Public Utilities Board
NEWFOUNDLAND & LABRADOR
120 Torbay Road • Prince Charles Building, Suite E210 • St. John's, Newfoundland and Labrador • A1A 2G8

E-mail: shirleywalsh@nlh.nl.ca

2024-11-08

Ms. Shirley Walsh
Senior Legal Counsel, Regulatory
Newfoundland and Labrador Hydro
P.O. Box 12400
Hydro Place, Columbus Drive
St. John's, NL A1B 4K7

Dear Ms. Walsh:

Re: Newfoundland and Labrador Hydro - Reliability and Resource Adequacy Study Review - To NLH - Requests for Information

Enclosed are Requests for Information PUB-NLH-324 to PUB-NLH-340 regarding the above-noted application.

If you have any questions, please do not hesitate to contact the Board's counsel, Ms. Maureen Greene, KC, by email mgreene@pub.nl.ca or telephone (709)726-3175.

Sincerely,

Jo-Anne Galarneau
Board Secretary

JG/cj
Enclosure

ecc **Newfoundland and Labrador Hydro**
NLH Regulatory, E-mail: NLHRegulatory@nlh.nl.ca
Newfoundland Power Inc.
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Senwung Luk, E-mail: sluk@oktlaw.com
Nick Kennedy, E-mail: nkennedy@oktlaw.com

IN THE MATTER OF
the **Electrical Power Control Act, 1994**,
SNL 1994, Chapter E-5.1 (the "**EPCA**")
and the **Public Utilities Act**, RSNL 1990,
Chapter P-47 (the "**Act**"), as amended, and
regulations thereunder; and

IN THE MATTER OF Newfoundland and
Labrador Hydro's Reliability and Supply
Adequacy Study.

PUBLIC UTILITIES BOARD
REQUESTS FOR INFORMATION

PUB-NLH-324 to PUB-NLH-340
Issued: November 8, 2024

Newfoundland and Labrador Hydro - 2024 Resource Adequacy Plan, Filed July 9, 2024

PUB-NLH-324 Please refer to Hydro's "2024 Resource Adequacy Plan: Technical Conference #4: Expansion Plan, Insights, and Next Steps," dated October 29, 2024, at slide 33. For each "model run" and "sensitivity" identified on this slide, please provide the data listed below for all assets available to PLEXOS (including existing Hydro assets by generating unit and potential expansion assets). Please provide the data in Excel format, with all units of measurement clearly indicated, for the entire study period.

a. Capacity (MW) (by season, if applicable)
b. Firm Capacity (MW)
c. Maximum Generation (MW)
d. Minimum Stable Generation (MW)
e. Heat rate (GJ/MWh or MMBtu/MWh)
f. Minimum up time
g. Minimum down time
h. Failure parameters (such as rate, frequency)
i. Maintenance parameters (such as rate, frequency)
j. Ramp rate (MW/minute)
k. Hourly dependable capacity shape (by season, if applicable, such as for wind resources[1])
l. Capital cost
m. Sustaining capital cost ($/year)
n. Variable O&M cost ($/MWh)
o. Fixed O&M cost ($/MW or $/kW)
p. Marginal loss factor (%)
q. Retirement/decommissioning cost ($)
r. Terminal/salvage value ($)
s. Asset life (years/date)
t. Fuel type
u. Fuel cost (by year)
v. Marginal cost ($/MWh)
w. Start-up costs ($/start) (please distinguish between hot/warm/cold starts, if applicable)
x. Cycling costs
y. Emissions rates
z. Emissions costs
aa. Round trip efficiency (for battery energy storage projects)
bb. Duration (for battery energy storage projects)

[1] See 2024 Resource Adequacy Plan, Filed July 9, 2024, Appendix B, page 31 of 57, lines 17 to 19.

PUB-NLH-325 Please refer to Hydro's "2024 Resource Adequacy Plan: Technical Conference #4: Expansion Plan, Insights, and Next Steps," dated October 29, 2024, at slide 33. For each "model run" and "sensitivity" identified on this slide, and with all units of measurement clearly indicated, please provide for all assets available to PLEXOS (including existing Hydro assets and potential expansion assets) and in Excel format, for the entire study period:

a. Total installed capacity, by year
b. Selected resources' MW, by year
c. Annual generation (GWh, by year)
d. Annual fuel burn (Btu, by year)
e. Capacity factor (by year)
f. Availability factor (by year)
g. Average duration (hours)
h. Fixed costs (by year)
i. Variable costs (by year)
j. Forced outage hours (by year)
k. Planned outage hours (by year)
l. Maintenance outage hours (by year)
m. Hourly operating reserve contributions (by reserve product, e.g., 30-minute and 10-minute reserves, regulating reserves, etc.)

PUB-NLH-326 Please refer to Hydro's "2024 Resource Adequacy Plan: Technical Conference #4: Expansion Plan, Insights, and Next Steps," dated October 29, 2024, at slide 33. For each "model run" and "sensitivity" identified on this slide, and with all units of measurement clearly indicated, please provide in Excel format and for the entire study period:

a. Loss of Load Hours (by year)
b. Loss of Load Expectation (by year)
c. Expected Unserved Energy (by year)
d. Overgeneration (by year)
e. Curtailed energy (by year)
f. Hourly operating reserves (by reserve product, e.g., 30-minute and 10-minute reserves, regulating reserves, etc.)
g. Hourly operating reserve requirements (by reserve product, e.g., 30-minute and 10-minute reserves, regulating reserves, etc.)
h. Total Fixed Cost (by year)
i. Total Operating/Variable Cost (by year)
j. Total Cost (by year)
k. NPV Total Cost (by year)
l. Incremental transmission expansion costs (by year)
m. Reserve Margin (by year)
n. Planning horizon (years)
o. Hourly load shapes
p. Years modeled (including identification of representative years)

q. Fuel price forecasts
r. Transmission constraints
s. LIL hourly available capacity (MW)
t. LIL hourly flows (MW)
u. Transmission losses
v. Hourly imports (via Quebec)
w. Hourly imports (via Nova Scotia)
x. Hourly exports (via Quebec)
y. Hourly exports (via Nova Scotia) (as broken down between Nova Scotia Block Energy, Energy Access Agreement Energy, and other bilateral transactions)
z. Spillage (by year)
aa. Fuel burn off volumes
bb. Fuel burn off costs

PUB-NLH-327 With respect to model results related to reliability statistics – i.e., loss-of-load hours, loss-of-load-expectation, and unserved energy – and considering the fact that system commitment and dispatch simulations typically report quantities of unserved energy that may not reflect any reliability deficiency, but rather inherent limitations of the simulation:

a. Please describe how such reliability-related statistics are extracted or derived from model outputs.
b. Does Hydro monitor or benchmark such reliability-related model outputs against expectations? For example, our understanding is that a 2.8 LOLH target is used to derive a planning reserve margin that is then incorporated in the system modeling. Does Hydro evaluate whether loss of load hours explicit or implicit in the system model outputs correspond appropriately to the 2.8 LOLH target?
c. Does Hydro consider there to be a base level of unserved energy inherent to model limitations, with higher levels relevant to true reliability issues? Please explain.

PUB-NLH-328 Please refer to the Resource Adequacy Plan, Appendix C, Section 3.0. For the firm energy analysis, please provide, in Excel format:

a. All model outputs/results
b. All model assumptions
c. All model inputs
d. Hourly firm energy demand
e. Hourly firm energy supply
f. Hourly firm energy, by supply resource
g. Hourly energy profile, by supply resource, if different from (f)
h. Hourly firm energy of the LIL
i. Hourly energy profile of the LIL, if different from (h)
j. Hourly firm energy imports

k. Hourly firm energy exports
l. Hourly
m. Spillage (hourly, if available; otherwise, by year)
n. Hourly wind curtailments
o. Time horizon of study period
p. Transmission losses
q. Generation forced outage rates

PUB-NLH-329 Please refer to Resource Adequacy Plan Filing, Appendix B, page 15 of 57, line 6. Please provide for the Transmission Model, in Excel format:
a. Inputs
b. Assumptions
c. Outputs/Results

PUB-NLH-330 Please refer to Resource Adequacy Plan Filing, Appendix B, page 15 of 57, lines 7-8. Please provide for the Long-Term Financial Model, in Excel format:
a. Inputs
b. Assumptions
c. Outputs/Results

PUB-NLH-331 Please confirm that battery energy storage is selected in all capacity expansion model runs where its assumed ELCC is 60% or greater. If not confirmed, please explain.

PUB-NLH-332 Please explain in detail why Hydro decided to pursue at this time the Minimum Investment Required Expansion Plan as defined in the 2024 Resource Adequacy Plan rather than the Reference Plan.

PUB-NLH-333 Please explain in detail what the implications of the supply options recommended in the Minimum Investment Required Expansion Plan are for potential supply options in the Reference Plan and how selection of the Minimum Investment Required Expansion Plan supply options impacts the selection and timing of supply options in the Reference Plan.

PUB-NLH-334 Please explain in detail the actions that Hydro is taking to ensure readiness to pursue the Reference Plan expansion requirements and how it will monitor and evaluate the need for and timing of additional generation requirements assuming the approval by the Board of the Minimum Investment Required Expansion Plan. In the response provide a schedule that lists all key activities and expected completion dates, including the date for the next update to the Resource Adequacy Plan.

PUB-NLH-335 Please list all ongoing and planned studies and analyses Hydro is undertaking or will undertake to support its applications for approval of supply options for the

Minimum Investment Required Expansion Plan and the Reference Case. In the response describe the scope of work for each study and analysis and the expected date for completion.

PUB-NLH-336 Please state the expected filing date for the application for approval of the supply options recommended in the Minimum Investment Required Expansion Plan.

PUB-NLH-337 One of the assumptions underlying Hydro's system planning criteria and methodology for the Minimum Investment Required Expansion Plan is an Equivalent Forced Outage Rate of 1% for the Labrador Island Link. Please explain how this assumption was selected and the implications for reliability and resource adequacy for the Island Interconnected system if the actual outage rate is higher or lower.

PUB-NLH-338 Please refer to Hydro's 2024 Resource Adequacy Plan: Technical Conference #1: Load Forecast/Reliability Planning Criteria, dated September 17, 2024 at slide 55. Please explain how in the LIL shortfall assessment Hydro determined the level of customer interruption that it considers appropriate and how such interruption would be managed.

PUB-NLH-339 Please explain why a battery energy storage system has been excluded as a potential supply option for the Minimum Investment Required Expansion Plan.

PUB-NLH-340 Please explain any fuel supply constraints that may arise with respect to the selection of a combustion turbine (CT) as a supply option and how Hydro satisfied itself that fuel supply is not an impediment to the selection of a 150 MW CT in the Minimum Investment Required Expansion Plan.

DATED at St. John's, Newfoundland and Labrador, this 8th day of November 2024.

BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

Per

Jo-Anne Galarneau
Board Secretary