Q. **Reference: Economic and Technical Assessment, page 44 (p. 78 pdf)**

Citation:

> The forecast coincident peak for the entire southern Labrador system is about 3.6 MW by the year 2025. The southern Labrador interconnection would be designed to support approximately 8 MW of demand, assuming the incremental load is spread uniformly amongst the four communities. The capacity of each existing system is provided in Table 18, which is compared against the proposed capacity of a southern Labrador interconnection. It is evident from Table 18 that an interconnected solution provides a more effective capacity solution. Therefore, it can be concluded that some form of southern Labrador interconnection would be better equipped to accommodate incremental increases in demand. (underlining added)

a. Please explain the underlined statement (8 MW of demand).

b. Please explain why it is necessary to support 8 MW of demand, given that the load forecasts in Table A-1 show a combined 2039 demand of only 3,681 kW (only marginally greater than the 2025 forecast).

c. Has Hydro explored the implications of a substantial reduction in demand in the four communities on the economics of the proposed project? If so, please present the results of this analysis.

d. Please compare the CPW costs for serving the communities with the proposed project or the status quo approach in the event of a significant reduction in population, resulting in a of 25% reduction of energy requirements and demand in the four communities, by 2035.

A. a. The southern Labrador interconnection, which includes the diesel generating station substation and distribution interconnection lines, was not specifically designed to support an additional load of 8 MW, more so, the system was designed to support the forecasted peak load and reduce system losses. The resulting design will create a system that will have a capacity of 8 MW. Components such as the substation transformers, for example, have an initial capacity of 5 MVA but can easily be upgrade to 6.6 MVA or 8 MVA with the addition of

extra fans for cooling. Other design decisions such as selecting a distribution conductor size of 477 ASC to reduce losses and including voltage regulators to maintain appropriate voltage levels, which is required at existing load levels, will allow the system to support load at or beyond 8 MW.

b. Please refer to part a of this response.

c. A substantial reduction in demand in the four communities was considered at a high level.[1] Newfoundland and Labrador Hydro ("Hydro") concluded that reductions in demand would not influence the results of the cumulative present worth ("CPW") analysis as the decrease in cost associated with de-rating equipment is not material in relation to the total capital cost of a new diesel plant.[2] As demonstrated in Attachment 1 to Hydro's application,[3] even a significant reduction in capital costs associated with new diesel plants would not influence the outcome of the CPW analysis. The design of the 25 kV interconnection would remain unchanged with a substantial decrease in customer demand. Given the long distances between the communities, the proposed design of the 25 kV interconnection is technically required to ensure power is reliably delivered to the customers at an acceptable voltage level, even at lower demand.

d. Table 1 summarizes the CPW for each alternative with a 25% reduction of energy requirements in the four communities by 2035 with no further change in energy requirements for the remainder of the 50-year study. As demonstrated in Table 1, a 25% reduction in energy consumption does not change the outcome of the CPW analysis.

[1] Historical and forecast loads indicate either stable or increasing loads for each of the four communities for the period 2020–2070. Please refer to Hydro's response to NP-NLH-044 for historical energy and demand from 2000–2020, and "Long-Term Supply for Southern Labrador," Newfoundland and Labrador Hydro, July 16, 2021, sch. 1, att. 1, app. A, for a baseline demand and energy forecast (net) for the period 2020–2070.

[2] As indicated in "Long-Term Supply for Southern Labrador," Newfoundland and Labrador Hydro, July 16, 2021, sch. 1, att. 1, p. 33, table 7, the capital cost of replacing the Charlottetown Diesel Generating Station is approximately $21,400,000. The decrease in cost in a 1,200 RPM 1,000 kW diesel genset and a 1,200 RPM 600 kW diesel genset would be approximately $200,000.

[3] "Long-Term Supply for Southern Labrador," Newfoundland and Labrador Hydro, July 16, 2021, sch. 1, att. 1, sec. 6.1, p. 42/20–25.

Table 1: CPW with 25% Reduction in Energy Requirements by 2035

	Cumulative Net Present Value (CPW) ($ million)
Alternative 1	162
Alternative 2	169
Alternative 3a	137
Alternative 3b	139

Each of the alternatives assessed would depend on diesel generation as the main source of generation; therefore, the fuel cost per kWh would be comparable for each alternative. Since the cost per kWh for fuel is similar, changes in energy requirements are not expected to influence the outcome of the CPW analysis, which the presented analysis has verified. Hydro does anticipate some fuel efficiency improvements to result from the implementation of a single, larger, centralized diesel plant supplying the four communities (Alternatives 3a/3b), but the savings expected to be achieved as a result of the additional efficiency do not influence the outcome of the CPW analysis.