NEWFOUNDLAND POWER INC.

Load Research and Rate Design Update

March 31, 2025

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1.0 INTRODUCTION

On December 30, 2022, Newfoundland Power Inc. ("Newfoundland Power" or the "Company") filed its *Load Research and Rate Design Framework* (the "Framework") in accordance with Order No. P.U. 3 (2022). Newfoundland Power's *Load Research and Rate Design Update – March 28, 2024* was provided to the Board as part of the Company's 2023 Annual Return.[1]

In Order No. P.U. 3(2025) in relation to Newfoundland Power's *2025/2026 General Rate Application*, the Board requested Newfoundland Power to provide updates every six months on the status of its Load Research Study and Rate Design Review, on or before April 1, as part of its annual return and also on September 30 each year.[2]

The *Load Research and Rate Design Update – March 31, 2025* provides an update to Newfoundland Power's load research and rate design activities and plans since the *Load Research and Rate Design Update – March 28, 2024* was provided to the Board.

2.0 BACKGROUND

Periodic reviews of Newfoundland Power's rate designs are necessary to ensure the Company's rate designs are consistent with good rate making principles and consider utility cost dynamics. Customer load research is periodically required to ensure the appropriate allocation of costs to Newfoundland Power's customer rate classes.

A review of Newfoundland Power's rate designs is timely considering changes to supply cost dynamics resulting from the integration of the Muskrat Falls Project into the provincial electrical system. On May 16, 2024, the Provincial Government announced the finalization of its Rate Mitigation Plan. This provides greater clarity in the near term in relation to customer rate increases associated with the Muskrat Falls Project and Newfoundland and Labrador Hydro ("Hydro") until 2030.[3] In Order No. P.U. 1 (2025), and in accordance with a settlement agreement in relation to Newfoundland Power's *2025/2026 General Rate Application*, Hydro's Utility rate to Newfoundland Power was revised to ensure that energy charges from Hydro to Newfoundland Power more closely reflect Hydro's marginal cost of energy and to mitigate customer rate volatility.[4]

Customer load research during this period also provides updated customer load profiles and data that are necessary to evaluate current customer end use activities and cost recovery within Newfoundland Power's various rate classes.

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1 The *Load Research and Rate Design Update – March 28, 2024* was provided to the Board in accordance with the Board's January 23, 2023 letter *Re: Newfoundland Power Inc. – Load Research and Rate Design Framework Request for Annual Updates*.

2 See Order No. P.U. 3 (2025), page 58, lines 30-32.

3 See Government of Newfoundland and Labrador News release *Provincial Government Announces Finalization of Rate Mitigation Plan*, May 16, 2024.

4 See Order No. P.U. 1 (2025).

3.0 LOAD RESEARCH

Load research data is used to assess the reasonableness of cost recovery from each customer rate class. The information gathered is used to determine the portion of system demand costs that should be recovered from each customer class. Load research data provides estimates of class demand on the system at specific times.

The Island Interconnected System is a winter peaking system. Customer demand requirements are approximately twice as high in winter months than in summer months. Generation and transmission demand costs are allocated by customer classes in the cost of service study based on each customer classes' contribution to the winter system peak (i.e., based on coincident peak).[5] Distribution demand costs are allocated based on the relative size of the class peak demands (i.e., based on non-coincident peak).

3.1 Load Research Study Update

Newfoundland Power completed a number of milestones related to its Load Research Study in 2024. These included: (i) meter procurement; (ii) completion of field testing of load research meters and integration into Newfoundland Power's metering and billing systems; (iii) completion of customer recruitment activities; and (iv) installation of meters on the customer premises.

Meter Procurement

Newfoundland Power ordered the load research meters in September 2023 following feedback from the Consumer Advocate, Hydro, and the Board (together, the "Parties") in relation to the DNV *Load Research Study Plan*.[6] Newfoundland Power received a small quantity of load research meters in early 2024 to facilitate field testing and meter integration. The remainder of the load research meters necessary to facilitate the Load Research Study were received by Newfoundland Power starting in September 2024.[7]

Meter Integration and Field Testing

Collection of customer load research data requires integrating new load research meters into the Company's existing metering and billing systems. It also involves establishing a secure network protocol to allow the load research consultant, DNV, to securely access the customer load data on a routine basis. This is to ensure accurate collection of customer load data with minimal impact on customers.

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5 This is referred to as the single coincident peak method (1 CP). For the purposes of the Load Research Study, the system peak is based on the time of Hydro's system peak because the majority of Newfoundland Power's generation and transmission demand costs are related to Hydro's assets.

6 DNV completed its *Load Research Study Plan* on June 15, 2023. The *Load Research Study Plan* was circulated to the Parties on June 16, 2023. The load research meters were ordered once feedback from the Parties was received and incorporated into the *Load Research Study Plan* in August 2023.

7 Delivery of the full order of load research meters took approximately 12 months due to supply chain constraints and associated delays.

In 2024, Newfoundland Power successfully integrated the new load research meters with its existing metering system and Customer Care & Billing System ("CC&B").[8] The integration involved collaboration between the Company's technology, metering, and customer service teams, in addition to the Company's Rates and Cost Specialist and DNV. The integration of the new load research meters was successfully field tested to validate the load research technology prior to the widespread installation of the load research meters throughout the Company's service territory.

Customer Recruitment

The *Load Research Study Plan* included the development of a sample of customers in Newfoundland Power's Domestic and General Service rate classes that would provide the appropriate level of precision from which to base conclusions.[9] Based on feedback from the Parties, the size of the Residential sample was increased to accommodate residential customers with electric vehicles and with heat pumps and/or electric furnaces.

Each customer selected to participate in the Load Research Study was contacted by mail, email and a phone call when necessary. To prepare for any customer inquiries, Newfoundland Power conducted training with its customer service representatives. In addition, the Company developed a series of frequently asked questions ("FAQs") that would assist the customer service representative in responding to any customer questions.

Newfoundland Power utilized a customer opt-out approach in its customer recruitment strategy.[10] The Company provided its customers with a 10-day period to opt-out of the Load Research Study. Following the replacement of a customer's meter with a new load research meter, a notification was left at the premise to inform the customer their meter was replaced with a new load research meter. Approximately 4% of the customers selected to participate in the Load Research Study opted not to participate. Those customers were replaced with other customers in the same rate class with similar characteristics.

Meter Installation

In advance of meter delivery in September 2024, Newfoundland Power developed a plan to install the load research meters on customer premises. The plan included assessing the geographic location, rate classes and meter type of the customers participating in the Load Research Study. Once the meters were received by Newfoundland Power, they were dispatched and installed on the customer premise. All meters were successfully installed throughout the Company's service territory by December 1, 2024 in advance of the 2024-2025 winter season.

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8 The CC&B system was commissioned and brought into service in August 2023, replacing Newfoundland Power's legacy Customer Service System ("CSS").

9 The level of precision used by DNV was ±10% at a 90% level of confidence. See DNV *Load Research Study Plan, June 15, 2023,* page 5, footnote 1.

10 The opt-out strategy was recommended by DNV. See DNV *Load Research Study Plan, June 15, 2023*, page 15.

3.2 2025 Load Research Activities

Procurement of meters, integration and testing of the meters with Newfoundland Power's metering and billing systems, customer recruitment, and installation of meters in 2024 have enabled the Company to begin collecting the necessary customer load data.

Key elements of the Load Research Study that are planned for the remainder of 2025 include completion of data collection for the 2024-2025 winter season, validating, editing and estimating the data, and analyzing the customer load data. A report from DNV will be circulated to the Parties following the analysis of the customer load data collected over the 2024-2025 winter season. Collection of customer load data will continue throughout 2025 and into the 2025-2026 winter season. This will require continued review of the customer sample and potential installation of additional load research meters to ensure the statistical integrity of the customer load data is maintained.

3.3 Updated Load Research Study Cost Estimate

Newfoundland Power has updated its cost estimate to reflect Load Research Study progress to date. Table 1 provides the updated cost estimate.

Table 1:
Updated Cost Estimate
Load Research Study
($000s)

Description	2022	2023	2024	2025E	2026E	Total
Internal Labour	15	73	111	100	90	389
External Labour	--	42	48	120	110	320
Metering Costs	--	--	325	60	60	445
Total	**15**	**115**	**484**	**280**	**260**	**1,154**

Costs incurred for the Load Research Study in 2024 are primarily related to: (i) meter procurement and installation; (ii) integration and field testing of the load research meters with Newfoundland Power's metering and billing systems; (iii) customer recruitment; and (iv) installation of the meters at customer premises. Costs in 2024 were lower than estimated.[11] This is primarily due to use of internal Newfoundland Power resources to complete meter integration activities and the lower cost of installing meters throughout the service territory.

[11] Costs associated with the Load Research Study in 2024 were $484,000. This compares to estimated costs of $620,000 as detailed in the *Load Research and Rate Design Update – March 28, 2024*, page 4.

4.0 Rate Design

Newfoundland Power serves approximately 277,400 customers. This includes approximately 241,400 Domestic Customers, 24,500 General Service Customers, and 11,400 Street and Area Lighting Customers. The majority of the Company's Domestic customers' rates include monthly Basic Customer Charges and a flat kWh energy rate.[12] General Service customers' rates include monthly Basic Customer Charges, demand charges that vary by season, and energy charges that vary depending on monthly consumption.[13] Street and Area Lighting customers pay a monthly rate based on the type and size of equipment installed.

The standard for assessing the appropriateness of customer rate design is guided by the Criteria of Sound Rate Structure described by James Bonbright in *Principles of Public Utility Rates.*[14] These criteria include effectiveness, practicality, stability, efficiency, and fairness. The Board has previously recognized these criteria in establishing customer rates.[15]

4.1 Rate Design Review Update

Newfoundland Power completed Phase One of its Rate Design Review in 2024. This included completion of the Christensen Associates ("Christensen") *Rate Design Review: Phase 1* report (the "Phase One Report") which was provided to the Parties on April 2, 2024.

The Phase One Report included: (i) a review of Newfoundland Power's existing rates; (ii) a review of Newfoundland Power's existing metering capabilities; (iii) anticipated changes in Newfoundland Power's marginal supply costs; (iv) a review of customer rates in other Canadian jurisdictions; and (v) a description of alternatives that should be considered in Phase Two of the Rate Design Review.

The review of Newfoundland Power's existing rates concluded that Newfoundland Power's customer rates are simple, stable, recover costs fully, and are structured to provide marginal price signals.[16] The Phase One Report also acknowledged the limitations of Newfoundland Power's existing metering system which cannot support implementation of complex rate designs including time-varying pricing.[17]

The Phase One Report included information on anticipated changes to Hydro's Utility rate charged to Newfoundland Power. The anticipated changes included a two-tier declining block structure with the tier-2 price reflecting some measure of market-based energy prices.[18] Since

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12 Approximately 1,200 of Newfoundland Power's customers avail of the Domestic Seasonal – Optional rate which includes seasonal energy charges for consumption during December through April and May through November. Domestic Seasonal – Optional customers are charged the same monthly Basic Customer Charge as all other Domestic customers. Domestic customer Basic Customer Charges are dependent on the size of the customer's service (i.e. those not exceeding 200 Amp Service, and those exceeding 200 Amp Service). Newfoundland Power's Domestic customer rates also include a 1.5% early payment discount.

13 Newfoundland Power's three General Service Rate Classes include: Rate 2.1 0-100 kW (110 kVA); Rate 2.3 110 kVA (100 kW) – 1000 kVA; and Rate 2.4 1000 kVA and Over. General Service customer charges also include a 1.5% early payment discount, a Minimum Monthly Charge, and a Maximum Monthly Charge.

14 Bonbright, *Principles of Public Utility Rates,* Public Utilities Reports, 1988, Pages 383-384.

15 See, for example, Order No. P.U. 19 (2003).

16 Christensen Associates, *Rate Design Review: Phase 1*, April 1, 2024, page 8.

17 Ibid, page 9.

18 Ibid, page 12.

the Phase One Report was provided to the Parties, Hydro's Utility rate to Newfoundland Power was revised.[19] The new Utility rate includes a two-tier inclining block energy rate during the winter months and a two-tier declining block energy rate during the non-winter months.[20] The actual change in the Utility rate will be considered in Phase Two of the Rate Design Review.

The jurisdictional review included in the Phase One Report consisted of 16 Canadian utilities, including Newfoundland Power. The jurisdictional review demonstrated that Newfoundland Power's current rates are comparable to the default rates of other Canadian jurisdictions. The review also identified emerging rate alternatives that are being employed by Canadian and U.S. utilities to address a wide variety of challenges and rate making goals.[21]

The Phase One Report indicated that Newfoundland Power seems well-positioned with its current rate designs. The Phase One Report recommended Newfoundland Power leave current rate designs in place, adjusting the customer, energy, and demand charges to ensure full cost recovery under Hydro's new price levels and to more adequately reflect changes in Hydro's marginal costs. The Phase One Report also recommended consideration of seasonal prices for the Company's default rate designs, a dual electric space heating rate, and a longer-term curtailable rate for large customers.[22]

The results of the Phase One Report were presented to the Parties on August 14, 2024. The Parties were invited to provide a response to the Phase One Report including expert reports and any additional data or analysis. Comments were received from the Parties by September 13, 2024.

4.2 2025 Rate Design Review Activities

Newfoundland Power commenced Phase Two of the Rate Design Review in 2025. This follows: (i) the completion of Phase One of the Rate Design Review; (ii) additional clarity regarding cost recovery associated with the Muskrat Falls Project due to finalization of the Provincial Government rate mitigation plan; and (iii) the establishment of a new Utility rate charged from Hydro to Newfoundland Power to more accurately reflect supply costs.

Key tasks planned for 2025 include: (i) establishing a customer engagement plan with feedback from the Parties; (ii) conducting customer engagement activities; (iii) completion of a distribution marginal cost study; (iv) working with Christensen to establish an appropriate model for assessing Newfoundland Power's existing rates and rate design alternatives; and (v) modelling rate designs and completing technical analysis to inform future rate designs.

Newfoundland Power will also be incorporating the direction of the Board following its Order in relation to Newfoundland Power's *2025/2026 General Rate Application* in its 2025 Rate Design Review activities. This includes: (i) evaluation of the reasonableness of the existing rate

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19 See Order No. P.U. 1 (2025).

20 Historically, the Utility rate to Newfoundland Power included a tier 1 energy charge and a tier 2 energy charge that were applicable throughout the year. The new Utility rate approved by the Board, includes a tier 1 and tier 2 energy charge for the months of January, February, March, and December and separate tier 1 and tier 2 energy charges for the months of April through November.

21 Christensen Associates, *Rate Design Review: Phase 1*, April 1, 2024, page 56.

22 Ibid, page 55.

structure and cost recovery for Memorial University and other customers primarily served by transmission assets;[23] and (ii) a review of the Company's general service contribution policy for transmission assets.[24]

4.3 Updated Rate Design Review Cost Estimate

Newfoundland Power has updated its cost estimate to reflect Rate Design Review progress to date. Table 2 provides the updated cost estimate.

Table 2:
Updated Cost Estimate
Rate Design Review
($000s)

Description	2022	2023	2024	2025E	2026E	Total
Internal Labour	13	57	61	65	40	236
External Labour	--	70	93	190	52	405
Customer Engagement	--	--	--	70	30	100
Total	**13**	**127**	**154**	**325**	**122**	**741**

Costs incurred in 2024 are primarily related to completion of the Phase One of the Rate Design Review. Costs in 2024 were lower than estimated.[25] This is primarily due to Newfoundland Power's *2025/2026 General Rate Application* which delayed Newfoundland Power's ability to conduct customer engagement activities. Costs in 2025 and 2026 are primarily related to Phase Two of the Rate Design Review including customer engagement activities and a technical analysis of Newfoundland Power's customer rates. Costs in 2025 and 2026 are higher than the previous estimate due to pricing received from a third-party customer engagement specialist, and the additional requirement for the Company to complete a review of Newfoundland Power's General Service contribution policy for transmission assets.[26]

The overall estimated cost associated with the Load Research Study and the Rate Design Review is consistent with the *Load Research and Rate Design Framework*.[27]

[23] See Order No. P.U. 3 (2025), page 59, lines 27-30.
[24] Ibid, page 60, lines 26-27.
[25] Costs associated with the Rate Design Review were $154,000 in 2024. This compares to estimated costs of approximately $205,000 as detailed in the *Load Research and Rate Design Update – March 28, 2024,* page 6.
[26] Newfoundland Power will consult with the Parties prior to commencing customer engagement activities.
[27] The overall estimated cost of the Load Research Study and Rate Design Review, as detailed in the *Load Research and Rate Design Framework* provided to the Board on December 30, 2022, was $1,900,000. The current overall estimate is $1,895,000.