

Office of the Consumer Advocate

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November 14, 2023

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road
P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Jo Galarneau
Executive Director and Board Secretary

Dear Ms. Galarneau:

Re: Newfoundland and Labrador Hydro 2024 Capital Budget Application

On July 12, 2023 Newfoundland and Labrador Hydro ("Hydro") submitted to the Public Utilities Board (the "Board") its 2024 Capital Budget Application. Subsequently, Hydro filed a revised application, dated August 17, 2023, which removed the Purchase of Spare Generator Step-Up Transformer project from the original application, so it could be more expeditiously dealt with as a separate capital expenditure application supplemental to Hydro's approved 2023 Capital Budget Application. That was followed by a second revision on September 21, 2023, in which the Purchase Accommodation Trailers (2024-2025)-Makkovik and Cartwright project was removed from the revised application. That second revision of the application is hereafter referred to as "the Application" or "2024 CBA".

Hydro (Application, paras. 2 and 3) "*proposes \$96.5 million in 2024 expenditures, comprised of the expenditures related to single-year programs and projects proposed for completion in 2024, 2024 expenditures for multi-year proposals commencing in 2024, as well as those expenditures in 2024 related to multi-year programs and projects approved in previous capital budget applications.*" Hydro notes (Application, para. 3) that the Application does not include "*2024 expenditures related to supplemental applications approved by or currently before the Board, or those anticipated to be filed with the Board in 2024 as supplemental applications once a full analysis of the proposed project is complete.*"

Specifically, the Application (para. 12) requests Board approval of Hydro's 2024 capital budget of \$96,452,300 and Hydro's 2024 capital purchases and construction projects in excess of \$750,000.

The Board has directed the parties to make final written submissions on the Application by November 14, 2023. This submission documents the Consumer Advocate's position on Hydro's 2024 CBA.

COMMENTS OF THE CONSUMER ADVOCATE

Having reviewed the Application along with Hydro's responses to two rounds of requests for information from the parties, 136 of which were submitted by the Consumer Advocate's Office, the Consumer Advocate does not take issue with Hydro's requested 2024 capital budget or the projects and programs associated with it. However, as a result of that review process, four points of broader concern stand out and we ask the Board to give them careful consideration. They are enumerated below.

- 1) ***The Need to Finalize the Board’s Provisional Capital Budget Application Guidelines:*** Hydro does not yet have the capability to meet the requirements set out in the Board’s Provisional Capital Budget Application Guidelines. Hydro indicates that it has “*strived*” to meet the spirit and intent of the Provisional Guidelines. As stated in the 2024 Capital Budget Overview (page 5):

“Hydro has continued to strive to comply with the evidentiary requirements set out in the Guidelines, and has strived to meet the spirit and intent of the Guidelines where full adherence is not yet possible. In most instances, Hydro has fully adhered with the Guidelines; however, there are areas where Hydro was unable to provide all of the data requested by the Board, which are discussed herein.”

Hydro is currently assessing means for improving its asset management practices. It is stated (Capital Budget Overview, page 6) *“Hydro continues to improve its asset management systems, with an early emphasis on the implementation of processes to improve and expand on asset and maintenance data. As process improvements are implemented, Hydro anticipates that its asset data will improve and will allow Hydro to address remaining gaps in its evidentiary data supporting its capital programs. Hydro notes that its efforts to improve its asset management systems will continue over the next several years, consistent with the timeframes Hydro has observed for other Canadian utilities who have or are in the process of improving their asset management systems.”*

In this regard, Hydro submitted an October 20, 2023 report to the Board titled (PUB-NLH-065) *Asset Management Needs and Readiness Assessment* by Greeman Asset Management Solutions. Newfoundland Power has likewise embarked on a review of its asset management practices. In CA-NP-012 (pertaining to NP’s 2024 Capital Budget Application) it is stated *“Newfoundland Power is currently undertaking a review of its asset management practices to ensure its practices continue to be adequate, given the age of its electrical system, and remain consistent with industry best practices.”* Therefore, reviews of asset management practices by both utilities are well underway. As Hydro states (Capital Budget Overview, page 5) *“Hydro acknowledges that process is ongoing regarding revisions to the Guidelines based on recent feedback from the utilities and regulatory stakeholders, and welcomes further discussion on this matter before the finalization of the Guidelines in future.”*

The Consumer Advocate likewise welcomes further discussion in an effort to finalize the Capital Budget Application Guidelines to better inform these asset management reviews before they move further along in development. The Capital Budget Application Guidelines must be finalized to ensure benefits to consumers are maximized and that changes in asset management practices are consistent with changes going on in the industry and best practices emerging in other provinces.

- 2) ***The Need for Hydro to Improve Project Execution:*** In Hydro’s *Capital Expenditures and Carryover Report for the Year Ended December 31, 2022* (page 2) it is stated *“Hydro will carryover approximately \$40.0 million of work into 2023 and beyond.”* While Hydro lists a number of reasons for this very high level of capital expenditure carryover, carryovers have occurred in each of the past 10 years since 2013, and in 8 of those years, carryovers as a percentage of the approved budget were in double digits (CA-NLH-132). This is concerning at a time when there is significant uncertainty relating to the province’s electricity supply as noted in documents associated with Hydro’s Reliability and Resource Adequacy Study such as: the reliability of Muskrat Falls generation and the LIL, the reliability of Holyrood TGS as a backup source of supply, electricity demand which could increase substantially in light of government net-zero carbon efforts, and forecast generation capacity shortfalls. In light of these uncertainties, it is of vital importance that existing assets be maintained to ensure reliable performance going forward.

Any uncertainty with respect to the security and reliability of supply is troubling. In the Board's September 29, 2016 report titled *In the Matter of an Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System, Phase One Report* states (page iii) "*Despite the progress that has been made throughout this investigation the Board believes that there are continuing serious risks to the adequacy and reliability of supply on the Island Interconnected system. The primary ongoing concerns relate to Hydro's transmission asset management execution, operating culture, generation planning and supply, and generation asset management.*" The Consumer Advocate is concerned that Hydro's asset management practices and execution continue to be problematic. The Board is urged to encourage Hydro to address project execution issues to ensure certainty of supply for customers.

- 3) ***The Need for an Overall Plan for Bay d'Espoir Refurbishment:*** There are several projects identified in the 2024 Capital Budget Application that relate to the Bay d'Espoir Hydroelectric Generating Facility.¹ Yet there is no overall asset management plan for the refurbishment of this facility. In PUB-NLH-078, Hydro is asked:

"Further to the response to PUB-NLH-060, please explain whether Hydro's approach of looking at individual components of a large hydro generating facility when considering the need for capital work and not completing an overall condition assessment for a significant generating facility is consistent with Canadian utility practice. In Hydro's opinion would an overall condition assessment of the Bay d'Espoir plant ever be required?"

Hydro's response follows:

"It is Hydro's position that an overall condition assessment of the Bay d'Espoir Hydroelectric Generating Facility would produce generalized results which could not be applied with precision to each physical asset. The Bay d'Espoir hydroelectric units are operated in a non-uniform manner based on a number of factors, including but not limited to, asset health monitoring, station service supply, and Island generation requirements. The level of detail required to make asset management decisions on the Bay d'Espoir fleet cannot be provided in an overall condition assessment unless individual detailed assessments for each physical asset were carried out, considering asset specific criteria and data. Hydro believes its current approach to identify and execute condition assessments is the most effective and efficient approach for its capital planning process."

This is confusing. If Hydro is concerned that an overall condition assessment would produce "*generalized results*", then it should conduct the condition assessment in a "*detailed*", rather than a "*generalized*" manner, and include in the condition assessment "*detailed assessments for each physical asset*". How can the parties and the Board, and Hydro for that matter, determine if it makes sense to approve an individual component of a project at the Bay d'Espoir plant if they do not know where, how and to what extent the project impacts other components of the plant? The parties have no way of knowing if Bay d'Espoir, a critical component of the supply to the Island Interconnected System, can be relied upon to provide reliable supply to Island customers without the need for yet another project to refurbish an individual component of the plant potentially taking it out of service during the critical

¹ See 2024 Capital Budget Overview, Appendix A which lists the following projects at Bay d'Espoir: Water System Condition Assessment and Upgrades (2023), Replace Annunciator - Phase 2 (2024-2025), Replace Powerhouse 1 Air Conditioning Unit (2024-2025), Replace Powerhouse 1 Roof (2024-2025), Refurbish Surge Tank 1 (2024-2025), and Refurbish Intake 1 (2024-2025). The total cost of these Bay d'Espoir projects is about \$9.0 million.

winter peak supply period. Without an overall plan for Bay d’Espoir, the parties and the Board cannot possibly know if it makes economic sense to continue to refurbish the plant, or embark on an option to replace the capacity and energy supply from the plant.

In short, an overall condition assessment and assessments of individual components are not mutually exclusive; they are complementary.

4) ***The Need for an Understanding of How to Manage the Variability and Non-Dispatchability of Renewable Generation Sources:*** The question posed in CA-NLH-I21 is:

“It is stated “in the absence of a suitable energy storage system, large-scale, non-dispatchable resources such as these have limited viability on Hydro’s bulk electrical system.” However, the U.S. Energy Information Administration (EIA) states “In 2022, generation from renewable sources—wind, solar, hydro, biomass, and geothermal—surpassed coal-fired generation in the electric power sector for the first time.” The EIA goes on to say “Utility-scale solar capacity in the U.S. electric power sector increased from 61 gigawatts (GW) in 2021 to 71 GW in 2022, according to data from our Electricity Power Monthly.” How are these jurisdictions combining non-dispatchable resources with other generation and ancillary service resources to compensate for production variability and non-dispatchability?”

Hydro’s response is:

“Newfoundland and Labrador Hydro does not have the information necessary to comment on how other jurisdictions, either in Canada or in the United States of America, plan on combining non-dispatchable resources with other generation resources.”

That response is problematic. How is Hydro conducting a Reliability and Resource Adequacy Study, particularly in light of government net-zero carbon efforts, without such information? How can Hydro say that it is complying with the Electrical Power Control Act, 1994, which requires that power be delivered to customers at the lowest possible cost, in an environmentally responsible manner, consistent with reliable service, without such information? The resources used to compensate for production variability and non-dispatchability of renewable resources may be viable alternatives to some of the projects included in the 2024 Capital Budget Application particularly in light of environmental requirements associated with government net-zero carbon efforts and the Act. Consider the chapter from The Palgrave Handbook of International Energy Economics titled *Integration of Non-Dispatchable Renewables*, first online May 28, 2022, by Marco Baroni.² The chapter lists four main integration options for non-dispatchable resources, namely:

- Flexibility of power plants
- Energy Storage
- Demand-side response
- Transmission and distribution grids and interconnections.

Baroni notes that wind and solar technologies can contribute to their own integration as well.

² https://link.springer.com/chapter/10.1007/978-3-030-86884-0_16

Baroni makes a number of points relevant to the integration of non-dispatchable generation sources such as wind and solar. Those points are applicable to NL and are highlighted by the following quotes.

“The highest share of combined generation of wind and solar PV in the world on average in 2018 was reached in Denmark, where about 50% of total annual generation came from non-dispatchable sources, primarily wind (IEA Statistics 2020). This high level was reached thanks to several factors, with high levels of interconnection with the neighbouring countries playing a primary role.”

“While solar PV [photovoltaic] is still limited as a share of total generation, with only California passing the double-digit share (at around 14%) and Italy ranking second in the world at around 8%, several countries have surpassed the 15% threshold of wind share in their power mix, with some even exceeding the 30% threshold. This is the case for several States in the centre of the United States (EIA 2020) (with a high quality of wind resources), while several countries in Europe produced more than 20% of their mix from wind and solar PV combined (e.g. Ireland, Germany, Spain, the United Kingdom), and a similar level is being approached in other areas in Asia, such as in the Inner Mongolia province in China.”

“Battery storage—the majority of which are lithium-ion—has been soaring over the last few years, to reach about 8 GW in 2018. About 60% of the total installed capacity has been added in the last two years, showing how a combination of policies (targets and subsidy schemes) and costs reductions can support technology deployment. Over 60% of the 3 GW added in 2018 were for batteries behind the meter, and the rest for utility-scale (IEA 2019d). These two market segments hold very large potential for further development.”

“Today, the flexibility of power systems is mostly provided by power plants, with a smaller role for interconnectors. At global level, battery and interruptible industrial customers still play a marginal role (IEA 2018). Hydropower plants with reservoir storage often provide the greatest flexibility at least cost.”

Therefore, hydropower plants with reservoir storage such as Muskrat Falls and Bay d’Espoir can provide the greatest flexibility at least cost, and Hydro now has access to transmission interconnection capacity with other jurisdictions through the LIL and the Maritime Link. Further, Hydro has interruptible power contracts with Island Industrial Customers and customer-owned battery storage is expected to increase substantially in the coming years with the increasing adoption of electric vehicles in the province. Therefore, Hydro is well positioned to add increasing amounts of non-dispatchable generation to its power system.

In addition, Baroni points to the rise of “prosumers” and the implications for electricity systems. He writes:

“While the new wind and solar PV utility-scale projects fit more into this path, the deployment of commercial and residential scale plants are increasing substantially the number of power producers from few dozens to thousands or millions.”

“These producers are often connected to mid- or low-voltage levels grids (distribution grids), generally closer to demand centres, and are often consumers of electricity themselves. This new category of “prosumers” (producers and consumers of electricity) is actually not new.”

“The main change introduced by prosumers is their number, scale and diffusion. This is already having an important impact on transmission and distribution grids, and is expected to change the way that transmission system operators (TSO) and distribution system operators (DSO) function and interact, including the possibility for DSOs to provide flexibility services to the system through the aggregation of small active actors (TSO–DSO 2019).”

Thus, the advent of “*prosumers*” is another phenomenon that could significantly impact capital projects on the transmission and distribution systems of both Hydro and Newfoundland Power, particularly if the number of electric vehicles in the province with bidirectional charging increases. Electric vehicles with bidirectional charging can provide power to the grid when needed (see CA-NP-170 pertaining to Newfoundland Power’s 2024 CBA).

Hydro’s statement (CA-NLH-011c) that “*in the absence of a suitable energy storage system, large-scale, non-dispatchable resources such as these have limited viability on Hydro’s bulk electrical system*” ignores the transition that is taking place around the world. The province would benefit from a pilot on environmentally-friendly non-wires alternatives, behind-the-meter generation and the future role of “*prosumers*” to inform future distribution planning activities and capital budget applications. The government’s net-zero carbon emissions policy is likely to make customer-owned generation and battery storage economically viable options as fossil fuels are ruled out as potential supply options. Further, as noted earlier, considerable uncertainty in the reliability of supply to the Island Interconnected System is likely to increase customer interest in customer-owned generation and battery storage.

SUMMARY

The Consumer Advocate does not take issue with Hydro’s request for approval of \$96,452,300 in 2024 expenditures for the projects identified in its Application. However, there are broad issues arising from the review of the Application that are concerning. In that regard, the Board ought to:

- 1) finalize the Provisional Capital Budget Application Guidelines including a plan directing the utilities to meet the requirements in a timely manner;
- 2) direct Hydro to file a plan to clear the huge backlog of project carryovers stemming from its capital budget applications;
- 3) direct Hydro to undertake a detailed asset management plan for the refurbishment of the Bay d’Espoir hydropower plant, a critical element to the reliable supply of power to the Island Interconnected System; and
- 4) direct Hydro and/or Newfoundland Power to gain a better understanding of the integration of non-dispatchable resources, non-wires alternatives, behind-the-meter generation and the role of “*prosumers*” in meeting the future electricity needs of the province consistent with government net-zero carbon initiatives and the environmental requirements set out in the Electrical Power Control Act, 1994.

It is the Consumer Advocate’s view that now is the opportune and crucial time for providing consumers with greater control over their electricity consumption characteristics and their energy expenditures to benefit not only themselves, but also the provincial energy supply system. An ambitious timeline is needed

for leveraging the “*prosumer*” concept including the implementation of time-varying rates together with the requisite metering. Embracing the “*prosumer*” concept will ensure effective and efficient use of existing energy infrastructure before embarking on rebuilds and new wires ventures. This approach is necessary if government net-zero carbon efforts and the environmental requirements set out in provincial legislation are to be met in a timely fashion.

Please contact the undersigned if you have any questions on this submission.

Yours truly,



Stephen Fitzgerald, KC
Counsel to the Consumer Advocate

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