deferred until a future annual capital budget application.

19. Exhibit 2 to the Application provides a report on 2021 supplemental capital expenditures for the construction of the Electric Vehicle Charging Network.

E. Order Requested

20. Newfoundland Power requests that the Board make an Order approving:
    (a) The economic evaluation of customer electrification programs by use of a Modified Total Resource Cost test;
    (b) Pursuant to Sections 58 and 80 of the Act, the Electrification Cost Deferral Account to provide for the deferred recovery, until a further Order of the Board, of 2021 costs (net of tax) related to the implementation of the Customer Electrification Portfolio; and
    (c) Pursuant to Section 41(3) of the Act, supplemental 2021 capital expenditures associated with the construction of an Electric Vehicle Charging Network.

DATED at St. John's, Newfoundland and Labrador, this 16th day of December, 2020.

NEWFOUNDLAND POWER INC.

Kelly C. Hopkins
Counsel to Newfoundland Power Inc.
P.O. Box 8910 55 Kenmount Road
St. John's, NL A1B 3P6

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

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to sections 58 and 80 of the Act, for the approval of an economic test and a deferral account to provide for recovery of costs proposed to be incurred in 2021 for customer electrification programs; and

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to section 41(3) of the Act, for the approval of supplemental 2021 capital expenditures related to the construction of an Electric Vehicle Charging Network.

AFFIDAVIT

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

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

2. 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 St. John's
in the Province of Newfoundland and
Labrador this 16th day of December, 2020:

Barrister

Byron Chubbs

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

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to sections 58 and 80 of the Act, for the approval of an economic test and a deferral account to provide for recovery of costs proposed to be incurred in 2021 for customer electrification programs; and

IN THE MATTER OF an application by Newfoundland Power Inc., pursuant to section 41(3) of the Act, for the approval of supplemental 2021 capital expenditures related to the construction of an Electric Vehicle Charging Network.

2021 Electrification, Conservation and Demand Management Application Evidence

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TABLE OF CONTENTS

1.0 APPLICATION OVERVIEW

Newfoundland Power Inc. ("Newfoundland Power" or the "Company") and Newfoundland and Labrador Hydro (collectively the "Utilities") have developed a new plan to guide customer programs over the 2021 to 2025 period. The plan continues longstanding conservation and demand management ("CDM") programs and introduces customer electrification programs.[1]

The introduction of customer electrification programs is consistent with the Newfoundland and Labrador Board of Commissioners of Public Utilities' (the "Board") recommendation as part of the *Reference on Rate Mitigation Options and Impacts.* A Net Present Value analysis has confirmed that planned electrification programs will provide rate mitigating benefits to customers over the long term.

The Application contains 3 proposals in relation to customer electrification programs.

First, the Application proposes the approval of a Modified Total Resource Cost test for the economic evaluation of customer electrification programs. The Modified Total Resource Cost test is conceptually similar to tests previously approved by the Board for customer CDM programs.

Second, the Application proposes the approval of an Electrification Cost Deferral Account to provide for the recovery of 2021 costs associated with implementing customer electrification programs. The proposed account will operate in a manner similar to the existing CDM Cost Deferral Account.

[1] Electrification is the process of converting customer end uses from fossil fuels to electricity.

Third, the Application proposes the approval of supplemental capital expenditures for 2021 to commence construction of an Electric Vehicle Charging Network. The construction of an Electric Vehicle Charging Network is necessary to realize the rate mitigating benefits of customer electrification programs.

Industry research shows Newfoundland Power's customer electrification programs, proposed economic evaluation and infrastructure investments are consistent with sound utility practice.[2]

Commencing implementation of electrification programs in 2021 will enable the earliest feasible realization of the associated rate mitigating benefits for customers. The rate mitigating benefits of customer electrification are consistent with the delivery of least-cost, reliable service.[3]

Overall, the Application's proposals are consistent with past practice of the Board, sound utility practice and least-cost service delivery. The Application's proposals are therefore reasonable and should be approved.

The continued delivery of CDM programs is necessary to meet customers' expectations. Customers continue to express significant interest in CDM programs. The customer benefits realized through CDM programs are substantial. All planned CDM programs over the 2021 to 2025 period continue to be cost-effective from both a customer and a utility perspective.

[2] Section 4 of the *Electrical Power Control Act, 1994 (*"EPCA") requires the Board to apply tests consistent with generally accepted sound utility practice.

[3] Section 3(b)(iii) of the EPCA requires, in effect, that customers receive reliable service at the lowest possible cost.

Customer CDM programs over the 2021 to 2025 period will be implemented in a manner that complies with existing orders of the Board. This includes existing Board orders concerning the economic evaluation and recovery of costs associated with customer CDM programs. Accordingly, the Application does not contain any proposals relating to the continued implementation of customer CDM programs.

2.0 BACKGROUND

2.1 Customer Programs Historically

The Utilities have delivered CDM programs to customers under joint, multi-year plans since 2009.[4] These multi-year plans have provided a coordinated and comprehensive approach to delivering customer programs. The current multi-year plan provides for customer programs to year-end 2020.

Customer interest in Newfoundland Power's CDM programs has been significant.

Since 2009, customer participation in CDM programs has included: (i) approximately 63,000 on-bill rebates for energy-efficient products such as insulation;[5] (ii) approximately 3.5 million instant rebates for energy-efficient products such as LED bulbs;[6] and (iii) an average of 60,000

[4] The *Five-Year Energy Conservation Plan: 2008-2013* was filed in October 2008 by Newfoundland Power as part of its *2009 Conservation Cost Deferral Application* (see Volume 2, Supporting Documentation). The *Five-Year Energy Conservation Plan: 2012-2016* was filed with the Board as part of Newfoundland Power's *2013/2014 General Rate Application* (see Volume 2: Exhibits & Supporting Materials). The *Five-Year Conservation Plan: 2016-2020* was filed with the Board as part of Newfoundland Power's *2016/2017 General Rate Application* (see Volume 2: Exhibits & Supporting Materials).

[5] On-bill rebates are credited to a customer's monthly bill after submitting the required documentation. On-bill rebates are available for energy-efficient products such as insultation, heat recovery ventilators and thermostats.

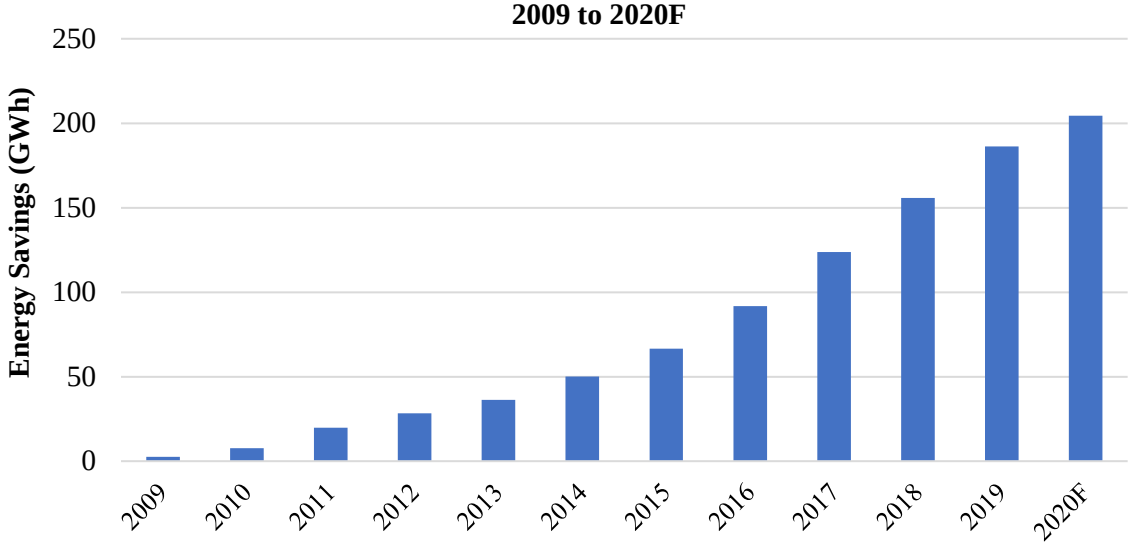
[6] Instant rebates provide at-the-cash discounts on smaller energy-efficient products, such as low-flow showerheads and weather stripping.

participants annually in a benchmarking program that provides customers with reports on their home energy usage.

The customer benefits of Newfoundland Power's CDM programs have been substantial.

Figure 1 shows the annualized energy savings achieved by the Company's customers through CDM programs over the period 2009 to 2020F.[7]

Figure 1
Newfoundland Power
Customer CDM Programs
Energy Savings
2009 to 2020F



Newfoundland Power's customers are forecast to achieve annualized energy savings of approximately 205 GWh in 2020. Cumulative energy savings are forecast to total 973 GWh over

[7] Energy savings from customer CDM programs are realized over many years. For example, insulation installed by a customer is expected to yield energy savings for 25 years. Insulation installed by a customer in 2020 will continue to provide energy savings each year until 2045. Annualized energy savings reflect the total savings realized each year over the lifetime of the technologies installed through each program.

the 2009 to 2020 period.[8] This exceeds the Company's targeted energy savings by approximately 11%.[9]

Peak demand savings are forecast to total 45 MW over the 2009 to 2020 period.

These energy and peak demand savings have reduced costs to customers from 2 perspectives. First, customers participating in CDM programs are forecast to realize electricity bill savings of approximately $118 million over the 2009 to 2020 period. Second, all Newfoundland Power customers are forecast to benefit from reduced system costs of approximately $137 million over this period.[10]

2.2 Prior Board Approvals

Newfoundland Power delivers customer CDM programs in a manner that complies with all applicable orders of the Board.

In Order No. P.U. 13 (2009), the Board approved the Conservation Cost Deferral Account to provide for deferred recovery of CDM program costs.[11] The Board approved continued use of the Conservation Cost Deferral Account in Order No. P.U. 43 (2009).[12]

[8] Cumulative energy savings represent the sum total of all annualized energy savings achieved over the period 2009 to 2020F.

[9] Newfoundland Power's cumulative energy savings target is 877 GWh ((973 GWh – 877 GWh) / 877 GWh = 0.11, or 11%).

[10] Lower system costs through customer CDM programs result from reduced energy costs through customers' energy savings, as well as reduced capacity costs through reductions in peak demand.

[11] See Order No. P.U. 13 (2009), page 2, lines 34 to 37.

[12] See Order No. P.U. 43 (2009), page 7, paragraph ii.

In Order No. P.U. 13 (2013), the Board approved a change in the definition and name of the currently titled Conservation and Demand Management Cost Deferral Account (the "CDM Cost Deferral Account"), and approved the amortization of deferred costs over 7 years.[13] The CDM Cost Deferral Account continues to provide for deferred recovery of CDM program costs over 7 years.

In Order No. P.U. 18 (2016), the Board approved the use of the Total Resource Cost test and the Program Administrator Cost test for evaluation of Newfoundland Power's CDM programs.[14] The Total Resource Cost test and the Program Administrator Cost test continue to be applied in the economic evaluation of customer CDM programs.

2.3 Customer Rate Mitigation

On September 5, 2018, the Provincial Government issued a reference to the Board on Muskrat Falls Project rate mitigation.[15] In determining rate mitigation options and impacts, the Board was directed to consider, among other issues, whether it is more advantageous for customers to maximize domestic load or maximize export sales.[16] The Board found that:

> *"[M]aximizing 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."*[17]

[13] See Order No. P.U. 13 (2013), page 60, paragraphs 12 and 13.
[14] See Order No. P.U. 18 (2016), page 50, paragraph 9.
[15] References to the Board are completed pursuant to Section 5 of the EPCA.
[16] The Reference Questions were: (i) options to reduce the impact of Muskrat Falls Project costs on electricity rates; (ii) the amount of energy and capacity from the Muskrat Falls Project required to meet domestic load and the amount available for export or load growth; and (iii) the potential electricity rate impacts of identified options. See correspondence from Minister Siobhan Coady to the Board, dated September 5, 2018.
[17] See *Reference to the Board: Rate Mitigation Options and Impacts, Muskrat Falls Project – Final Report*, February 7, 2020, page iii.

The Board recommended the Utilities and Provincial Government work together on a comprehensive and coordinated approach to developing the most appropriate programs for the Province.[18] Specifically, the Board recommended that a comprehensive plan for customer programs be finalized by the utilities and submitted to the Board in 2021.[19]

3.0 THE 2021 PLAN

3.1 General

The Utilities' *Electrification, Conservation and Demand Management Plan: 2021-2025* (the "2021 Plan") is consistent with the Board's recommendations as part of the *Reference on Rate Mitigation Options and Impacts.* The Utilities completed consultations with the Provincial Government over the course of developing the 2021 Plan.[20]

The 2021 Plan continues longstanding customer CDM programs and supporting initiatives (the "Customer CDM Portfolio").[21] The continued implementation of CDM programs is necessary to meet customers' expectations and to manage overall system costs.

[18] Ibid., page ii.
[19] Ibid., page 109.
[20] A letter of support from the Provincial Government in relation to the 2021 Plan is provided in Volume 2, 2021 Plan, Schedule M. In this letter, the Provincial Government states: *"The plan indicates the province's utilities are taking actions to begin addressing the electrification, and conservation and demand management (CDM) recommendations in the Board of Commissioners of Public Utilities Rate Mitigation Options and Impacts Report. The Board's report demonstrated clearly that these action areas have excellent potential to assist with our rate mitigation efforts."*
[21] Supporting initiatives for customer CDM programs include customer education, research and planning initiatives.

The 2021 Plan introduces customer electrification programs and supporting initiatives (the "Customer Electrification Portfolio").[22] The introduction of customer electrification programs will provide rate mitigating benefits to customers over the long term.

The Customer CDM Portfolio and Customer Electrification Portfolio are complementary. As customers' energy usage increases through electrification, it becomes increasingly important to manage impacts on system peak and related system costs through CDM. Both CDM and electrification programs also result in lower overall costs for participating customers.[23]

The Customer CDM Portfolio and Customer Electrification Portfolio were developed based on a comprehensive assessment of market potential conducted by Dunsky Energy Consulting (the "Potential Study").[24] The Potential Study identified the theoretical potential for electrification and CDM in the province, as well as practical means through which that potential may be achieved. Economic evaluations were then conducted to ensure all customer programs are consistent with the least-cost delivery of reliable service.

[22] Supporting initiatives for customer electrification programs include customer education, research and planning initiatives, as well as investments in electric vehicle infrastructure.

[23] For example, a customer who upgrades their insulation and thermostats through a CDM program would experience overall net savings of approximately $8,800 over the life of those technologies. Similarly, a customer who purchases an electric vehicle would experience overall net savings of approximately $5,200 through reduced maintenance and fuel costs over the life of that vehicle. See Volume 2, 2021 Plan, page 29, Figure 7.

[24] The Potential Study is provided in Volume 2, 2021 Plan, Schedule C.

3.2 Customer CDM Portfolio

3.2.1 Planned Customer Portfolio

The Potential Study determined there continues to be potential for cost-effective customer CDM programs.[25]

Newfoundland Power's Customer CDM Portfolio is substantially the same as the portfolio of programs established as part of the previous multi-year plan filed with the Board.[26] Planned changes to customer CDM programs include:

(i) Adjustment of the Business Efficiency Program in 2021. The adjustment will better support demand management opportunities in instances where commercial facilities convert space and water heating to electric.

(ii) Introduction of a new low-income program in 2022. This program will provide income-qualified customers with an energy efficiency kit at no cost to the participant.

(iii) Expansion of the on-bill rebate program for insulation in 2022. This program will now include rebates for duct insulation and air sealing to further support customers in managing space heating costs.

(iv) Conclusion of the Instant Rebates Program after 2022. Planned changes to efficiency regulations suggest that LED bulbs, which are the focus of the Instant Rebates Program, will become the market standard at that time.[27]

[25] See Volume 2, 2021 Plan, Section 3.2 Conservation and Demand Management.
[26] For a detailed description of each customer CDM program, see Volume 2, 2021 Plan, Schedule F, pages 9 to 25.
[27] See Volume 2, 2021 Plan, page 19, footnotes 49 and 50.

Industry research confirms Newfoundland Power's Customer CDM Portfolio is consistent with current industry practice.[28]

Table 1 provides the annualized energy savings attributable to each program included in the Customer CDM Portfolio over the period 2021 to 2025.

Table 1
Newfoundland Power
Customer CDM Programs
Annualized Energy Savings
2021-2025
(GWh)

Program	2021	2022	2023	2024	2025	Total
Insulation and Air Sealing	51.6	57.7	63.9	70.4	77.7	321.3
Thermostat	26.5	29.2	31.6	34.0	36.2	157.5
Heat Recovery Ventilator	1.7	2.0	2.3	2.6	2.9	11.5
Instant Rebates	75.0	79.6	77.0	75.6	75.4	382.6
Benchmarking	14.0	14.0	14.0	14.0	14.0	70.0
Low Income	-	3.2	6.4	8.9	11.4	29.9
Business Efficiency	47.0	53.8	60.9	68.0	76.1	305.8
Total	**215.8**	**239.5**	**256.1**	**273.5**	**293.7**	**1,278.6**

Customers are forecast to achieve cumulative energy savings of approximately 1,279 GWh over the 2021 to 2025 period. Customers are also forecast to achieve a peak demand reduction of approximately 70 MW over this period.

[28] A 2019 survey conducted by Econoler, a provider of energy efficiency consulting services, showed that: (i) 5 of 6 organizations offer programs designed to address low-income residential markets; (ii) 4 of 6 organizations offer instant rebate programs; and (iii) 6 of 6 organizations offer a custom program for commercial and industrial customers. The 6 organizations included in the survey were FortisBC, Manitoba Hydro, Efficiency Nova Scotia, Efficiency Vermont, Efficiency Maine and BC Hydro.

Participating customers are forecast to realize electricity bill savings of approximately $185 million over the 2021 to 2025 period. All Newfoundland Power customers are forecast to benefit from lower system costs of approximately $107 million over this period.[29]

Costs to implement the Customer CDM Portfolio include: (i) general expenses for customer education and support, such as responding to customer enquiries; and (ii) program delivery costs, which include costs directly associated with customer programs and related research.[30]

Table 2 provides the estimated cost of implementing the Customer CDM Portfolio over the period 2021 to 2025.

Table 2
Newfoundland Power
Customer CDM Portfolio
Estimated Costs
2021-2025
($000s)

Cost Category	2021	2022	2023	2024	2025	Total
General	646	676	759	842	824	3,747
Program	6,530	7,170	7,006	6,305	6,560	33,571
Total	**7,176**	**7,846**	**7,765**	**7,147**	**7,384**	**37,318**

General costs associated with implementing the Customer CDM Portfolio are estimated at approximately $646,000 in 2021. Program costs are estimated at approximately $6.5 million in 2021. This is consistent with recent expenditure levels.[31]

[29] On a cumulative basis, customers are forecast to achieve electricity bill savings of approximately $304 million and lower system costs of approximately $244 million over the 2009 to 2025 period.

[30] Program costs include related research costs over $100,000. In addition to general planning and research, the Customer CDM Portfolio includes 2 research programs: (i) a Small Business Direct Install Pilot Program; and (ii) a Heat Pump Load Research Pilot Program. For more information, see Volume 2, 2021 Plan, Schedule K, pages 2 to 3.

[31] General costs for customer CDM averaged approximately $622,000 over the 2016 to 2020F period. CDM program costs averaged approximately $6.5 million over this period.

General costs will be expensed as incurred. Program costs will be recovered from customers through the existing CDM Cost Deferral Account, as approved by the Board in Order No. P.U. 13 (2013).

3.2.2 Economic Justification

All programs included in the Customer CDM Portfolio are evaluated to ensure their cost-effectiveness from both a customer and a utility perspective.

The cost-effectiveness of programs included in the Customer CDM Portfolio are evaluated using the Total Resource Cost ("TRC") test and the Program Administrator Cost ("PAC") test, as approved by the Board in Order No. P.U. 18 (2016).[32] For both the TRC and PAC tests, a program is cost-effective if it yields a result equal to or greater than 1.0.

[32] The TRC test evaluates programs from the perspective of the customer and the utility. It includes the costs and benefits experienced by the utility system, plus costs and benefits to program participants. The PAC test evaluates programs from the perspective of the utility. It includes the costs and benefits experienced by the utility system.

Table 3 provides the TRC and PAC test results for each program included in the Customer CDM Portfolio.

Table 3
Newfoundland Power
Customer CDM Programs
Economic Evaluation

Program	**TRC**	**PAC**
Insulation and Air Sealing	7.0	8.0
Thermostat	1.8	2.4
Heat Recovery Ventilator	1.6	1.9
Instant Rebates	1.7	2.7
Benchmarking	1.3	1.3
Low Income	3.3	2.7
Business Efficiency	2.8	4.6
Total Portfolio	**3.5**	**4.5**

The TRC and PAC test results are greater than 1.0 for each planned customer CDM program. All planned programs are therefore cost-effective from both a customer and a utility perspective.

On a total portfolio basis, the TRC and PAC test results are 3.5 and 4.5, respectively. The customer benefits of the total Customer CDM Portfolio are therefore more than triple the costs of implementation.

Use of the TRC and PAC tests to evaluate the cost-effectiveness of customer CDM programs remains current industry practice.[33]

[33] A survey of 7 Canadian jurisdictions shows that 4 jurisdictions use the TRC test (British Columbia, Ontario, Nova Scotia and Quebec) and 3 jurisdictions use the PAC test (Manitoba, Prince Edward Island and New Brunswick). See Volume 2, 2021 Plan, Schedule I, page 1.

3.3 Customer Electrification Portfolio

3.3.1 Planned Customer Portfolio

The Potential Study determined there is potential for cost-effective customer electrification programs, primarily through transportation electrification.[34]

The Customer Electrification Portfolio seeks to realize the customer benefits of electrification primarily through increasing the adoption of electric vehicles in the province. Planned programs include incentives for residential and commercial customers.[35] These incentives will reduce the upfront capital cost of purchasing an electric vehicle and associated charger.

The Customer Electrification Portfolio also includes a custom electrification program for commercial customers.[36] This program will provide individualized incentives to help commercial customers replace a range of fossil-fuel technologies with equivalent electric technologies.[37]

Industry research confirms Newfoundland Power's Customer Electrification Portfolio is consistent with current industry practice.[38]

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[34] See Volume 2, 2021 Plan, Section 3.1 Electrification, pages 5 to 8.

[35] For detailed descriptions of the residential and commercial incentive programs for electric vehicles and charging infrastructure, see Volume 2, 2021 Plan, Schedule F, pages 1 to 6.

[36] For a description of the custom electrification program, see Volume 2, 2021 Plan, Schedule F, pages 7 to 8.

[37] Examples of individualized projects include: (i) the installation of ductless mini-split heat pumps for water or space heating; (ii) the electrification of business processes; (iii) dockside electrification; and (iv) the purchase of electric forklifts.

[38] The Utilities researched 43 jurisdictions where utilities offer customer electrification programs. Of these 43 jurisdictions: (i) 32 jurisdictions provide incentives for electric vehicles or chargers; (ii) 31 jurisdictions invest in electric vehicle charging infrastructure; and (iii) 27 jurisdictions provide custom electrification solutions for commercial customers. See Volume 2, 2021 Plan, Schedule B.

Table 4 provides a forecast of annualized energy usage attributable to each program included in the Customer Electrification Portfolio over the period 2021 to 2025.

Table 4
Newfoundland Power
Customer Electrification Programs
Annualized Energy Usage
2021-2025
(GWh)

Program	2021	2022	2023	2024	2025	Total
Residential Electric Vehicle and Charger	0.3	1.5	4.3	9.3	17.1	32.5
Commercial Electric Vehicle and Charger	0.1	0.4	1.0	2.4	4.8	8.7
Custom Electrification (Commercial)	0.1	0.5	1.0	1.7	2.6	5.9
Total	**0.5**	**2.4**	**6.3**	**13.4**	**24.5**	**47.1**

Customer electrification is forecast to increase annualized energy usage by approximately 24.5 GWh by 2025. The Customer Electrification Portfolio is forecast to result in cumulative energy usage of approximately 47.1 GWh over the 2021 to 2025 period. Transportation electrification accounts for approximately 87% of forecast cumulative energy usage.[39]

The Customer Electrification Portfolio is also forecast to increase peak demand by 3.2 MW by 2025. This increase in peak demand is forecast to be offset by peak demand savings from customer CDM programs.[40]

Costs to implement the Customer Electrification Portfolio include: (i) general expenses for planning, customer education and support, such as responding to customer enquiries; and

[39] (32.5 + 8.7) / 47.1 = 0.87, or 87%.
[40] Customers are forecast to achieve a peak demand reduction of approximately 70 MW over this period.

(ii) program costs, which include costs directly associated with customer program delivery, related research[41] and customer support for electric vehicle infrastructure.[42]

Table 5 provides the estimated cost of implementing the Customer Electrification Portfolio over the period 2021 to 2025.

Table 5
Newfoundland Power
Customer Electrification Portfolio
Estimated Costs
2021-2025
($000s)

Cost Category	2021	2022	2023	2024	2025	Total
General	136	210	187	199	219	951
Program	1,336	3,014	3,944	4,494	4,385	17,173
Total	**1,472**	**3,224**	**4,131**	**4,693**	**4,604**	**18,124**

General costs associated with implementing the Customer Electrification Portfolio are estimated at approximately $136,000 in 2021. Program costs are estimated at approximately $1.3 million in 2021. Consistent with the Customer CDM Portfolio: (i) general costs for the Customer Electrification Portfolio in 2021 would be expensed as incurred; and (ii) program costs in 2021 are proposed to be recovered from customers by way of a deferral account, as explained in Section 4.0.

[41] Consistent with the Customer CDM Portfolio, program costs include research costs over $100,000. In addition to general planning and research, the Customer Electrification Portfolio includes 2 research programs: (i) a Custom Fleet Pilot Program; and (ii) an EV Demand Response Pilot Program. For more information, see Volume 2, 2021 Plan, Schedule K, pages 1 to 2.

[42] Customer support for electric vehicle infrastructure is provided through a make-ready model. The make-ready model includes the installation of electrical infrastructure to enable customers to purchase and install a fast charger (see Volume 2, 2021 Plan, pages 14 to 15).

Successful implementation of the Customer Electrification Portfolio will require capital investment in adequate public charging infrastructure for electric vehicles. Newfoundland Power's approach to investing in electric vehicle charging infrastructure is addressed in Section 5.0.

3.3.2 Economic Justification

The Application proposes the Board approve the use of a Modified Total Resource Cost ("mTRC") test to evaluate the cost-effectiveness of programs included in the Customer Electrification Portfolio.

The mTRC test is conceptually similar to the TRC test, but includes non-electrical benefits. For example, the mTRC test includes the customer benefits of lower fuel and maintenance costs associated with owning an electric vehicle. These non-electrical benefits are essential to the customer economics of electrification. Consistent with the TRC test, a result of 1.0 or greater indicates that a program is cost-effective from both a customer and a utility perspective.

Table 6 provides the mTRC test result for each customer program included in the Customer Electrification Portfolio.

Table 6
Newfoundland Power
Customer Electrification Programs
Economic Evaluation

Program	**mTRC**
Residential Electric Vehicle and Charger	2.0
Commercial Electric Vehicle and Charger	2.3
Custom Electrification (Commercial)	2.1
Total Portfolio	**2.0**

The mTRC test results are greater than 1.0 for each planned customer electrification program. All planned programs are therefore cost-effective from both a customer and a utility perspective.

On a total portfolio basis, the mTRC result is 2.0. The customer benefits of the complete Customer Electrification Portfolio are therefore double the costs of implementation.

Use of the mTRC test to evaluate the cost-effectiveness of customer electrification programs is consistent with current industry practice. A survey of North American practice confirmed that utilities that conduct cost-effectiveness testing of electrification programs do so by way of an overall cost assessment. These overall cost assessments consider non-electrical or other societal benefits, and are conceptually similar to the mTRC test.[43]

Newfoundland Power also assessed the rate mitigating benefit of the Customer Electrification Portfolio through a Net Present Value ("NPV") analysis. The NPV analysis assessed the net revenue impact of increased energy sales through customer electrification to 2034.[44] The net revenue impact was then divided by projected Company energy sales, including energy sales from electrification, to determine an indicative customer rate impact.

[43] The survey showed 7 jurisdictions undertake cost-effectiveness testing for electrification programs, all of which include an overall cost assessment. For information on the economic evaluations completed in other jurisdictions, see Volume 2, 2021 Plan, Schedule I, page 3.

[44] The NPV analysis included program costs and capital investments in infrastructure. Net revenue was calculated as: (i) the incremental revenue from increased electricity sales through customer electrification; less (ii) incremental system costs and the recovery of capital, program and research costs related to customer electrification. See Exhibit 2, Appendix A for a copy of the NPV analysis.

The Customer Electrification Portfolio will provide additional net revenue of approximately $123 million over the period 2021 to 2034. On an NPV basis, this equates to approximately $62 million in additional net revenue over this period.[45]

Increased net revenue will provide a rate mitigating benefit for customers over the long term. For example, increased net revenue through electrification will provide a rate mitigating benefit for customers of approximately 0.5¢/kWh by 2034.[46] This equates to $100 in reduced electricity charges that year for an average residential customer with electric heating.[47]

The rate mitigating benefit of the Customer Electrification Portfolio is consistent with the least-cost delivery of reliable service to customers.

4.0 ELECTRIFICATION COST RECOVERY FOR 2021

4.1 2021 Electrification Program Costs

The Application proposes the Board approve an Electrification Cost Deferral Account. The proposed account will provide for the deferred recovery of program costs associated with implementing the Customer Electrification Portfolio in 2021.

The Electrification Cost Deferral Account is proposed to operate in a manner similar to the existing CDM Cost Deferral Account.

[45] See Exhibit 2, Appendix A, Column H.

[46] The customer rate impact of 0.5 cents/kWh was determined by dividing the net revenue impact of $33.9 million in 2034 by the projected Company energy sales, including energy sales from electrification, of 6,527 GWh.

[47] The average annual usage of an all-electric residential customer was 17,412 kWh in 2019 ((17,412 kWh x 0.5¢/kWh) * 1.15 HST = $100).

The proposed account will include:

(i) Costs incurred for detailed program development, including promotional materials, advertising, pre and post customer installation checks, incentives, processing applications and incentives, training of employees and trade allies, program evaluation costs;

(ii) Costs to operate Company-owned charging stations; and

(iii) Costs for major studies such as pilot programs, comprehensive customer surveys and potential studies that are greater than $100,000.

The proposed account will exclude:

(i) Expenditures that are properly chargeable to a plant account; and

(ii) Costs 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 proposed account will be credited with the receipt of government funding related to electrification programs[48] and revenues associated with the operation of Company-owned charging stations.[49]

[48] Newfoundland Power applies for government funding for electrification programs and infrastructure, when available, to reduce overall costs borne by customers. Program-related funding would reduce costs to customers by way of a credit to the Electrification Cost Deferral Account. Infrastructure-related funding would reduce costs to customers by way of a contribution in aid of the capital expenditure.

[49] In 2021, Newfoundland Power plans to charge a rate of $15.00 per hour for the use of fast chargers. This rate is consistent with the rate indicated by Newfoundland and Labrador Hydro in its *Application for the Provision of Electric Vehicle Charging Services* (see response to Request for Information NP-NLH-001).

Transfers to and from the proposed account will be tax effected.[50] Accordingly, the 2021 transfer to the proposed account will reflect the net after tax impact of the 2021 implementation costs to Newfoundland Power in the deferral account balance for year-end 2021.

Table 7 provides Newfoundland Power's estimated 2021 net cost deferral resulting from implementation of the Customer Electrification Portfolio.

Table 7
Newfoundland Power
2021 Customer Electrification Portfolio
Estimated Net Cost Deferral
(000s)

Program Costs	$1,336
Income Tax Effects[51]	($401)
Net Deferral	**$935**

The disposition of any balance in this account would be subject to a future order of the Board.

4.2 Justification for Proposed Deferral Account

Implementation of the Customer Electrification Portfolio in 2021 is consistent with: (i) the Board's recommendation as part of the *Reference on Rate Mitigation Options and Impacts*; (ii) sound public utility practice; and (iii) the least-cost delivery of reliable service to customers.

[50] Actual 2021 costs associated with implementing the Customer Electrification Portfolio will be deductible for income tax purposes for the 2021 tax year.
[51] Reflects a 2021 marginal income tax rate of 30%.

As the Customer Electrification Portfolio was not conceived at the time of Newfoundland Power's last general rate application, costs associated with implementation were not reasonably determinable at that time. Accordingly, these costs are not included in current customer rates.

Deferred cost recovery will enable the earliest feasible realization of the rate mitigating benefits of the Customer Electrification Portfolio. A general rate application to consider cost recovery is an alternative to deferred cost recovery. However, this alternative would be expected to delay implementation of the Customer Electrification Portfolio until at least 2022.[52]

The costs of effective utility electrification programs, which are consistent with the provision of least-cost service delivery, should be recoverable by the utility. Permitting the deferred recovery of electrification program costs is consistent with the Board's 2009 approval of deferred recovery of CDM program costs.

Exhibit 1 to the Application provides the proposed definition for the Electrification Cost Deferral Account.

5.0 ELECTRIFICATION CAPITAL EXPENDITURES FOR 2021

5.1 2021 Capital Expenditures

Newfoundland Power plans to construct a network of electric vehicle charging stations throughout its service territory (the "Electric Vehicle Charging Network"). The network will

[52] Order No. P.U. 2 (2019) requires Newfoundland Power's next general rate application to be filed by June 1, 2021. In accordance with past practice, consideration of that application would be expected to require several months. For example, Newfoundland Power's *2019/2020 General Rate Application* was filed on June 1, 2018. The resulting Board order was issued on January 24, 2019.

include 28 charging sites, each with a fast charger. Investment in fast chargers is consistent with current utility practice.[53]

The total estimated cost of constructing the Electric Vehicle Charging Network is approximately $4.3 million over 5 years. The Application proposes the Board approve approximately $1.5 million for the construction of 10 charging sites for the Electric Vehicle Charging Network in 2021.

Newfoundland Power has applied for approximately $550,000 in federal funding for this project in 2021. If approved, the federal funding will reduce the overall capital costs borne by customers.

[53] A survey in 2020 showed that utility investment in electric vehicle charging infrastructure is common practice. Of 43 jurisdictions surveyed, 31 jurisdictions invest in charging infrastructure. Of these, approximately 77% specifically invest in fast chargers. See Volume 2, 2021 Plan, Schedule B.

Table 8 provides a breakdown of the proposed capital expenditures for 2021.[54]

Table 8
Newfoundland Power
Electric Vehicle Charging Network
2021 Capital Expenditures

Cost Category	**($000s)**
Material	1,400
Labour – Internal	-
Labour – Contract	-
Engineering	38
Other	100
Total	**1,538**

The budget estimate for this project is based on an assessment of materials costs incurred by other utilities and Newfoundland Power's specific requirements.[55]

Capital expenditures for subsequent years will be brought forward for approval as part of Newfoundland Power's annual capital budget applications.

[54] The Electric Vehicle Charging Network project is classified as a Distribution expenditure. If approved, a new distribution plant account would be added to *Section 4 Plant Accounts* of Newfoundland Power's *System of Accounts* to include the regulated value of electric vehicle charging stations. The addition would occur in the Company's next annual filing of its *System of Accounts*, which is required to be filed with the Board by March 31, 2021. In accordance with the Board's *Capital Budget Application Guidelines*, the project is classified as a Justifiable project.

[55] The assessment included, as examples, costs incurred by Newfoundland and Labrador Hydro, FortisBC, Avista, and Hawaiian Electric Company, as well as industry research from NYSERDA and the Rocky Mountain Institute. The assessment showed the typical cost of purchasing a fast charger is $50,000. The total installed cost for Canadian utilities ranges from approximately $125,000 to $160,000. Newfoundland Power's project estimate is within this range, at approximately $150,000 per fast charger.

5.2 Justification for Proposed Capital Expenditures

Realizing the rate mitigating benefits of the Customer Electrification Portfolio requires investment in adequate public charging infrastructure for electric vehicles.

Market research showed the single largest factor influencing the adoption of electric vehicles is access to fast charging infrastructure.[56] Access to fast charging infrastructure is limited in Newfoundland and Labrador[57] and lags behind that of other Canadian provinces.[58] Private sector investment in fast charging infrastructure is currently constrained by a weak business case.[59]

Construction of the Electric Vehicle Charging Network will enable the successful delivery of the Customer Electrification Portfolio and associated rate mitigating benefits for customers. This capital project is therefore consistent with the least-cost delivery of reliable service to customers and should not be deferred.

Exhibit 2 to the Application provides a detailed report on Newfoundland Power's planned Electric Vehicle Charging Network, including the capital expenditures proposed for 2021.

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[56] A 2019 survey completed by MQO showed that Newfoundland and Labrador residents ranked access to charging and concerns about reliability of range among the highest barriers to EV ownership.

[57] Newfoundland and Labrador Hydro is currently installing 14 fast chargers in the province. These will be the first public fast chargers installed in Newfoundland and Labrador.

[58] According to Natural Resources Canada, there are currently over 5,400 electric vehicle charging stations across Canada. The majority of public charging stations are concentrated in Quebec (47%), Ontario (25%) and British Columbia (17%). Newfoundland and Labrador ranks last, with 0.4% of total charging stations in Canada.

[59] The Potential Study states: *"The current lack of a solid business case for DCFC charging stations for third-party market actors suggests that DCFC deployment in the province will be limited in the absence of utility or government intervention."* See Volume 2, 2021 Plan, Schedule C, page 111.

Newfoundland Power Inc.

Electrification Cost Deferral Account

Proposed Definition

Electrification Cost Deferral Account

This account shall be charged with the costs incurred by Newfoundland Power in implementing electrification initiatives.

These 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 pilots, 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 initiatives and any revenues associated with the operation of Company-owned charging stations.

The account will exclude any expenditure properly chargeable to plant accounts. The account shall also exclude electrification expenditures that are general in nature and not associated with a specific electrification initiative, such as costs associated with providing electrification awareness, planning, research and general supervision costs.

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

The disposition of any balance in this account will be subject to a future order of the Board.

2021 Supplemental Capital Expenditures

Electric Vehicle Charging Network

December 2020

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Approved by:
Lorne Henderson, P.Eng.

Table of Contents

1.0 Introduction

Newfoundland Power Inc. ("Newfoundland Power" or "the Company") plans to construct a network of electric vehicle charging sites throughout its service territory (the "Electric Vehicle Charging Network").

Construction of the Electric Vehicle Charging Network is necessary to enable the successful delivery of new customer electrification programs commencing in 2021. The successful delivery of electrification programs will provide rate mitigating benefits for customers over the long term.

The Electric Vehicle Charging Network will be constructed over 5 years at a total capital cost of approximately $4.3 million. This includes approximately $1.5 million for the installation of 10 electric vehicle charging sites in 2021.

2.0 Background

2.1 Electrification, Conservation and Demand Management Plan: 2021-2025

Newfoundland Power and Newfoundland and Labrador Hydro (the "Utilities") have jointly delivered customer conservation and demand management ("CDM") programs under multi-year plans since 2009. Delivery of these programs has reduced overall costs to customers.[1]

In its final report on the *Reference on Rate Mitigation Options and Impacts*, the Newfoundland and Labrador Board of Commissioners of Public Utilities (the "Board") recommended that the Utilities and Provincial Government work together to develop a comprehensive and coordinated approach on the most appropriate CDM and electrification programs for the province.[2]

The Utilities, in consultation with the Provincial Government, have developed a new plan to guide customer programming over the next 5 years. The *Electrification, Conservation and Demand Management Plan: 2021-2025* (the "2021 Plan") continues longstanding customer CDM programs and introduces customer electrification programs for the first time.[3]

The 2021 Plan was developed based on a market potential study (the "Potential Study").[4] The Potential Study applied Newfoundland and Labrador-specific inputs to assess CDM and electrification potential in the province, including corresponding opportunities and challenges. Economic screening was then conducted to ensure the development of programs that are cost-effective for customers and the Utilities.[5]

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1 Over 60,000 Newfoundland Power customers have participated in the Company's CDM programs since 2009. These customers are forecast to save approximately $118 million on their electricity bills by 2020. System costs are forecast to be reduced by approximately $137 million by 2020 as a result of these programs.

2 See *Rate Mitigation Options and Impacts: Muskrat Falls Project – Final Report*, February 7, 2020, page ii.

3 The 2021 Plan is provided in Volume 2, Supporting Materials.

4 The Potential Study was conducted by Dunsky Energy Consulting. The primary outcomes of the Potential Study were the identification of: (i) cost-effective electrification and CDM measures; (ii) general parameters for program development; and (iii) energy savings and electrification potential by sector and end-use. For the Potential Study, see Volume 2, 2021 Plan, Schedule C.

5 For information on the economic evaluation of programs, see Volume 2, 2021 Plan, Section 4.1 and Schedule I.

Overall, the CDM and electrification programs outlined in the 2021 Plan will result in lower customer costs, lower system costs, and rate mitigating benefits for customers.[6]

2.2 Customer Benefits of Electrification

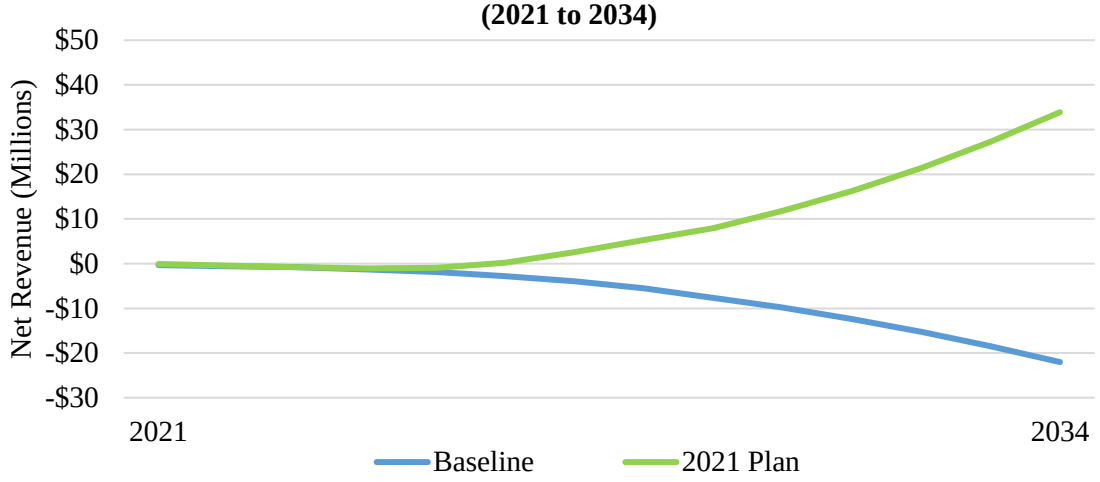
Electrification will provide rate mitigating benefits for customers.

Newfoundland and Labrador will have surplus electricity available following commissioning of the Muskrat Falls Project.[7] The Board determined that maximizing domestic load through electrification, improving energy efficiency and using demand response to reduce system peak and allow for increased export sales would lead to the best outcomes for customers.[8]

The rate mitigating benefit of customer electrification was assessed through a Net Present Value ("NPV") analysis.[9] The NPV analysis assessed the net revenue impact of increased energy sales through customer electrification to 2034.[10] The net revenue impact was then divided by projected Company energy sales to determine an indicative customer rate impact.

Figure 1 shows the rate mitigating benefit of electrification from 2021 to 2034 under baseline conditions (i.e. without utility intervention) and with implementation of the 2021 Plan.[11]

Figure 1
Rate Mitigating Benefit of Electrification
(2021 to 2034)



6 For a discussion of customer benefits, see Volume 2, 2021 Plan, Section 5.0.

7 Following commissioning of the Muskrat Falls Project, the quantity of electricity generated in the province is forecast to exceed domestic requirements for electricity, resulting in a surplus of approximately 3.5 TWh.

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

9 Appendix A to this report provides the NPV analysis.

10 Net revenue reflects: (i) the incremental revenue from increased electricity sales through customer electrification; less (ii) incremental system costs and the recovery of capital, program and research costs related to customer electrification.

11 The baseline reflected in Figure 1 was developed using the Potential Study analysis and assumes no additional utility intervention in electrification. The baseline shows an overall increase in costs to customers due to capacity-related system costs resulting from the unmanaged charging of electric vehicles. See Volume 2, 2021 Plan, pages 11 to 12, and page 27, Figure 6.

The electrification programs outlined in the 2021 Plan will provide additional net revenue of approximately $123 million over the period 2021 to 2034. On an NPV basis, this equates to approximately $62 million in additional net revenue over this period.

Increased net revenue will provide a rate mitigating benefit for customers over the longer term. For example, increased net revenue through electrification is forecast to provide a rate mitigating benefit for customers of 0.5¢/kWh by 2034.[12] This equates to $100 in reduced electricity charges that year for an average residential customer with electric heating.[13]

Achieving this rate mitigating benefit for customers will require electrification of the province's transportation sector through the increased adoption of electric vehicles.[14]

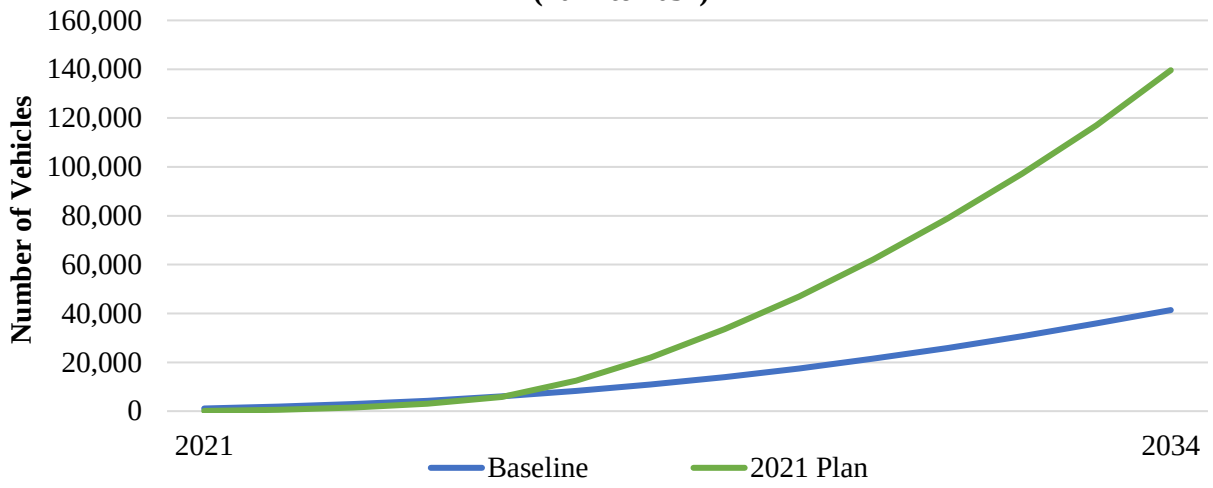
2.3 Customer Electrification

The 2021 Plan seeks to increase the adoption of electric vehicles in the province.

Electric vehicle adoption in Newfoundland and Labrador currently lags behind that of other Canadian provinces.[15] Considerable potential exists to increase the adoption of electric vehicles in the province.

Figure 2 provides a forecast of electric vehicle adoption in the province under baseline conditions (i.e. without utility intervention) and with implementation of the 2021 Plan.

Figure 2
Electric Vehicle Adoption in Newfoundland and Labrador
(2021 to 2034)



[12] The customer rate impact of 0.5¢/kWh was determined by dividing the net revenue impact of $33.9 million in 2034 by the projected Company energy sales, including energy sales from electrification, of 6,527 GWh.

[13] The average annual usage of an all-electric residential customer was 17,412 kWh in 2019 ((17,412 kWh x 0.5¢/kWh) * 1.15 HST = $100).

[14] The Potential Study showed significant potential for transportation electrification in Newfoundland and Labrador, with limited potential for electrification of other end uses. See Volume 2, 2021 Plan, pages 5 to 8.

[15] For example, electric vehicles account for approximately 10% of total annual vehicle sales in British Columbia and 7% in Quebec (see Volume 2, 2021 Plan, Schedule D, page 5). This compares to less than 0.1% of total annual vehicle sales in Newfoundland and Labrador.

The 2021 Plan is forecast to more than triple the number of electric vehicles on the province's roads by 2034.

Without utility intervention, there are forecast to be approximately 41,000 electric vehicles in Newfoundland and Labrador by 2034. This is forecast to increase to approximately 140,000 electric vehicles in the province following implementation of the 2021 Plan.

The Potential Study showed the single largest factor influencing the adoption of electric vehicles is access to fast charging infrastructure.[16] Direct Current Fast Chargers ("DCFC"), commonly referred to as Level 3 or fast chargers, charge an electric vehicle in approximately 30 minutes to one hour. This compares to, for example, an average of 9 hours for a Level 2 charger.[17]

Access to fast charging infrastructure is limited in Newfoundland and Labrador[18] and lags behind that of other Canadian provinces.[19] Private sector investment in fast charging infrastructure is currently constrained by a weak business case. Without investment in adequate charging infrastructure, customers' adoption of electric vehicles will be limited.[20]

The 2021 Plan includes utility investment in fast charging infrastructure. This investment will enable the successful delivery of electrification programs, including associated rate mitigating benefits for customers.

A survey in 2020 showed that utility investment in electric vehicle charging infrastructure is common practice. Of 43 jurisdictions surveyed, 31 jurisdictions invest in charging infrastructure. Of these, approximately 77% specifically invest in fast chargers.[21]

Section 3.0 details Newfoundland Power's multi-year approach to constructing an Electric Vehicle Charging Network in its service territory.

Section 4.0 outlines the specific capital project proposed for 2021.

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16 The Potential Study states: *"The current lack of a solid business case for DCFC charging stations for third-party market actors suggests that DCFC deployment in the province will be limited in the absence of utility or government intervention."* See Volume 2, 2021 Plan, Schedule C, page 111.

17 For a detailed description of electric vehicles and charging infrastructure, see Volume 2, 2021 Plan, Schedule D.

18 Newfoundland and Labrador Hydro is currently installing 14 fast chargers in the province. These will be the first public fast chargers installed in Newfoundland and Labrador.

19 According to Natural Resources Canada, there are currently over 5,400 electric vehicle charging stations across Canada. The majority of public charging stations are concentrated in Quebec (47%), Ontario (25%) and British Columbia (17%). Newfoundland and Labrador ranks last, with 0.4% of total charging stations in Canada.

20 In a 2019 survey completed by MQO, Newfoundland and Labrador residents ranked access to charging and concerns about reliability of range among the highest barriers to electric vehicle ownership.

21 A total of 24 surveyed jurisdictions invest in fast chargers, or DCFC (24 / 31 = 0.77, or 77%). See Volume 2, 2021 Plan, Schedule B.

3.0 Electric Vehicle Charging Network

3.1 Capital Investment

Newfoundland Power's Electric Vehicle Charging Network will enable electrification of the province's transportation sector.

Table 1 provides the number of charging sites to be constructed annually as part of Newfoundland Power's Electric Vehicle Charging Network.

Table 1:
Electric Vehicle Charging Network Sites
(2021 to 2025)

2021	2022	2023	2024	2025	Total
10	10	3	3	2	28

Newfoundland Power's Electric Vehicle Charging Network will include 28 charging sites throughout its service territory by 2025. Each site will measure approximately 10x10 metres and include a fast charger.

The number of charging sites constructed is highest in the early years. This will address a primary barrier to electric vehicle adoption in the early stages of implementing the 2021 Plan. Addressing this barrier early in plan implementation will permit the earliest feasible achievement of the customer rate mitigating benefits of electrification.

Table 2 provides the annual capital cost of constructing Newfoundland Power's Electric Vehicle Charging Network.

Table 2:
Electric Vehicle Charging Network Capital Costs
$000s
(2021 to 2025)

2021	2022	2023	2024	2025	Total
$1,538	$1,530	$460	$460	$311	$4,299

The total capital cost of constructing the Electric Vehicle Charging Network is approximately $4.3 million over 5 years.

Newfoundland Power has applied for $550,000 in federal funding for the construction of the Electric Vehicle Charging Network in 2021. If approved, this funding will reduce the overall capital costs borne by customers.[22] The Company plans to pursue additional third-party funding opportunities to reduce customer costs in future years, when available.

3.2 Operation and Maintenance

Newfoundland Power will own and operate the Electric Vehicle Charging Network. Annual operating and maintenance requirements associated with electric vehicle charging stations typically include: (i) replacing air filters; (ii) rechecking torque on connectors; and (iii) inspecting and cleaning charging cables, the kiosk and civil works.

Site hosts will be required to sign a 10-year land lease agreement with Newfoundland Power. The site host will be responsible for general upkeep of the parking spaces and surrounding area. This can include grass cutting, general landscaping, snow clearing, and painting the parking spaces. Site hosts will be selected through a public application process.

The charging stations will be networked via an internet connection. This networking will provide customers with information on the availability of charging stations and support all associated transactions (e.g. customer payments). It will also enable Newfoundland Power to study electric vehicle charging patterns. This information will inform future public charging infrastructure requirements.

Network management services will be provided by a third party. The third party will provide: (i) customer support services for those using the charging stations; and (ii) technical support for diagnosing and remedying any breakdowns or malfunctions of the chargers. Third-party network management services are standard industry practice.[23]

Newfoundland Power's planned customer rates for fast chargers are consistent with the rates charged by Newfoundland and Labrador Hydro.[24]

Revenues from charging stations, net of network management fees, will be remitted back to Newfoundland Power to offset the Company's annual cost of operating and maintaining the Electric Vehicle Charging Network.[25]

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[22] The Utilities have applied for approximately $1 million in funding to install 19 charging sites throughout the province. Newfoundland Power's allocation of the funding would be approximately $550,000. This funding is not reflected in the NPV analysis provided as Appendix A to this report.

[23] As examples, Newfoundland and Labrador Hydro, Nova Scotia Power, FortisBC and BC Hydro use third-party network management services for electric vehicle charging sites.

[24] In 2021, Newfoundland Power plans to charge a rate of $15.00 per hour for the use of fast chargers. This rate is consistent with the rate indicated by Newfoundland and Labrador Hydro in its *Application for the Provision of Electric Vehicle Charging Services* (response to Request for Information NP-NLH-001).

[25] Newfoundland Power estimates the annual operating and maintenance cost to be approximately $5,000 per charging site.

4.0 2021 Project

4.1 2021 Project Description

The construction of Newfoundland Power's Electric Vehicle Charging Network is proposed to commence in 2021 with the construction of 10 charging sites.

For 2021, each site will include: (i) a 50 kW fast charger; and (ii) a 7 kW Level 2 charger. Level 2 chargers will provide overflow capacity when fast chargers are in use. The plan to install Level 2 chargers is contingent upon approval of federal funding for 2021.[26]

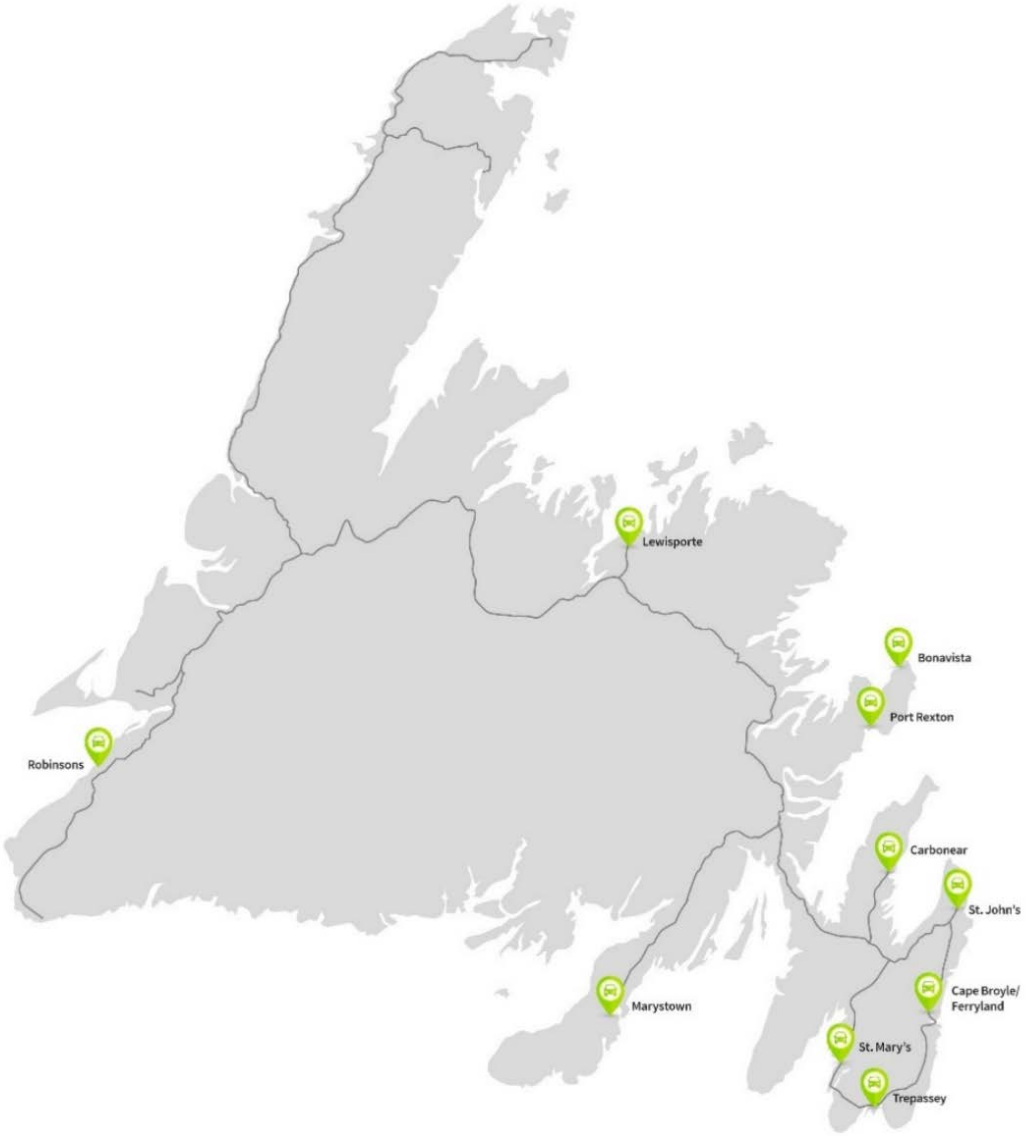
The locations of charging sites in 2021 were selected based on specific criteria. These criteria include: (i) location along highways and major transportation routes; (ii) the location of current and planned charging sites; and (iii) the optimal distance between charging sites. These criteria are consistent with Federal Government recommendations.[27]

[26] The incremental cost of co-locating a Level 2 charger with a fast charger is approximately $5,000 per site, or $50,000 for the 10 sites planned for 2021. Newfoundland Power has applied for $50,000 in federal funding to co-locate Level 2 chargers with fast chargers in 2021. Proceeding with the co-location of Level 2 chargers in 2021 is contingent upon federal funding. Should federal funding not be approved, the customer benefits of electrification as outlined in this report would continue to be realized through the installation of fast chargers as part of the Electric Vehicle Charging Network.

[27] See Natural Resources Canada's *Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative Request for Project Proposals Applicant's Guide*, Office of Energy Efficiency, March 2020.

Figure 3 provides the locations selected for electric vehicle charging sites in 2021.

Figure 3:
2021 Electric Vehicle Charging Site Locations



The locations selected for electric vehicle charging sites in 2021 are: St. John's, Cape Broyle/Ferryland, Trepassey, St. Mary's, Carbonear, Marystown, Port Rexton, Bonavista, Lewisporte and Robinsons. The specific sites for each location will be selected through a public application process.

4.2 2021 Project Cost

The total cost of constructing the first 10 sites for Newfoundland Power's Electric Vehicle Charging Network in 2021 is approximately $1.5 million.

Table 3 provides a breakdown of the total 2021 project cost.[28]

Table 3:
2021 Project Costs

Cost Category	**($000s)**
Material	$1,400
Labour – Internal	-
Labour – Contract	-
Engineering	38
Other	100
Total	**$1,538**

Project costs include the engineering, equipment, and construction of 10 sites that include a fast charger and co-located Level 2 charger. If approved, federal funding will reduce the overall capital costs borne by customers.

The 2021 Plan was not finalized at the time of filing the Company's *2021 Capital Budget Application.* These costs were therefore not included in that application.

Costs to construct the remaining 18 sites for Newfoundland Power's Electric Vehicle Charging Network will be brought forward for approval in future annual capital budget applications.

5.0 Conclusion

The 2021 Plan is consistent with the Board's recommendation for a comprehensive and coordinated approach to delivering appropriate customer programs.

An NPV analysis determined the delivery of electrification programs under the 2021 Plan will provide rate mitigating benefits to customers over the long term. Achieving these benefits will require electrification of the province's transportation sector. Electrification of Newfoundland and Labrador's transportation sector requires investment in fast charging infrastructure.

Newfoundland Power's proposed investment in electric vehicle charging infrastructure is consistent with current utility practice and the least-cost delivery of reliable service to customers.

[28] Tables 2 and 3 do not include costs associated with connecting a charging site to the distribution system. Similar to the connection of new customers, these costs will be incurred under the *Extensions*, *Services*, *Transformers* and *Meters* capital projects. These costs are reflected in the NPV analysis under System Costs (see Column D).

Appendix A
Net Present Value Analysis

Newfoundland Power Inc.
Pro Forma Revenue Requirement Analysis
2021 to 2034
($000s)

	Investment		Pro Forma Revenue Requirement Impacts					
Year	Capital Costs A	Program Costs B	Incremental Revenues C	Incremental System Costs D	Capital Cost Recovery E	Program Cost Recovery F	Net Revenues G	Cumulative NPV H
2021	1,538	1,336	49	32	115	35	(133)	(126)
2022	1,530	3,014	283	183	340	278	(519)	(589)
2023	460	3,944	772	447	477	746	(899)	(1,348)
2024	460	4,494	1,676	953	530	1,328	(1,135)	(2,253)
2025	311	4,385	3,414	1,927	570	1,954	(1,037)	(3,035)
2026	0	1,074	7,399	4,248	571	2,456	123	(2,947)
2027	0	1,706	13,142	7,563	548	2,544	2,487	(1,272)
2028	0	2,364	20,604	12,155	525	2,721	5,202	2,039
2029	0	2,980	29,583	18,175	502	2,987	7,919	6,803
2030	0	3,651	40,373	24,813	480	3,333	11,747	13,481
2031	0	4,334	52,825	32,481	382	3,765	16,197	22,184
2032	0	5,061	67,050	41,259	214	4,151	21,425	33,063
2033	0	5,788	82,948	51,091	107	4,467	27,284	46,157
2034	0	6,613	101,001	62,258	56	4,792	33,894	61,529

Notes

A Includes all Newfoundland Power electric vehicle charging infrastructure costs as described in *Exhibit 2, Electric Vehicle Charging Network.*

B Includes all program and research costs associated with Newfoundland Power's electrification initiatives, including operation of the Company's electric vehicle charging sites.

C Projected incremental revenues from additional energy sales as a result of the electrification initiatives set out in the 2021 Plan. The revenue figures are based on a change from the rates approved by the Board in Order No. P.U. 31 (2019) Amended and annual increases in electricity rates of 2.25%.

D Projected incremental system costs (energy and capacity costs) as a result of the electrification initiatives set out in the 2021 Plan. The system cost figures primarily reflect the marginal cost information received from Newfoundland and Labrador Hydro in April 2020.

E Includes forecast depreciation, financing costs and associated income taxes related to the electric vehicle charging infrastructure investment. Based on an estimated 10 year service life, the Company's incremental weighted average cost of capital ("WACC") of 5.81% and an income tax rate of 30%.

F Includes forecast amortization, financing costs and associated income taxes related to electrification program costs. Based on an estimated amortization period of 10 years (equal to the estimated life of an electric vehicle), the Company's incremental WACC of 5.81% and an income tax rate of 30%.

G Calculated as C - D - E - F.

H The net present value ("NPV") as of the end of each period using the Company's incremental WACC of 5.81%.