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July 17, 2023

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

Attention: Cheryl Blundon
Director Corporate Services and Board Secretary

Re: Monthly Energy Supply Report for the Island Interconnected System for June 2023

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

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Encl.

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Monthly Energy Supply Report for the Island Interconnected System for June 2023

July 17, 2023

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, as contained in Hydro's Quarterly 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 June 2023.¹

2.0 System Hydrology

Reservoir inflows in June 2023 were approximately 26% above 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	2023 (GWh)	2022 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Maximum Operating Level (%)
30-Jun-2023	2,031	2,540	2,156	1480	2,588	78

The aggregate reservoir storage level on June 30, 2023 was 2,031 GWh, which is 22% below the seasonal maximum operating level and 37% above the minimum storage limit.³ Weather conditions were much

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 hours).

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 (“Muskrat Falls 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 wetter across the Island in June 2023, with several moderate precipitation events occurring throughout
2 the month and two significant rainfall events occurring from June 10 to 11, 2023 and June 25, 2023.
3 During the June 10–11, 2023 event, approximately 35–60 mm of rain fell over the Bay d’Espoir System
4 and approximately 60 mm fell at Hinds Lake. During the June 25, 2023 event, an additional approximate
5 45 mm fell at Hinds Lake. All remaining snow within the Hinds Lake watershed melted by mid-June 2023.
6 By the end of June 2023, the only remaining snow in the Cat Arm watershed was in the very highest
7 elevation areas. June 2023 inflows to the Bay d’Espoir System were approximately 22% above average.
8 Inflows due to spring runoff continued to accelerate throughout the month of June 2023 at Hinds Lake
9 and Cat Arm and were accentuated by several rainfall events. Inflows were approximately 63% and 25%
10 above average during the month at these two locations.

11 Bay d’Espoir Unit 6 outage that began on May 24, 2023 ended on June 10, 2023. The Bay d’Espoir Unit 5
12 outage that began on May 24, 2023 continued through the end of June 2023. The annual planned
13 maintenance outage on the unit at the Granite Canal Hydroelectric Generating Station began on
14 June 18, 2023 and ended on June 29, 2023. There was also a brief planned outage on Bay d’Espoir Unit 4
15 on June 22, 2023. The Upper Salmon Hydroelectric Generating Station remained offline through the
16 month of June 2023.

17 Figure 1 plots the 2022 and 2023 storage levels, minimum storage limits, maximum operating level
18 storage, and 20-year average aggregate storage for comparison. In addition to the 2022–2023 limits
19 presented in Figure 1, Hydro has established the minimum storage limits to April 30, 2024. The 2023–
20 2024 limits were developed considering maximized delivery of power from the Muskrat Falls Facility,
21 supplemented by available Recapture Energy from the Churchill Falls Generating Station over the LIL
22 utilizing the transmission limits associated with the 58.0 Hz under-frequency load shedding scheme.⁴

⁴ The 2023–2024 analysis assumed that only two units at the Holyrood TGS would be online and operating at minimum load during the winter 2023–2024 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.

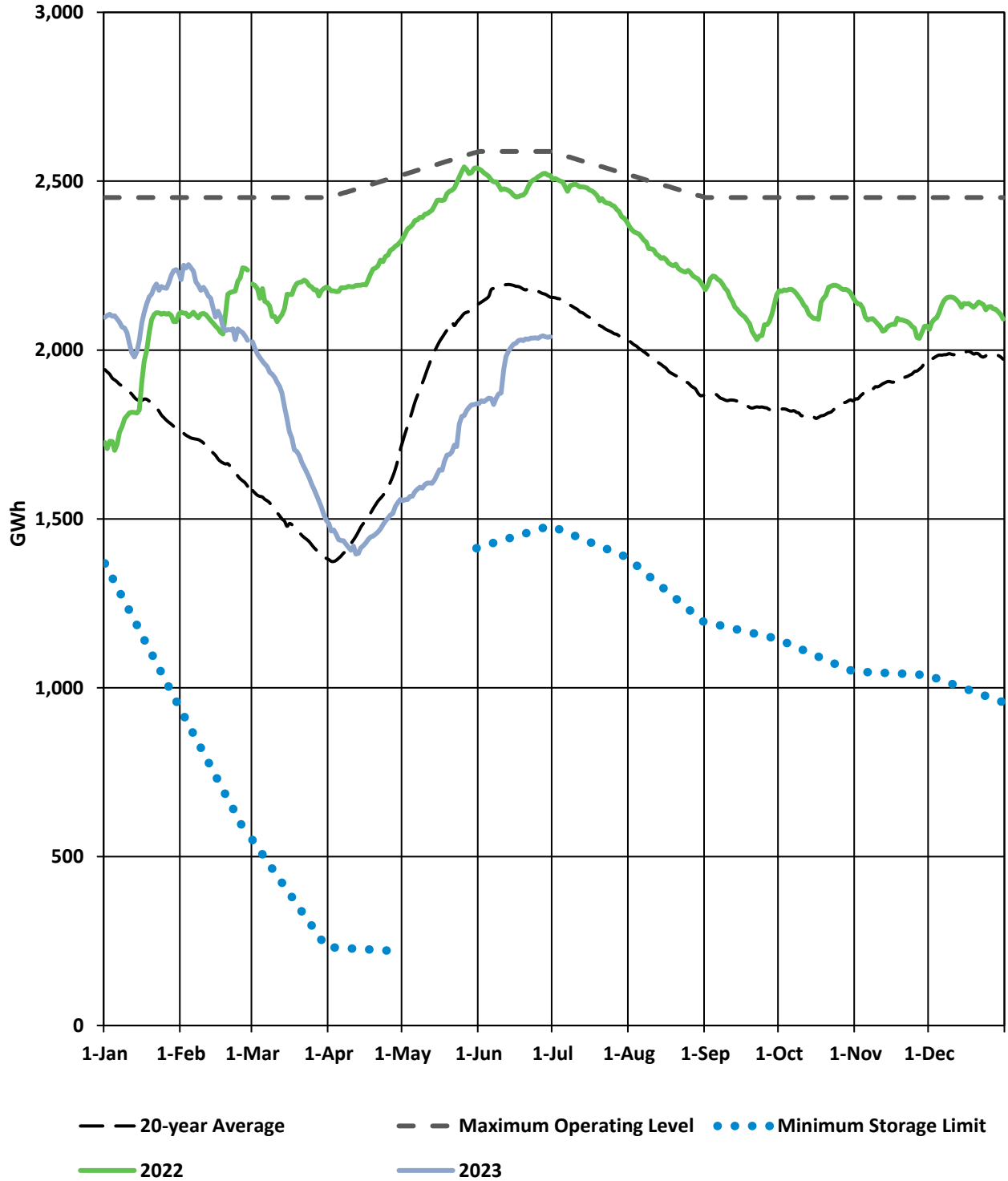


Figure 1: Total System Energy Storage⁵

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.

1 **2.1 Ponding**

2 In Order No. P.U. 49(2018),⁶ the Board approved Hydro’s application for approval of a Pilot Agreement
3 for the Optimization of Hydraulic Resources (“Pilot Agreement”).⁷ 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.

6 Appendix A provides a log of imported and exported energy transactions under the Pilot Agreement
7 during the month. No ponding imports or exports occurred in June 2023.

8 **2.2 Spill Activity**

9 Bypass flows at North Salmon Spillway continued throughout June 2023 to support Long Pond Reservoir
10 storage while the unit at the Upper Salmon Station. Bypass at this location is expected to continue until
11 the unit at the Upper Salmon Station is released for service.

12 Generation at the Cat Arm Hydroelectric Generating Station (“Cat Arm Station”) was maximized on
13 May 30, 2023 due to increasing reservoir levels. Generation at the Hinds Lake Hydroelectric Generating
14 Station (“Hinds Lake Station”) was maximized on June 9, 2023 due to increasing reservoir levels and
15 forecasted significant rainfall increasing the risk of spill. Maximized generation continued throughout
16 the month of June 2023, with generation prioritized at both locations. The Cat Arm Reservoir reached its
17 maximum operating level of 323.20 m on June 27, 2023, however, there was no measurable spill volume
18 recorded in June 2023. No spill occurred at any other locations during June 2023.

19 A summary of the amount spilled or bypassed in both MCM⁸ and GWh for June 2023 as well as year-to-
20 date (“YTD”) totals are provided in Table 2. Appendix A provides a log of spill avoidance export
21 transactions during the month. Energy exports to mitigate spill were not required in June 2023.⁹

⁶ *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 49(2018), Board of Commissioners of Public Utilities, December 18, 2018.

⁷ The Third Amended and Restated Pilot Agreement for the Optimization of Hydraulic Resources was approved as per *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 35(2022), Board of Commissioners of Public Utilities, December 16, 2022.

⁸ Million cubic metres (“MCM”).

⁹ Pursuant to the Pilot Agreement for the Optimization of Hydraulic Resources, exporting when system load is low allows for sustained 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.

Table 2: Spill Activity¹⁰

	Burnt Dam Spillway		Granite Canal Bypass		Upper Salmon Bypass	
	MCM	GWh	MCM	GWh	MCM	GWh
30-Jun-2023	0	0	0	0	350.1	45.7
YTD Total	122.7	80.8	19.8	1.9	2025.1	264.1

1 3.0 Production and Purchases

2 Appendix B provides a breakdown of power purchases, including imports, and production by plant
3 during June 2023.

4 4.0 Thermal Production and Imports

5 Total energy production from the units at the Holyrood TGS was 0 GWh in June 2023. Unit 3 at the
6 Holyrood TGS operated in synch condense mode in June 2023 for system requirements. Standby
7 generation was not required to support reservoir storage. The operating hours for the Holyrood TGS and
8 the Hardwoods, Stephenville, and Holyrood Gas Turbines are summarized in Table 3.

Table 3: Holyrood TGS and Gas Turbines Operating Hours

	Operating Hours	Synch Condense Hours	Available Hours
Holyrood TGS			
Unit 1	0	0	720.0
Unit 2	0	0	0
Unit 3	0	720.0	720.0
Gas Turbines			
Hardwoods	5.1	650.9	656.0
Stephenville	14.7	17.8	728.4
Holyrood	26.4	0	474.3

9 Table 4 summarizes the Muskrat Falls energy deliveries, Corner Brook Pulp and Paper Limited (“CBPP”)
10 energy repair to Energy Marketing, and emergency supply to Nova Scotia in June 2023.

¹⁰ Numbers may not add due to rounding.

Table 4: Muskrat Falls Energy Deliveries and Export Activity (GWh)

	Energy
Muskrat Falls Energy Deliveries	
Muskrat Falls Power Purchase Agreement (Hydro)	37.8
Nova Scotia Block and Supplemental Energy ¹¹	105.5
Energy Marketing Bulk Surplus Exports ¹²	58.0
Other Activity	
CBPP Energy repaid to Energy Marketing	0.0
Emergency Supply to Nova Scotia ¹³	0.2

1 **5.0 Unit Deratings**

2 Unit 1 at the Holyrood TGS was offline in cold standby for the entire month of June 2023, as it was not
 3 required by the system operator to meet energy supply demands. Unit 2 at the Holyrood TGS was offline
 4 for the planned annual maintenance outage for the entire month of June 2023. Unit 3 at the
 5 Holyrood TGS was online in synchronous condenser mode for the entire month of June 2023. Outage
 6 work on the assets not required for synchronous condenser operation was performed in parallel.

7 The Hardwoods Gas Turbine was available at full capacity for the full month of June 2023, with the
 8 exception of a planned maintenance outage starting on June 28, 2023, which continued to the end of
 9 the month to preform preventive and corrective maintenance.

10 The Holyrood Gas Turbine was available at full capacity for the entire month of June 2023, with the
 11 exception of a planned outage from June 7 to 17, 2023 to complete planned and corrective maintenance
 12 activities.

13 The Stephenville Gas Turbine was available at full capacity for the entire month of June 2023, with the
 14 exception of a planned outage on June 5, 2023 to replace a vibration accelerometer cable and from
 15 June 19 to 25, 2023 to complete preventive and corrective maintenance activities.

¹¹ Nova Scotia Block and Supplemental Energy quantities are reflected at the point of commercial transaction.

¹² Energy Marketing has updated its reporting of Bulk Surplus Exports and CBPP energy repaid to Energy Marketing. The Bulk Surplus Exports figure now reports only Muskrat Falls energy exported to external markets. CBPP Energy repaid to Energy Marketing continues to be reported separately.

¹³ Under the Interconnection Operators Agreement between Hydro and Nova Scotia Power.

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 Ponded Energy (MWh)
Opening Balance						-
Total ²	-	-	-	-	-	

Table A-2: Avoided Spill Revenue¹

Date	Avoided Spill Exports (MWh)	Energy Losses to Export (MWh)	Transfer of Pond Balance to Spill Avoidance (MWh)	Cumulative Avoided Spill Energy (MWh)
Opening Balance				73,427
Total ²	-	-	-	

¹ Numbers may not add due to rounding.

² As of June 30, 2023.

Appendix B

Production and Purchases



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

	June 2023	YTD June 2023
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	39.5	247.2
Unit 2	39.5	245.0
Unit 3	23.9	157.1
Unit 4	12.2	146.1
Unit 5	0.0	133.5
Unit 6	4.5	158.8
Unit 7	48.5	483.8
Subtotal Bay d'Espoir	168.1	1,571.5
Upper Salmon	0.0	108.9
Granite Canal	15.6	128.1
Hinds Lake	39.6	201.1
Cat Arm		
Unit 1	37.8	195.3
Unit 2	39.2	204.6
Subtotal Cat Arm	77.0	399.8
Paradise River	2.2	15.9
Star Lake	12.3	72.4
Rattle Brook	2.4	8.2
Nalcor Exploits	56.0	325.4
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	373.2	2,831.2
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	0.0	150.9
Unit 2	0.0	200.8
Unit 3	0.0	126.2
Subtotal Holyrood TGS Units	0.0	477.9
Holyrood Gas Turbine and Diesels	1.1	14.2
Hardwoods Gas Turbine ²	0.1	1.5
Stephenville Gas Turbine ³	0.1	1.5
Other Thermal	0.0	0.3
Total Thermal Generation (Hydro)	1.3	495.5
Purchases		
Requested Newfoundland Power and Vale CBPP	0.0	0.1
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	2.3	13.5
Co-Generation	3.4	22.2
Subtotal CBPP	5.7	35.7
Wind Purchases	11.5	100.0
Maritime Link Imports ²	0.0	0.2
New World Dairy	0.1	1.3
LIL Imports ³	191.0	1,346.3
Maritime Link Exports ^{4,5}	157.0	870.3
Net LIL Delivery to IIS ⁶	34.1	476.0
Total Purchases	208.3	1,483.6
Total⁷	582.8	4,810.2

¹ Gross generation.

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

³ Includes purchases as a result of testing activity as well as deliveries that are then exported over the Maritime Link.

⁴ Totals include the provision of emergency and inadvertent energy to Nova Scotia Power Inc., provision of the Nova Scotia Block, the Supplemental Block, and export activity conducted by Energy Marketing including the export of spilled energy on Hydro's behalf.

⁵ Physical delivery of the Nova Scotia Block will typically only occur when the LIL is online and able to transfer power. CBPP energy repaid to Energy Marketing may be used to supply the Nova Scotia Block while the LIL is offline.

⁶ Net energy delivered to the Island Interconnected System ("IIS") is less than the total energy purchased by Hydro under the Muskrat Falls Power Purchase Agreement because of transmission losses on the LIL.

⁷ Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total versus addition of individual components due to rounding.