Q. (Reference EV Load Management Pilot Project, page 8) Figure 3 shows Forecast Unmanaged Peak Demand Impacts of Light-Duty EV Adoption:

a) Please confirm that under the moderate growth scenario the expected unmanaged peak demand impact is about 40MW in 2030.

b) What is NP's best estimate of the amount of this peak demand impact that will be manageable in a cost-effective manner by 2030? In this regard, what have other utilities in Canada found in their EV load management pilots?

c) How much would a 20MW increase in peak demand impact customer costs in 2030? Please provide the calculation and all assumptions.

d) If the proposed EV charging pilot program were delayed by two years, would NP still be in a position to manage EV charging demand in 2030? Please explain.

e) Please provide a table that gives the numerical estimates for each year and for each of the three growth scenarios given in Figure 3.

f) For the forecasts in Figure 3, what assumptions are made about the proportion of the light-duty EVs that are charged with Level 1, Level 2 and Level 3 chargers?

g) Are the forecasts in Figure 3 consistent with the focus of the pilot project, i.e., do they correspond solely to charging at home by residential customers who own light-duty EVs?

i. Please clarify what is meant by Unmanaged Peak Demand Impact. Specifically, is it the increment in peak demand impact over and above some target or assumed managed peak demand impact? Or is it the full peak demand impact assuming no demand management measures are in place for light-duty EVs?

ii. If it is the full peak demand impact then please provide a table showing the assumed or targeted managed peak demand impact of light-duty EVs for the same years as in Figure 3.

A. a) The results of the model completed by Dunsky Energy + Climate Advisors ("Dunsky") for Newfoundland and Labrador Hydro's ("Hydro") *Reliability and Resource Adequacy Study* indicates an unmanaged peak impact of 35.6 MW under the moderate growth scenario in 2030.

b) Dunsky's model used for Hydro's *Reliability and Resource Adequacy Study* estimated up to approximately 14 MW of EV load could be shifted off peak in 2030 under the moderate growth scenario.

Estimates of the amount of EV load that can be shifted off peak vary in studies conducted throughout North America. For example, in the 2019 *Conservation Potential Study*, Dunsky referenced a Toronto Hydro study indicating that upwards of 85% of EV load can be shifted to off-peak times.[1] Other studies have indicated ranges of up to 50% to 94% of EV load that can be shifted off peak.[2]

[1] See Newfoundland Power's *2021 Electrification, Conservation and Demand Management Application, Volume 2*, Schedule C, page 148 of 325.

[2] For example, Southern California Edison indicates up to 50% of peak from EVs can be shifted, whereas a study completed in San Diego indicated upward of 94%.

The proposed pilot project will gain a firmer understanding of the best estimate of EV load that can be shifted off peak in Newfoundland and Labrador.

c) Using Hydro's December 2022 Marginal Cost Estimates for 2030 of $273.35 per kW, an increase of 20 MW in peak demand would increase costs to customers by approximately $5.5 million.[3]

d) A two-year delay in implementing the proposed EV Load Management Pilot Project would delay the implementation of programs to manage EV load which, in turn, would likely reduce the customer benefits achievable by 2030. For example, the pilot project is designed to evaluate the cost-effectiveness of options to manage EV load prior to EV adoption increasing beginning in 2026 in response to a federal target.[4] If EV load management options have not been assessed by this time, the Company would miss an important opportunity to influence the technologies adopted by customers over this period, such as the potential to incent customers to adopt Level 2 smart chargers capable of load management. Potential benefits to customers would therefore not be realized.

e) Table 1 provides the numerical estimates for the unmanaged peak impacts of light-duty EVs for each year, under each growth scenario identified in Figure 3.

Table 1
Estimated Unmanaged Peak Demand Impacts by Scenario (MW)
2025-2040

Year	Low Growth	Moderate Growth	High Growth
2025	3.3	4.8	5.3
2026	4.7	7.9	9.1
2027	6.9	12.2	14.8
2028	10.0	18.0	23.4
2029	14.7	25.7	35.6
2030	20.9	35.6	51.5
2031	29.6	47.6	70.5
2032	40.1	61.9	92.2
2033	52.3	78.7	116.4
2034	66.0	98.1	143.0
2035	80.8	119.4	171.7
2036	96.6	142.7	202.5
2037	113.2	167.8	235.1
2038	130.7	194.7	269.6
2039	149.0	223.5	305.8
2040	168.0	254.1	343.4

[3] $273.35 per kW x 20 MW x 1,000 = $5,467,000.
[4] See the response to Request for Information CA-NP-008.

f) The forecasts in Figure 3 are derived from Dunsky's model for Hydro's *Reliability and Resource Adequacy Study*. These results indicate unmanaged charging peak impacts at 10:00 pm with charging broken down by location. For 2030 it estimates peak impacts come from: (i) 10% depot charging; (ii) 85% home charging; (iii) 4% public charging; and (iv) 1% workplace charging. The data does not specify how much of each charging type is at Level 1, Level 2 or Level 3.

g) See part f).

i. The unmanaged peak demand impact is the full incremental impact on system peak stemming from unmanaged load relating to EV adoption.

ii. Table 2 outlines the estimated amount of peak that can be shifted by year, derived from Dunsky's model for Hydro's *Reliability and Resource Adequacy Study*, under each growth scenario identified in Figure 3.

Table 2
Estimated Managed Peak Demand Impacts by Scenario (MW)
2025-2040

Year	Low Growth	Moderate Growth	High Growth
2025	1.3	1.9	2.2
2026	1.9	3.2	3.7
2027	2.8	4.9	6.0
2028	4.1	7.3	9.5
2029	6.0	10.4	14.4
2030	8.6	14.4	20.9
2031	12.0	19.3	28.6
2032	16.3	25.1	37.4
2033	21.2	31.9	47.2
2034	26.8	39.8	58.0
2035	32.8	48.5	69.7
2036	39.2	57.9	82.2
2037	46.0	68.1	95.4
2038	53.1	79.0	109.4
2039	60.5	90.7	124.1
2040	68.2	103.1	139.4