Q. Was any analysis conducted as to the optimal amount of the utility EV and charging infrastructure incentives in terms of how effective varying amounts of incentives would be in removing barriers and accelerating EV adoption over the short and long term?

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.*

The EV and charging infrastructure incentives included in the 2021 Plan were determined via a process consistent with that used by the Utilities for conservation and demand management ("CDM") programs.[1] The process for establishing optimal incentive amounts includes: (i) determining whether an incentive is required to address barriers to customers' adoption of a technology; (ii) determining the initial incentive amount based on market factors, industry practice and utility objectives; and (iii) evaluating changes in incentive amounts over time based on program performance, market factors and industry trends.

i. Determining Requirement for Incentives

A 2019 survey completed by MQO Research determined that the cost of an EV was a primary barrier to EV adoption among residents of Newfoundland and Labrador.[2]

Table 1 provides the forecast average cost of an EV compared to the average cost of an internal combustion engine ("ICE") vehicle from 2021 to 2025.[3]

Table 1:
Incremental Cost of an EV
2021 to 2025 Forecast
($000s)

	2021	**2022**	**2023**	**2024**	**2025**
EV	41	38	34	29	26
ICE	22	22	23	23	24
Difference	**19**	**16**	**11**	**6**	**2**

[1] Customer incentives are the foundation of CDM programming. For example, over 3 million at-the-cash rebates and over 60,000 on-bill rebates for energy-efficient technologies have been provided to Newfoundland Power's customers since 2009. These rebates have resulted in electricity bill savings of approximately $118 million and reduced system costs of approximately $137 million.

[2] The primary barriers to EV adoption reported by Newfoundland and Labrador residents were vehicle cost and access to charging and concerns regarding reliability of range.

[3] 2021 costs are based on current market prices. Forecast changes in EV costs over the 2022 to 2025 period are based on forecast changes in battery costs. Forecast changes in ICE costs over the period are inflation related.

The upfront cost to purchase an EV is currently $19,000 higher than the cost of purchasing an ICE. A $5,000 Federal Government rebate lowers this cost differential.

In addition to the cost of the EV, most customers would also be required to install a Level 2 charger to charge their EV at home or at their business.[4] For a residential customer, the additional cost of an average Level 2 charger with no networking capabilities is approximately $500.[5] The average price for a network capable EV charger is approximately $1,000.[6] Commercial Level 2 EV charging infrastructure is generally more expensive than residential Level 2 charging equipment due to the features and structure of the charger.[7]

In the Utilities' experience, incentives are effective at increasing customers' adoption of new technologies in the province. The 2020-2034 Potential Study (the "Study") by Dunsky Energy Consulting provides that EV incentives could increase EV load by 16% to 32% over the short-term, until cost parity is achieved with ICE vehicles.[8] In addition, the installation of network capable chargers is paramount for future customer programs to incentivize off-peak charging.[9]

Based on these factors, the Utilities determined that EV and charger incentives would address a primary barrier to customers' adoption of EVs and support future load management requirements.

ii. Determining Initial Incentive Amounts

In determining EV and charging infrastructure incentive amounts for the initial program offering, the Utilities considered current market factors, industry practice and 2021 Plan objectives.

Currently, a financial incentive would work in conjunction with the federal incentive to reduce the upfront cost of an EV for customers. This was taken into consideration by the Utilities in determining initial incentive amounts.

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4 Level 2 chargers significantly reduce the time to charge an EV. Using a typical home socket (i.e. Level 1), the time to fully charge an EV could range from 9 to 50 hours. Using a Level 2 charger would reduce the time to fully charge to 2 to 9 hours. A Level 2 charger requires a 240 V service.

5 A non-networked charger does not have the capability to connect to the internet or cellular network. As a result, it simply provides the function of supplying electricity to a vehicle. The average cost excludes installation costs.

6 A networked charger has the capability to connect to the internet or cellular network. Networked chargers have the ability to collect usage data, monitor for problems, provide peak load management or charge users a fee for charging. The average cost excludes installation costs.

7 See response to Request for Information PUB-NP-041 for differences in installation costs.

8 See Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application,* Volume 2, Schedule C, page 139.

9 See response to Request for Information PUB-NP-037 for 2021 Plan initiatives that will inform the Utilities' approach to effective peak load management.

Table 2 provides the net benefits a customer could experience when purchasing an EV at a range of incentive levels when used together with the $5,000 federal incentive.[10]

Table 2:
Customer Net Benefit of EV Purchase
(Net Present Values)

Utility Incentive Amount	**$0**	**$2,500**	**$5,000**	**$8,000**
Reduction in Incremental Cost[11]	25%	40%	50%	70%
Net Customer Benefit[12]	$1,800	$4,000	$6,000	$9,000

The federal incentive reduces incremental cost to purchase an EV by 25%, resulting in a net customer benefit of $1,800 over the life of a vehicle. Incentive amounts ranging as high as $8,000 could reduce the incremental cost of purchasing an EV by up to 70%, resulting in a net customer benefit of up to $9,000 over the life of a vehicle.

Given the wide range of potential incentive amounts, the Utilities considered industry trends in determining the appropriate incentive amount.

Table 3 provides EV incentive amounts provided in other Canadian jurisdictions.

Table 3:
EV Incentives by Jurisdiction

Province	**EV**
British Columbia	$3,000
Quebec	$8,000
Nova Scotia	$3,000
Prince Edward Island	$5,000
Northwest Territories	$5,000
Newfoundland and Labrador[13]	$2,500

[10] The costs include the incremental vehicle purchase cost and the cost of electricity over the expected life of the vehicle. Customer benefits included in the analysis are the takeCHARGE incentive, Federal incentive and fuel and maintenance savings over the life of the technology.

[11] Includes the federal rebate of $5,000.

[12] Approximate net present value ("NPV") of the related costs and benefits of owning an EV. Includes the federal rebate of $5,000.

[13] See response to Request for Information PUB-NP-040 for information on the current Newfoundland and Labrador EV incentive.

Given the incentive levels in other provinces, a minimum incentive of $2,500 for EVs was determined to be appropriate.[14] This incentive amount, in combination with the federal incentive, would reduce the upfront cost of purchasing an EV by 40% and provide a net customer benefit of $4,000 over the life of the vehicle.

The Utilities then assessed whether a higher incentive amount would be beneficial based on the objective of the 2021 Plan. The objective of the 2021 Plan is to increase energy sales through EV adoption in order to support the provincial policy goal of customer rate mitigation.

An incentive amount of $2,500 would increase energy sales from EV adoption which, in turn, would increase net revenues by $10 million to $11 million over the 2021 to 2034 period.[15] While higher incentive amounts could increase EV adoption further, net revenues per EV would diminish. This demonstrates the diminishing contribution of higher incentive amounts towards the policy goal of customer rate mitigation.[16]

The Utilities therefore determined that $2,500 per EV was appropriate.

The charger incentive amount of $500 was set to offset the incremental cost of a network capable charger versus a non-network capable charger.[17] The $500 residential EV charger incentive is also consistent with incentive amounts in other provinces.[18]

Commercial Level 2 EV charging infrastructure is generally more expensive than residential Level 2 charging equipment due to the features and structure of the charger.[19] The Utilities considered commercial charger infrastructure amounts offered in other provinces.[20] An incentive amount of 50% of the purchase and installation costs, up to a maximum of $3,000, was set based on these considerations.

[14] Similarly, a minimum incentive of $1,000 for plug-in hybrid EVs ("PHEV") appeared appropriate given incentives provided in other jurisdictions ranged from $500 to $8,000.

[15] Net revenues consider both incremental revenues and incremental system and program costs.

[16] The net benefit per EV to rate mitigation at an incentive level of $2,500 is approximately $500 over the life of the EV. Any dollar increase in the incentive amount would result in a dollar reduction in the per EV rate mitigation benefit of $500. For example, an EV incentive amount of $3,000 would effectively offset any rate mitigating benefit for that particular EV.

[17] The average cost of a network capable charger of $1,000, less the cost of a non-network capable charger of $500.

[18] For example, Quebec provides a rebate up to $600 and British Columbia provides a rebate up to $700 towards the cost of eligible charging equipment and installation. Yukon provides a rebate of $750 on eligible charging equipment and installation when installed in a private residence (up to 50% of purchase and installation costs).

[19] See response to Request for Information PUB-NP-041 for differences in residential and commercial installation costs.

[20] For example, Quebec provides a rebate up to $5,000 of the cost of eligible charging equipment and installation. British Columbia provides rebates of $4,000 and $2,500, respectively on eligible charging equipment and installation (up to 50% of purchase and installation costs). Yukon provides a rebate of $4,000 on eligible charging equipment and installation (up to 50% of purchase and installation costs).

iii. Evaluating Incentive Amounts

The EV and infrastructure incentive programs will be monitored for participation levels and cost effectiveness on a bi-annual basis, including changes in market factors and industry trends. A formal evaluation of the program will be conducted by a third party following the first year of operation. Similar to the Company's CDM programs, changes to incentives amounts will be implemented, as required.

For example, the ENERGY STAR Window Rebate Program was offered over the 5-year period 2009 to 2014 to lower the incremental cost of purchasing ENERGY STAR rated windows.[21] The program ended following an evaluation of retailer/contractor feedback and market data that determined ENERGY STAR windows were becoming the industry standard. Incentives were therefore no longer required to influence the market.[22]

EV incentive amounts included in the 2021 Plan are expected to change over time as EVs approach cost parity with ICE vehicles. After 2023, the incentive for an EV is forecast to be reduced by $1,000.[23] Similar to CDM programs, any changes will be informed by program evaluation and market research.

[21] At the time, the incentive amount of $2 per square foot was informed by similar rebates offered in other provinces.

[22] Customers continue to benefit from the customer uptake of that program over that 5-year period. For example, lower system costs as a result of the program is estimated to be $20 million over the 2009 to 2020 period.

[23] Similarly, the incentive for a PHEV is forecast to be reduced by $500 before ending by 2025.