Q. **Reference: Volume II - Tab 15 - Replace Metering System**

Table 1 on page 5 provides a summary of a cost-benefit analysis for the three meter reading alternatives selected by Hydro.

a) Please provide the complete study/analysis including assumptions.

b) Please provide details on the type and configuration of the proposed mesh AMI system used in the cost-benefit analysis as well as the rationale for selecting that particular type and configuration.

c) Please provide a diagram illustrating the proposed mesh configuration within a typical community.

d) Please provide a similar analysis to that contained in Table 1 with the assumption that AMI capability (e.g., time-of-use rates, etc.) is required by 2030. Please provide the complete study/analysis in addition to the summary table.

e) Please provide a similar analysis to that contained in Table 1 with the assumption that AMI capability (e.g., time-of-use rates, etc.) is required by 2035. Please provide the complete study/analysis in addition to the summary table.

A. a) Please refer to PUB-NLH-016, Attachment 1 for Newfoundland and Labrador Hydro's ("Hydro") automatic meter reading ("AMR") cost-benefit analysis. Attachment 1 presents a cumulative present worth summary by year for each of the three alternatives (Alterative 1: Manually Read Meters, Alternative 2: Mesh AMI[1] System, and Alternative 3: AMR Drive-by System). For each alternative there is an additional tab which provides further details regarding annual operations and maintenance costs. Attachment 1 also provides a summary table which presents the results of the cumulative net present value for each alternative.

[1] Automated metering infrastructure ("AMI").

The final tab is a chart that provides a visual representation of the comparison of the cumulative net present value for all three alternatives from 2021 to 2041.

b) Hydro performed a high-level overview of the Mesh AMI System to determine the estimated costs for comparison with the other alternatives. Costing was based on Landys & Gyr AMI meters and software. Landys & Gyr was selected as Hydro currently has Landys & Gyr software for its PLX meters. Since Hydro could continue to use this software to support Landys & Gyr AMI meters, it is expected that the Landyx & Gyr AMI mesh system would be the least-cost AMI option for Hydro. For this estimate, Hydro assumed the following configuration:

- 171 sites;
- One AMI router per site;
- A minimum of one repeater per site and an additional repeater for each additional 200 meters (e.g., a site with 800 meters would have 4 repeaters);[2] and
- 28,056 energy-only meters and 3,131 demand and energy meters (31,187 meters total).

Hydro's high-level analysis resulted in an estimated capital cost of approximately $12.4 million, which was materially greater than the $5.4 million for the proposed AMR drive-by meters.

c) Due to the material difference in capital cost between AMI meters and the proposed AMR meters, as well as the reasons identified in part d) of this response, Hydro screened AMI meters from further consideration and did not proceed to technical design of this alternative. As such, Hydro does not have the requested diagram.

d) Hydro does not believe a net present value analysis would provide a reliable basis for adoption of AMI materially in advance of the benefits of such a system becoming clearly demonstrable in serving Hydro Rural customers. Therefore, Hydro has not completed the requested analysis.

[2] The number of repeaters were estimated in consideration of Newfoundland and Labrador's landscape with respect to Hydro's operating locations.

The reasons for Hydro's belief is as follows:

i. Risk of Obsolescence of Metering Technology

Hydro estimates the recommended AMR drive-by technology at 40% lower net present value than the mesh AMI alternative up to 2030, or $5.5 million, as shown in the cumulative net present value summary chart provided in PUB-NLH-016, Attachment 1. Metering technology has advanced materially over the last 15 years. As demonstrated by Hydro's application, power line carrier ("PLC") technology is no longer the norm for metering systems. Hydro purchased the PLC system 14 years ago. As per the cumulative net present value tables and as summarized in Hydro's response to CA-NLH-008 of this proceeding, the capital cost premium to implement the most affordable AMI technology available today is approximately $7.0 million greater than the $5.4 million proposed project. Hydro is concerned that when both risk of obsolescence and non-use of dynamic rates until 2030 or 2035 are considered, the magnitude of required benefits is very unlikely to justify the substantial capital cost disparity.

ii. Uncertainty in System Benefits from Dynamic Rates for Hydro Rural Customers

The Dunsky Conservation and Potential Study prepared for Newfoundland Power Inc. ("Newfoundland Power") and Hydro noted the following key findings:

> 2) **Using a combined residential customer CPP [critical peak pricing] and commercial TOU [time of use] rate design offers significant additional peak load reduction potential, however, this does not fully emerge until after 2030.** Optimizing dynamic rates approaches offers the highest peak load reduction (230 MW in 2034) when combined with a 16-hour curtailment constraint for Corner Brook. However, the ODR [optimized dynamic rates], TOU and CPP programs do not provide sufficient benefits to carry the full cost of the AMI investments needed to enable these programs before 2034. A full business case assessment for AMI may reveal other benefits streams that could be combined with TOU/CPP programs to render the investment cost-effective.[3]

[3] "Application for Approvals Required to Execute Programming Identified in the Electrification, Conservation and Demand Management Plan 2021–2025," Newfoundland and Labrador Hydro, rev. July 8, 2021 (originally filed June 16, 2021), sch. 3, sch. E, at p. 1 of 25 to p. 2 of 25.

3) **Take a stepwise approach to considering new DR [demand response] programs**: Currently there is little additional benefit from new DR programs, including the TOU/CPP programs which do not appear to be cost-effective in the near term. In the initial years, focus should remain on expanding the current commercial and industrial curtailment programs (as per the initial report recommendations) along with expanding the duration of the Corner Brook curtailment event duration. However, as EVs [electric vehicles] become more prevalent in the province, they may eventually contribute to a new evening peak. As this trend takes hold, the Utilities should pilot EV load management strategies (i.e. dynamic rates for customers with EV chargers or direct EV load management). This will help determine which option is most effective at mitigating the impact of EV charging on the utility annual peak, and help ensure that investments in EV adoption return benefit to the system.[4]

In assessing the value of dynamic rates to Hydro Rural customers, it is important to recognize that Newfoundland Power's native peak load comprises approximately 86% of the forecast Island Interconnected System peak demand for the 2021–2022 winter season (1,350 MW) and Hydro Rural peak demand comprises approximately 6% of the forecast Island Interconnected System peak demand for the 2021–2022 winter season (94 MW). Hydro considers the future benefits of dynamic rates to its Hydro Rural customers to be too uncertain to invest an additional $7.0 million at this time.

iii. Limiting Growth in the Rural Deficit

Hydro recognizes that the higher cost investment would contribute to a higher rural deficit to be recovered from the customers of Newfoundland Power and customers on the Labrador Interconnected System for at least the next ten years. Hydro believes that given Newfoundland Power comprises the vast majority of the retail load, it would be appropriate that Newfoundland Power lead in determining the timing of implementing dynamic rates and the transition to AMI for the Island Interconnected System. Hydro believes it should be reluctant to proceed on its own with investing in the higher cost

[4] "Application for Approvals Required to Execute Programming Identified in the Electrification, Conservation and Demand Management Plan 2021–2025," Newfoundland and Labrador Hydro, rev. July 8, 2021 (originally filed June 16, 2021), sch. 3, sch. E, at p. 2 of 25.

AMI system for its Hydro Rural customers well in advance of being certain that that the benefits will exceed the cost of the additional investment.

iv. Conclusion

Given the magnitude of the Newfoundland Power load requirements relative to the load requirements of Hydro Rural interconnected, the uncertainty on the timing and magnitude of benefits of implementing dynamic rates for Hydro Rural customers, the risk of technological obsolescence in selecting a metering system in 2021 for use in implementing dynamic rates post-2030, and the additional $7.0 million in investment required at this time to install AMI infrastructure which would increase the rural deficit for at least the next ten years, Hydro believes it would not be prudent to invest in AMI at this time.

Hydro has chosen the AMR approach to align with Newfoundland Power in implementing the same proven metering technology which will reduce the cost of providing service to its Hydro Rural customers and contribute to a reduction in the rural deficit. Hydro has confidence in the immediate benefits of proceeding with the AMR drive-by system reflected in the net present value analysis summarized in Table 1[5] and provided in PUB-NLH-016, Attachment 1. These include: i) savings in meter reading costs, ii) savings in maintenance costs on the TS1 PLC system, iii) savings in administrative costs associated with a reduction in billing adjustments and dealing with customer inquiries as a result of not being required to estimate customer bills on a regular basis, and iv) savings from not being required to perform Government Retest Orders on the new meters for up to ten years. Hydro also believes the expected improvement in billing integrity will contribute to improved customer satisfaction over the long term and provide a safer work environment for its meter readers.

e) Please refer to part d).

[5] "2022 Capital Budget Application," Newfoundland and Labrador Hydro, rev. September 17, 2021 (originally filed August 2, 2021), vol. II, sch. 8, tab. 15, p. 5, Table 1.