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June 17, 2024

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

Attention: Jo-Anne Galarneau
Executive Director and Board Secretary

Re: Monthly Energy Supply Report for the Island Interconnected System for May 2024

Enclosed please find Newfoundland and Labrador Hydro's Monthly Energy Supply Report for the Island Interconnected System as directed by the Board of Commissioners of Public Utilities.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/rr

Encl.

ecc:

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Monthly Energy Supply Report for the Island Interconnected System for May 2024

June 17, 2024

A report to the Board of Commissioners of Public Utilities



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1.0 Introduction

On February 8, 2016, the Board of Commissioners of Public Utilities (“Board”) requested Newfoundland and Labrador Hydro (“Hydro”) file a biweekly report containing, but not limited to, the following:

- 1) System Hydrology Report;
- 2) The thermal plant operated in support of hydrology;
- 3) Production by plant/unit; and
- 4) Details of any current or anticipated long-term derating.

In July 2016, the Board indicated that a monthly report would thereafter be sufficient. This report provides data for May 2024.¹

2.0 System Hydrology

Reservoir inflows in May 2024 were 46% below the month’s historical average.² Table 1 summarizes the aggregate storage position of Hydro’s reservoirs at the end of the reporting period.

Table 1: System Hydrology Storage Levels

| Date | 2024 (GWh) | 2023 (GWh) | 20-Year Average (GWh) | Minimum Storage Limit (GWh) | Maximum Operating Level (GWh) | Maximum Operating Level (%) |
|-------------|---------------|---------------|-----------------------------|-----------------------------------|--|--------------------------------------|
| 31-May-2024 | 2,287 | 1,842 | 2112 | 1,729 | 2,586 | 88 |

The aggregate reservoir storage level on May 31, 2024 was 2,287 GWh, which is 12% below the seasonal maximum operating level and 32% above the minimum storage limit.³ Inflows to the reservoirs of the Bay d’Espoir Generation System (“Bay d’Espoir System”) were 47% of average during May 2024. Inflows

¹ Effective April 2023, Hydro added Section 2.1 (Ponding), Section 2.2 (Spill Activity), and Appendix A (Ponding and Spill Transactions) within this report. “Newfoundland and Labrador Hydro – Streamlining of Quarterly Regulatory Report to Parties – Board’s Decision on Reporting,” Board of Commissioners of Public Utilities, May 11, 2023.

² Calculated in terms of energy (gigawatt hour [“GWh”]).

³ Minimum storage limits are developed annually to provide guidance in the reliable operation of Hydro’s major reservoirs—Victoria, Meelpaeg, Long Pond, Cat Arm, and Hinds Lake. The minimum storage limit is designed to indicate the minimum level of aggregate storage required such that if there was a repeat of Hydro’s critical dry sequence, or other less severe sequence, Hydro’s load can still be met through the use of the available hydraulic storage supplemented with maximized deliveries of power from the Muskrat Falls Hydroelectric Generating Facility over the Labrador-Island Link (“LIL”). Hydro’s long-term critical dry sequence is defined as January 1959 to March 1962 (39 months). Other dry periods are also considered during this analysis to ensure that no other shorter-term historic dry sequence could result in insufficient storage.

1 to the Hinds Lake Reservoir were 43% of average, and inflows to the Cat Arm Reservoir were 80% of
2 average. Weather conditions across the Island reservoirs in May 2024 were mild with some periods of
3 rain throughout the month, however maximum single day precipitation amounts were only in the 15–25
4 mm range. Increased inflows due to spring runoff from remaining snow melt in the Cat Arm Reservoir
5 also concluded in May 2024.

6 Bay d’Espoir Units 5 and 6 were offline at the start of May on planned annual outages, which began on
7 April 28, 2024. Bay d’Espoir Unit 5 returned to service on May 25, 2024, and Unit 6 was returned to
8 service on May 30, 2024. Bay d’Espoir Unit 3 was taken offline on a brief planned outage starting and
9 ending on May 8, 2024. Cat Arm Unit 1 was taken offline May 13, 2024 for a planned outage, with the
10 unit returning to service on May 15, 2024. Bay d’Espoir Unit 1 was taken offline on a brief planned
11 outage starting and ending on May 14, 2024. Bay d’Espoir Unit 2 was taken offline on a brief planned
12 outage starting and ending May 16, 2024, with the unit returning to service later that same day. Bay
13 d’Espoir Units 1 and 2 were also taken offline on May 20, 2024. Unit 1 remained offline for the
14 remainder of May on a planned outage while Unit 2 returned to service later the same day. Cat Arm
15 Units 1 and 2 were both offline on May 24, 2024 on a forced outage as a result of lightning strikes in the
16 area, with Unit 1 returning the same day and Unit 2 returning May 25, 2024. Cat Arm unit 1 was also de-
17 rated to 30 MW starting on May 26, 2024 due to a spherical valve pit water level alarm. The de-rated
18 capacity was increased to 60 MW on May 27, 2024, where it remained for the rest of the month.

19 Figure 1 plots the 2023 and 2024 storage levels, minimum storage limits, maximum operating level
20 storage, and 20-year average aggregate storage for comparison. In addition to the 2023–2024 limits
21 presented in Figure 1, Hydro has established the minimum storage limits to April 30, 2025. The 2024–
22 2025 limits were developed considering maximized delivery of power from the Muskrat Falls Facility,
23 supplemented by available Recapture Energy from the Churchill Falls Generating Station over the LIL
24 utilizing the transmission limits associated with the >58.0 Hz under-frequency load shedding scheme.⁴

⁴ The 2024–2025 analysis assumed that only two units at the Holyrood TGS would be online and operating at minimum load during the winter 2024–2025 period. All three units at the Holyrood TGS are planned to be available at full capability, if needed. The minimum storage methodology was updated to ensure Hydro’s reservoirs could continue to provide reliable service to customers at the lowest possible cost, in an environmentally responsible manner. In this context, Island reservoirs are expected to be supported with Muskrat Falls energy instead of thermal energy from the Holyrood TGS.

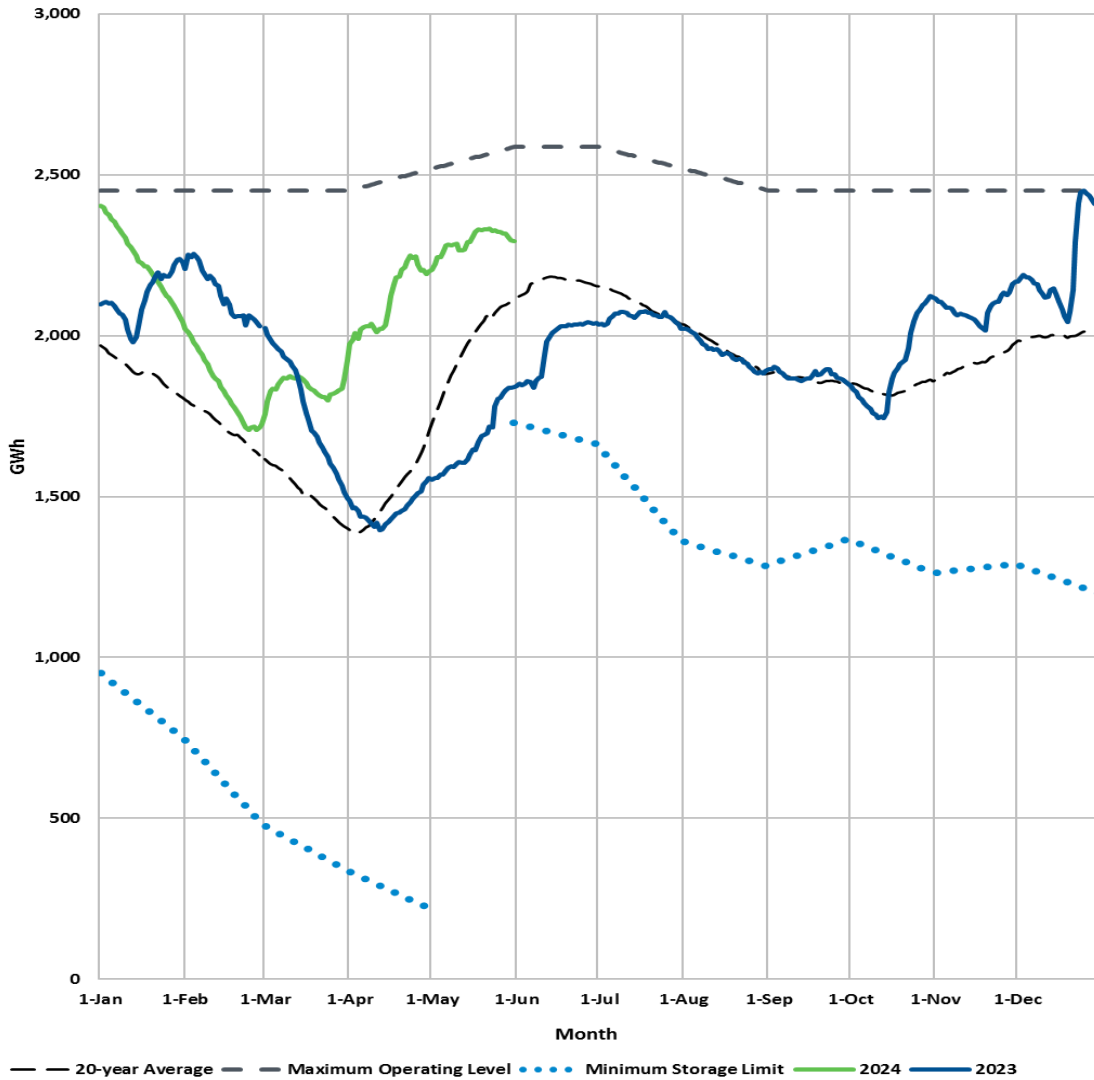


Figure 1: Total System Energy Storage⁵

1 **2.1 Ponding**

2 In Order No. P.U. 49(2018), the Board approved Hydro’s application for approval of a Pilot Agreement
 3 for the Optimization of Hydraulic Resources (“Pilot Agreement”).⁶ The intent of the Pilot Agreement is to
 4 optimize Hydro’s hydraulic resources through the strategic use of its storage capabilities, taking
 5 advantage of the variability of energy pricing in external markets over time.

⁵ Data points in Figure 1 represent storage at the beginning of each day. Table 1 reports the end-of-day storage values, which results in a small difference between the storage data presented in Table 1 and Figure 1.

⁶ The Third Amended and Restated Pilot Agreement for the Optimization of Hydraulic Resources was approved as per Board Order No. P.U. 35(2022), and was extended as per Board Order No. P.U. 30(2023).

1 Appendix A provides information regarding imported and exported energy transactions under the Pilot
 2 Agreement during the month. Pondering exports over the Maritime Link occurred during May 2024 and
 3 are summarized in Appendix A.

4 **2.2 Spill Activity**

5 There were no releases of water required at any locations on the Island Interconnected System in May
 6 2024. A summary of the year-to-date (“YTD”) total volumes spilled or bypassed in both MCM⁷ and GWh
 7 can be found in Table 2. In order to mitigate the potential for spill from the Cat Arm Reservoir in May
 8 2024, spill avoidance exports from the Cat Arm Hydroelectric Generating Facility were permitted from
 9 May 1, 2024 until May 30, 2024 to ensure that generation was maximized to the extent possible.

10 Appendix A provides information regarding spill-avoidance export transactions undertaken during the
 11 month.⁸

Table 2: Spill Activity⁹

| | Granite Canal Bypass | | Upper Salmon Bypass | | Burnt Dam Spillway | |
|------------------|----------------------|------------|---------------------|------------|--------------------|-------------|
| | MCM | GWh | MCM | GWh | MCM | GWh |
| 31-May-2024 | - | - | - | - | - | - |
| YTD Total | 5.9 | 0.6 | 3.9 | 0.5 | 21.0 | 13.8 |

⁷ Million cubic metres (“MCM”).

⁸ Pursuant to the Pilot Agreement, exporting when system load is low allows for increased generation from Island hydraulic facilities and the utilization of water (energy) that would have otherwise been spilled, while not increasing the risk of spill elsewhere in the system.

⁹ Numbers may not add due to rounding.

3.0 Production and Purchases

Appendix B provides a breakdown of power purchases, including the import and export activity over the LIL and Maritime Link and production by plant during May 2024. Deliveries made in May 2024, under the power purchase agreement with Corner Brook Pulp and Paper Limited (“CBPP”), are also outlined in Appendix B.¹⁰ There was no energy repaid from CBPP to Energy Marketing under the Temporary Energy Exchange Agreement in May 2024. Emergency energy¹¹ was not supplied to Nova Scotia over the Maritime Link during May 2024.

4.0 Thermal Production

Units 2¹² and 3 at the Holyrood Thermal Generating Station (“Holyrood TGS”) were online for system generation requirements during May 2024. Total energy production from the Holyrood TGS was 33.5 GWh during the month. The operating hours for the Holyrood TGS and the Hardwoods, Stephenville, and Holyrood Gas Turbines are summarized in Table 3. Standby generation was not required to support reservoir storage.

Table 3: Holyrood TGS and Gas Turbines Operating Hours

| | Operating Hours | Synch Condense Hours | Available Hours |
|---------------------|-----------------|----------------------|-----------------|
| Holyrood TGS | | | |
| Unit 1 | 0.0 | 0.0 | 0.0 |
| Unit 2 | 208.7 | 0 | 382.1 |
| Unit 3 | 305.1 | 0 | 612.0 |
| Gas Turbines | | | |
| Hardwoods | 4.0 | 569.2 | 573.2 |
| Stephenville | 0.0 | 0.0 | 0.0 |
| Holyrood | 4.4 | 0.0 | 685.9 |

¹⁰ On February 1, 2024, Hydro entered into a six-month power purchase agreement with CBPP as per a directive from the Government of Newfoundland and Labrador on January 22, 2024, in Order in Council No. OC2024-013. The power purchase agreement with CBPP provides Hydro with 80 GWh of non-firm energy from February 1, 2024, through July 31, 2024, inclusive.

¹¹ Under the Interconnection Operators Agreement between Hydro and Nova Scotia Power.

¹² Holyrood TGS Unit 2 was released for normal operation on May 17, 2024. Hours noted in Table 3 include hours prior to release for service operating under testing/monitoring conditions. Additional details can be found in Section 5.0.

5.0 Unit Deratings

Holyrood TGS Unit 1 was taken offline for the planned annual outage on April 12, 2024. It remained on planned outage for the entire month of May 2024.

Unit 2 at the Holyrood TGS was returned to service on May 16, 2024, to collect operating data to continue online commissioning of the new controls system and the new last stage blades that had been installed on the turbine. After data collection, the unit was removed from service again on May 17, 2024 and commissioning activities continued offline. The unit was returned to service for operation on May 23, 2024, however was de-rated to 85 MW due to a failure of a bearing in the west boiler feed pump motor. Later that same day, the west boiler feed pump motor was replaced with a spare and Unit 2 was available for full capability. The unit remained online to allow operation at various loads to further test the unit. On May 27, 2024 a failure of steam packing in the east temperature control valve de-rated the unit output to 70 MW for approximately 24 hours. The packing was replaced on May 28, 2024 restoring unit capability. After completion of testing, and because the unit was no longer required to support system generation requirements, the unit was removed from service on May 30, 2024 and remained on standby for the remainder of May 2024.

At the beginning of May, 2024 Unit 3 at the Holyrood TGS was online and operating with full capability. On May 13, 2024 it was removed from service and placed in standby as it was not required to support system generation requirements. On May 26, 2024, the unit began its planned annual outage.

The Hardwoods Gas Turbine was available for the entire month of May 2024 with the exception of a planned outage from May 13, 2024, and May 20, 2024, to complete preventative maintenance activities.

The Holyrood Gas Turbine was available for the full month of May 2024 with the exception of a planned outage from April 22, 2024 to May 3, 2024, to complete preventative maintenance activities.

The Stephenville Gas Turbine remained unavailable during May 2024 due to damage to the generator resulting from the failure of a generator cooling fan. After inspection and testing at the original equipment manufacturer (“OEM”) facility in the United States in December 2023, the rotor was returned to the site in February 2024 and reinstalled in the unit on March 5, 2024. The exciter was received back from OEM’s facility on May 10, 2024. The contractor mobilized to the site on May 6, 2024, and began reassembly activities. The exciter has been reinstalled and the current onsite focus is the realignment of the unit powertrain. It is expected that the unit will return to service late July 2024.

Appendix A

Ponding and Spill Transactions



Table A-1: Ponding Transactions¹

| Date | Ponding Imports (MWh) | Ponding Exports (MWh) | Ponding Imports Purchased by Hydro (MWh) | Transfer of Pond Balance to Spill Avoidance (MWh) | Energy Losses to Export (MWh) | Cumulative Pondered Energy (MWh) |
|--------------------------|-----------------------|-----------------------|--|---|-------------------------------|----------------------------------|
| Opening Balance | | | | | | (130) |
| 2-May-2024 | | 98 | | | 10 | (238) |
| 3-May-2024 | | 378 | | | 36 | (652) |
| 21-May-2024 | | 75 | | | 10 | (737) |
| 22-May-2024 | | 300 | | | 30 | (1,067) |
| 23-May-2024 | | 215 | | | 25 | (1,307) |
| 24-May-2024 | | 380 | | | 39 | (1,726) |
| 25-May-2024 | | 1,016 | | | 106 | (2,848) |
| 26-May-2024 | | 389 | | | 40 | (3,277) |
| 27-May-2024 | | 60 | | | 9 | (3,346) |
| 28-May-2024 | | 740 | | | 85 | (4,171) |
| 29-May-2024 | | 545 | | | 58 | (4,774) |
| 31-May-2024 | | | | | | (4,774) |
| Total² | | 4,196 | - | - | 448 | |

¹ Numbers may not add due to rounding.

² Total Transactions for May 2024.

Table A-2: Avoided Spill Energy³

| Date | Avoided Spill Exports (MWh) | Energy Losses to Export (MWh) | Transfer of Pond Balance to Spill Avoidance (MWh) | YTD Avoided Spill Energy (MWh) |
|--------------------------|-----------------------------|-------------------------------|---|--------------------------------|
| Opening Balance | | | | 0 |
| 2-May-2024 | 145 | 25 | | 170 |
| Total⁴ | 145 | 25 | - | 170 |

³ Numbers may not add due to rounding.

⁴ Total Transactions for May, 2024.

Appendix B

Production and Purchases



Table B-1: Generation and Purchases (GWh)¹

| | May 2024 | YTD May 2024 |
|---|--------------|----------------|
| Hydro Generation (Hydro) | | |
| Bay d'Espoir | | |
| Unit 1 | 26.3 | 188.4 |
| Unit 2 | 40.5 | 201.8 |
| Unit 3 | 26.3 | 151.2 |
| Unit 4 | 14.3 | 98.3 |
| Unit 5 | 5.3 | 89.0 |
| Unit 6 | 0.0 | 98.9 |
| Unit 7 | 81.7 | 384.1 |
| Subtotal Bay d'Espoir | 194.4 | 1,211.7 |
| Upper Salmon | 52.0 | 259.6 |
| Granite Canal | 21.9 | 116.1 |
| Hinds Lake | 42.7 | 184.9 |
| Cat Arm | | |
| Unit 1 | 38.1 | 217.1 |
| Unit 2 | 42.4 | 221.7 |
| Subtotal Cat Arm | 80.5 | 438.8 |
| Paradise River | 1.8 | 13.8 |
| Star Lake | 10.7 | 57.8 |
| Rattle Brook | 2.6 | 6.8 |
| Nalcor Exploits | 54.8 | 262.6 |
| Mini Hydro | 0.0 | 0.0 |
| Total Hydro Generation (Hydro) | 461.2 | 2,552.0 |
| Thermal Generation (Hydro) | | |
| Holyrood TGS | | |
| Unit 1 | 0.0 | 180.1 |
| Unit 2 | 13.5 | 17.0 |
| Unit 3 | 19.9 | 204.7 |
| Subtotal Holyrood TGS Units | 33.5 | 401.8 |
| Holyrood Gas Turbine and Diesels | 0.2 | 5.1 |
| Hardwoods Gas Turbine | 0.0 | 0.3 |
| Stephenville Gas Turbine | 0.0 | 0.0 |
| Other Thermal | 0.0 | 0.0 |
| Total Thermal Generation (Hydro) | 33.7 | 407.2 |
| Purchases | | |
| Requested Newfoundland Power and Vale CBPP | 0.0 | 0.0 |
| Capacity Assistance | 0.0 | 0.5 |
| Power Purchase Agreement | 12.4 | 74.8 |
| Secondary | 0.0 | 1.7 |
| Co-Generation | 0.0 | 10.6 |
| Subtotal CBPP | 12.4 | 87.7 |
| Wind Purchases | 10.5 | 82.9 |
| Maritime Link Imports ² | 0.0 | 0.0 |
| New World Dairy | 0.0 | 0.1 |
| Labrador Island Link Delivery to IIS ^{3,4} | 7.1 | 331.3 |
| Total Purchases | 30.0 | 502.1 |
| Total⁵ | 524.9 | 3,461.3 |

¹ Gross generation.

² Includes energy flows as a result of purchases and inadvertent energy.

³ LIL deliveries to the Island Interconnected System are calculated by total LIL imports of 144.0 GWh less Maritime Link Exports of 136.9 GWh.

⁴ Net energy delivered to the Island Interconnected System is less than the total energy delivery to Hydro under the Muskrat Falls Power Purchase Agreement because of transmission losses on the LIL.

⁵ Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total versus addition of individual components due to rounding.