Q. Please address the issue of intergenerational equity with respect to the electrification proposals and particularly the fact that costs are incurred beginning in 2021 but the rate mitigation benefits do not materialize until later in the period 2021 to 2034.

A. *This Request for Information relates to the Electrification, Conservation and Demand Management Plan: 2021-2025 (the "2021 Plan") developed in partnership by Newfoundland Power and Newfoundland and Labrador Hydro ("Hydro" or, collectively, the "Utilities"). Accordingly, the response reflects collaboration between the Utilities.*

Intergenerational equity is a principle of fairness that holds that ratepayers in a given period should pay only the costs necessary to provide them with service in that period.[1]

Regulatory principles, including the principle of intergenerational equity, must be considered together with the requirements of the provincial power policy. The provincial power policy requires that services and facilities be managed in a manner that results in the most efficient generation, transmission and distribution of power to customers. The policy also requires that customers be provided with reliable service at the lowest possible cost.[2]

It is typical for upfront costs to be required in order to achieve long-term efficiency benefits that enable least-cost service delivery. The Board routinely considers the long-term customer benefits resulting from upfront utility investment.

For example, in Order No. P.U. 37 (2020), the Board recognized the upfront investment and customer benefits associated with the Company's *LED Street Lighting Replacement Plan.* In that order, the Board stated:

> *Expenditures associated with the LED street lighting replacement plan which will cost approximately $32.8 million over six years and are estimated to reduce energy and maintenance costs by $52 million over 20 years resulting in lower overall costs for customers.*[3]

The net present value ("NPV") analysis for the *LED Street Lighting Replacement Plan* showed a negative customer impact for the first 6 years when compared to current practice at that time. The customer benefits of the plan became positive in year 7 and continued through year 20 of the analysis. On an NPV basis, the plan will result in lower overall costs for customers of $4.9 million over 20 years.[4]

The Board has also approved various Application Enhancements projects proposed by Newfoundland Power as part of its annual capital budget applications. These projects typically include cash outlays in year 1 to achieve longer term operating efficiencies. On

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1 Intergenerational equity is one of a number of regulatory principles that have been considered by the Board. See, for example, Order No. P.U. 7 (2002-2003), page 27, *et. seq.*

2 See Section 3(b) of the *Electrical Power Control Act, 1994.*

3 See Order No. P.U. 37 (2020), page 10.

4 See the *2021 Capital Budget Application, Volume 1, LED Street Lighting Replacement Plan, Appendix B Net Present Value Analysis*.

a cumulative basis, the NPV associated with these projects are typically not positive in the first 5 years. However, the initiatives produce a positive cumulative NPV by year 7 and result in long-term customer benefits through lower annual customer costs.[5]

In Order No. P.U. 28 (2015), the Board approved a project associated with the Company's deployment of Automated Meter Reading ("AMR"). The deployment of AMR meters required a capital investment of approximately $17 million from 2013 to 2017. This investment will reduce the Company's meter reading costs over the long term. For example, annual meter reading costs were approximately $2 million lower in 2020 as compared to 2012.[6]

The cumulative and enduring benefit of electrification programs is also similar to that of CDM programs.

Table 1 provides the cumulative utility investment and customer benefits resulting from Newfoundland power's CDM programs since 2009.

Table 1:
Newfoundland Power
CDM Programs
Utility Investment and Customer Benefits
($millions)

Year	Cumulative Customer Benefit	Cumulative Utility Investment[7]	Difference
2009	0.4	2.3	(1.9)
2010	1.8	5.3	(3.5)
2011	5.9	9.2	(3.3)
2012	12.0	12.2	(0.2)
2013	18.9	15.9	3.0
2014	28.7	21.2	7.5
2015	37.5	25.1	12.4
2016	46.2	32.8	13.4
2017	61.5	40.3	21.2
2018	83.2	47.1	36.1
2019	109.7	54.5	55.2
2020	136.8	60.4	76.4

[5] See, for example, the *2021 Capital Budget Application, Volume 2, 6.1 Application Enhancements*, Appendix C which shows an NPV analysis for the Digital Forms System Enhancements project. The upfront investment was approximately $145,000. By year 7, the cumulative NPV was a positive $38,000. The project was approved by the Board in order No. P.U. 37 (2020).

[6] In 2012, meter reading costs were $2.8 million. In 2020, meter reading costs were $0.5 million.

[7] Includes all CDM related costs (i.e. capital, program, planning and general costs).

For CDM programs, utility investment outweighed the associated customer benefits in the early years of program delivery. By year 5, customer benefits net of utility investment became positive, thereby reducing overall costs to customers.

The long-term rate mitigating benefit of the Utilities' customer electrification programs is consistent with the provision of efficient, least-cost service to customers and previous decisions by the Board that recognize the long-term customer benefits of upfront utility investments.

Table 2 provides the *pro forma* annual rate and customer billing impacts resulting from Newfoundland Power's customer electrification initiatives over the period 2021 to 2034.

Table 2:
Newfoundland Power
Electrification Programs
***Pro Forma* Customer Rate and Bill Impacts**

Year	Rate Benefit (¢/kWh)[8]	Average Annual Customer Bill Benefit ($)
2021	(0.002)	(0.4)
2022	(0.009)	(1.8)
2023	(0.016)	(3.1)
2024	(0.020)	(4.0)
2025	(0.018)	(3.6)
2026	0.002	0.4
2027	0.042	8.3
2028	0.087	17.2
2029	0.131	25.8
2030	0.192	37.9
2031	0.261	51.5
2032	0.340	67.1
2033	0.426	84.0
2034	0.519	102.4

The customer bill impacts observed from 2021 to 2025 are relatively small, ranging from $0.40 to $4. After turning positive in 2026, the benefit to customers increases from $8 per year in 2027 to over $100 per year in 2034.

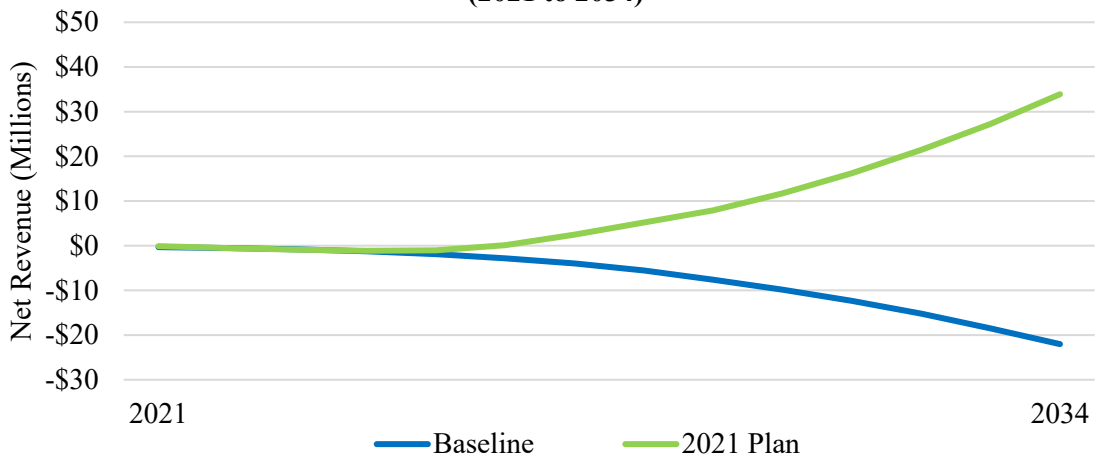
Based on these costs and benefits, in Newfoundland Power's view, planned electrification initiatives reasonably balance the principle of intergenerational equity and the requirements for efficient, least-cost service delivery.

[8] See Table 1 in response to Request for Information PUB-NP-009.

Furthermore, without utility intervention (i.e. the "baseline scenario"), transportation electrification will cause system costs to increase.[9] This is largely due to an increase in capacity-related system costs resulting from the unmanaged charging of electric vehicles ("EV").

Figure 1 shows the rate mitigating benefit of electrification from 2021 to 2034 under the baseline scenario and with implementation of the 2021 Plan, which includes load management.[10]

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



While, on an NPV basis, the electrification programs outlined in the 2021 Plan will provide a benefit of approximately $34 million by 2034, the unmanaged charging of EVs would increase costs to customers by approximately $22 million by 2034.

[9] The baseline scenario forecasts adoption based on current levels of investment and support and assumes EV load is unmanaged. See Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application,* Volume 2, 2021 Plan, 3.1.1 Transportation Electrification, page 5, *et. seq.*

[10] Ibid., Volume 1, Exhibit 2, page 2, Figure 1.