Q. **Reference: Application**

Please provide details of Hydro's approach to assessing the relative cost of non-wires alternatives (NWAs) and distributed energy resources (DERs) to the capital investment in traditional assets that are included in Hydro's proposed capital plan, including any reports or analyses that show the comparative analysis for the projects included in the 2022 Capital Budget Application. If NWAs have not been considered, please explain why they have been excluded as options without a comparison of alternatives.

A. Newfoundland and Labrador Hydro ("Hydro") considers a broad range of available options as part of its strategic and capital planning processes to ensure it continues to provide customers with reliable service at least cost. This includes consideration of non-wire alternatives ("NWA"). Hydro's long-term approach to planning for the interconnected system was presented to the Board in its 2018 "Reliability and Resource Adequacy Study."[1] As part of the study, alternative resources including wind, solar, battery installations, rate design, customer demand management, and capacity assistance, as well as traditional resources (e.g., hydraulic units, combustion turbines) were considered as potential sources of supply to meet changing requirements on the Newfoundland and Labrador Interconnected System.

The following provides some specific examples of Hydro's implementation and approach considering NWA in both its interconnected and isolated systems.

Energy Efficiency

Energy efficiency is considered within the development of Hydro systems load forecasts which are then used in the development of a number of projects, either as part of the primary justification, or when determining equipment size. These forecasts are based in historical energy and demand trends from each area under consideration and inherently include the impact of

[1] "Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. September 6, 2019 (originally filed November 16, 2018).

ongoing conservation and demand management programs that have been present in Hydro's systems over the past number years. Savings associated with delaying the requirement for infrastructure additions or downsizing infrastructure due to reduced energy and demand are realized by planning infrastructure additions based on this load forecast.

Distribution Energy Resources

In 2017, Hydro introduced the net metering service option for customers who generate electricity from small scale renewable sources to offset their own usage.[2]

Distribution energy resources in isolated communities or located on any of Hydro's distribution systems are considered in a similar fashion to renewable energy in general. Hydro considers the integration of wind, solar, and run-of-river hydro generation to be viable alternatives for energy displacement as these technologies do not provide firm capacity. As an example of integration of these technologies in Hydro's isolated systems, in 2019, Hydro supported the interconnection of a solar panel rooftop installation on an arena in Makkovik. The integration of this system reduced the amount of energy Hydro had to produce from its diesel generating station and resulted in lower billings for the customer. However, given the intermittent nature of renewable energy sources such as wind and solar, installed in isolated systems these resources are not considered to provide firm capability.

Demand Response and Capacity Assistance

On the Island and Labrador Interconnected Systems both demand response and capacity assistance programs have been used to help manage peak demand for both systems. In terms of demand response, Hydro supports continued use of Newfoundland Power Inc.'s ("Newfoundland Power") curtailable load program, which provides the system with up to 12 MW of curtailable load during the winter operating season. Similarly, in recent years Hydro has had an agreement with one of its customers on the Labrador Interconnected System which requires that customer curtail its load upon request to assist with peak demand management in Labrador East.

[2] As approved in *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 17(2017), Board of Commissioners of Public Utilities, May 18, 2017, to qualify for the net metering service option, a customer's generation must: (i) be designed not to exceed the customer's annual energy requirements; (ii) be 100 kW or less; and (iii) produce electricity from a renewable resource. Hydro has two net metering customers.

With respect to capacity assistance programs on the Island Interconnected System, Hydro has arrangements with some of its industrial customers to have those customers provide generation directly to the Island Interconnected System upon request. These agreements help to manage peak demand on the system in advance of the reliable in-service of the Muskrat Falls Project.

In its isolated systems, Hydro has been investigating incorporating demand response into its operations by undertaking two pilot programs in recent years; the Postville Load Control and L'Anse-au-Loup Smart Thermostat Pilot Programs. The results of these pilots indicate that direct load control in isolated systems can reduce the impact on system peak; however, the corresponding "bounce back" peaks can be higher than the original avoided peak. Hydro's next steps will include combining direct load control with energy storage technologies, such as electric thermal storage heaters, in an effort to further manage peak demand impacts.

Wide-spread demand response programs, such as offering interruptible supply agreements, are not normally considered as alternatives for Hydro's distribution and isolated generation system projects given the remote nature of Hydro's distribution systems and the required infrastructure and process to enable smart technologies.

Rate Design

Hydro seeks to offer customer rates which promote efficient usage by customers while maintaining compliance with provincial legislation and government policy. The impacts of efficient rate design are reflected in Hydro's load forecasts and therefore the 2022 Capital Budget Application.

On the Island Interconnected System, Hydro's retail rates mirror those offered by Newfoundland Power, consistent with government policy. General Service rates on the Island Interconnected System include demand charges which are higher during peak months of the year which provides a financial incentive for customers to minimize their winter peak. On its isolated systems, Hydro's domestic diesel customers have an inclining block rate, which charges higher energy rates for increased levels of consumption each month.

Industry Groups

Finally, Hydro is involved in a number of industry groups and committees as a way to stay informed of advances in technology and how they can be incorporated into the regulated utility

business. This includes advances in NWA solutions. Some industry groups and committees in which Hydro participates include:

- The Canadian Electricity Association ("CEA");[3]
- The Center of Energy Advancement through Technical Innovation ("CEATI") International;[4]
- Atlantic Power Utilities Distribution Conference ("APUDC");[5]
- Off-Grid Utility Association ("OGUA");[6] and
- Efficiency Canada.[7]

[3] The CEA includes 40 member utilities from across Canada. Hydro is a member utility.
[4] CEATI International includes 130 member utilities globally. Hydro is a member utility. This provides access to various reports on traditional poles and wires asset management, along with emerging technologies such as NWA.
[5] The APUDC is an annual conference of the Atlantic Canadian utilities including Newfoundland Power, Hydro, Nova Scotia Power, Maritime Electric, Saint John Energy, and NB Power. These conferences include presentations and discussion by the utilities on various utility initiatives, research, and projects including NWA.
[6] The OGUA is a group of all major Canadian utilities that operate isolated diesel powered electrical system for remote communities across Canada.
[7] Efficiency Canada is a research and policy group that focuses on maximizing the benefits of energy efficiency resulting in a sustainable environment and a productive economy. This includes access to a policy database that include NWAs.