Q. **Reference Application Rev. 1, Volume 2, Additions for Load Growth – Wabush Substation Upgrades**

a. What is driving the increasing demand on the Wabush Substation?

b. Have generation and/or energy efficiency/demand management alternatives been considered to alleviate demand on the Wabush Substation?

c. Please provide the economic analysis of alternatives including all assumptions.

A.

a. Chart 1 displays historical actual peak demand for the Wabush Substation on a winter peak basis since the year 2000.

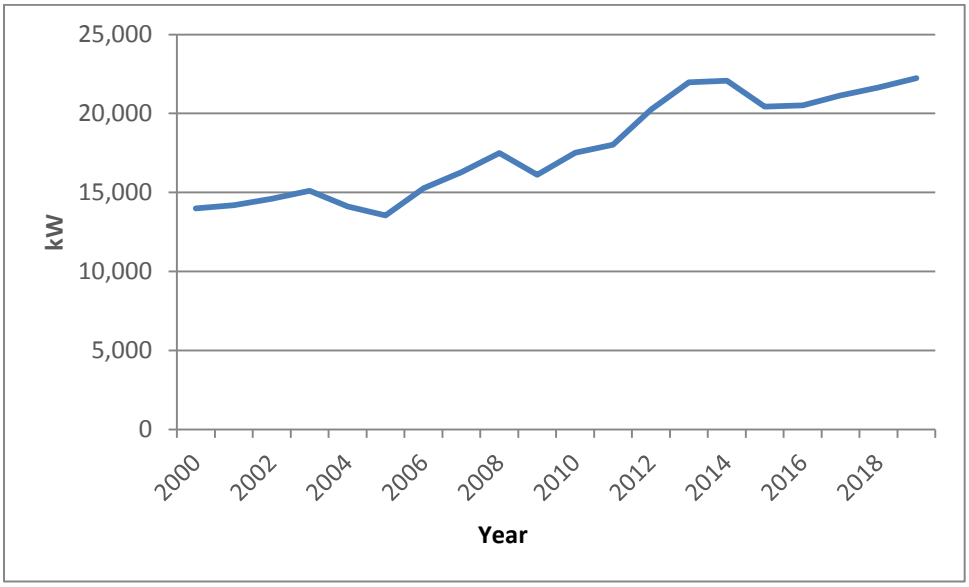

Chart 1: Wabush Substation Historical Winter Peak Demand

Historical peak demand growth for the 2000 to 2019 period has been approximately 8 MW, or 59%, and can be attributed to increased energy demand by domestic, general service and area lighting customer classes. Table 1 provides the change in annual energy sales and the

calculated annual compound growth rates in energy demand for the respective customer classes since 2000.

Table 1: Wabush Substation Change in Energy Demand from 2000 to 2019

	MWh[1]	CAGR (%)[2]
Domestic	11,492	1.9
General Service	21,371	3.0
Area Lighting	63	1.5

Newfoundland and Labrador Hydro ("Hydro") attributes the larger proportion of increased Substation demand since 2000 to the General Service class given the appreciably higher growth in energy sales for this customer group.

Across the 25-year study period from 2020 through 2045, Hydro is forecasting the Wabush Substation peak demand to increase at a slower rate than in the past, with growth forecast to be approximately 1 MW or 5%. The forecast growth in substation demand during the 2020 to 2024 period is based on general trending of customer and consumption levels that are not directly related to specific factors or drivers. The forecast growth in substation demand reflects the expectation that medium-term energy sales and resulting substation demand will be shared more equally across the domestic, general service, and area lighting customer classes than in the historic period. While not directly quantifiable, the restart of iron ore mining activities by Tacora Resources is expected to be a contributing factor to increased energy sales and substation demand during this period. The forecast growth in substation demand during the 2020 to 2024 period does not assume any material increases in load due to data centres. Forecast substation demand post 2024 reflects an allocation of overall utility growth in the western Labrador region that is expected to remain marginally positive.

b. Hydro considered installation of temporary generation to provide a backup supply in the event of a transformer failure at Wabush Substation. Equipment costs associated with the

[1] MWh are actuals, not weather adjusted.
[2] Compound annual growth rate ("CAGR").

lease and operation of mobile generation over a two-year transformer replacement time frame would be in excess of $5 million (excluding fuel costs). Additionally, the logistics of an emergency installation in winter months would be problematic.

Hydro offers its full suite of Conservation and Demand Management ("CDM") programs to customers on the Labrador Interconnected System under the takeCHARGE partnership, including customers located in the town of Wabush. These programs include energy efficiency programs such as: insulation rebates, heat recovery ventilator rebates, programmable thermostat rebates, and instant rebates on energy saving items such as LED[3] light bulbs, where participating retailers exist. Historically, uptake of energy efficiency programs on the Labrador Interconnected System is low when compared to the Island Interconnected System due to the low cost of electricity on the Labrador Interconnected System which results in the absence of a price incentive for customers.

As noted in the project description, the substation's firm capacity has already been exceeded by approximately 10%, and despite Hydro's existing CDM programs, load forecasts predict that peak loads will increase. Given the material potential impact to customers if the existing transformer was to fail during the winter peak load, Hydro's proposed capital project represents the most appropriate means by which to ensure reliable service to customers in Wabush.

c. Please refer to the "Labrador Interconnected System Transmission Expansion Study,"[4] (PUB-NLH-039, Attachment 1), specifically, Appendix C, Section 5 (pages 154 to 156 of 211), which details the economic analysis including underlying assumptions.

[3] Light emitting diode ("LED").
[4] "Labrador Interconnected System Transmission Expansion Study," Newfoundland and Labrador Hydro, rev 2, April 3, 2020 (originally filed October 31, 2018).