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January 18, 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 & Board Secretary

Re: Monthly Energy Supply Report for the Island Interconnected System for December 2022

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/kd

Encl.

ecc:

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Monthly Energy Supply Report for the Island Interconnected System

December 2022

January 18, 2023

A report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro

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List of Appendices

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 de-rating.

In July 2016, the Board indicated that a monthly report would thereafter be sufficient. This report provides data for December 2022.

2.0 System Hydrology

Reservoir inflows in December 2022 were approximately 23% above the month's historical average. Inflows in 2022 ended at 125% of the annual historical average.[1]

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	2022 (GWh)	2021 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Maximum Operating Level (%)
31-Dec-2022	2,095	1,723	1,946	1,382	2,452	85

The aggregate reservoir storage level on December 31, 2022 was 15% below the seasonal maximum operating level and 52% above the minimum storage limit.[2] Overall system inflows in December 2022

[1] Percent of average inflows in this paragraph are calculated in terms of energy (gigawatt hours).

[2] 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, maximum generation at the Holyrood Thermal Generating Station ("Holyrood TGS"), and non-firm imports. Hydro's long-term critical dry sequence is defined as January 1959 to March 1962 (39 months). Other dry periods are also examined during the derivation to ensure that no other shorter-term historic dry sequence could result in insufficient storage.

were above average because of above freezing temperatures and rainfall throughout the Bay d'Espoir system and in the Hinds Lake watershed.

A number of planned outages were completed for winter readiness checks throughout December: (i) Bay d'Espoir Unit 7 from December 1–4, 2022, (ii) Hinds Lake on December 6, 2022, (iii) Bay d'Espoir Unit 4 on December 13, 2022, and (iv) Bay d'Espoir Unit 6 on December 14, 2022.

Figure 1 plots the 2021 and 2022 storage levels, minimum storage limits, maximum operating level storage, and the 20-year average aggregate storage for comparison.

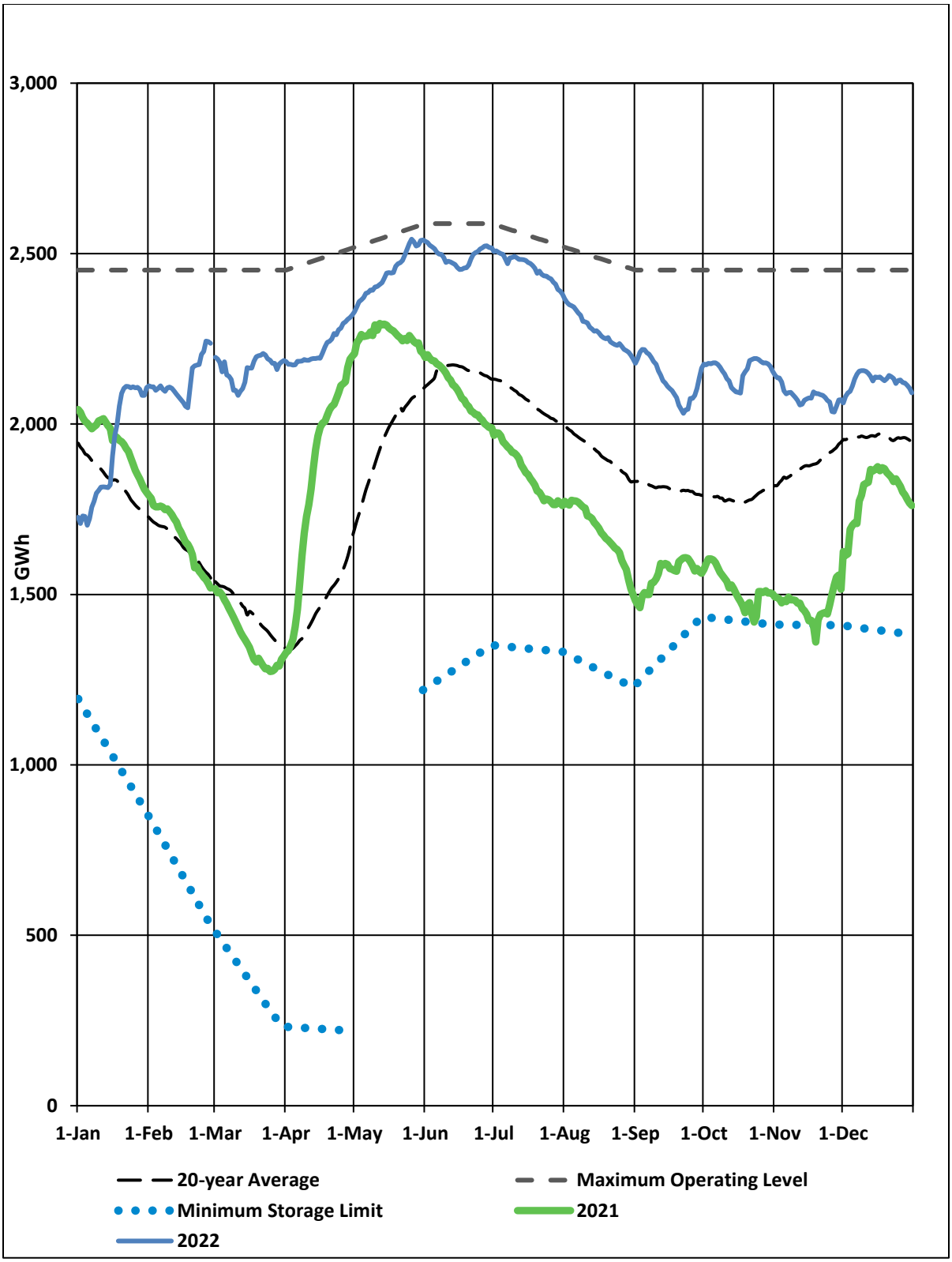

Figure 1: Total System Energy Storage

3.0 Production and Purchases

Appendix A provides a breakdown of power purchases, including imports, and production by plant during December 2022.

4.0 Thermal Production and Imports

All three units at the Holyrood TGS were required to generate in December 2022 for system requirements. Holyrood TGS Unit 1 was operated for 425 hours, Unit 2 was operated for 744 hours, and Unit 3 was operated for 672 hours. Total energy production from the Holyrood TGS during December 2022 was 132.4 GWh.

Standby units were operated for a total of 1.1 hours during the month to support system requirements. Total standby production during the month was 0 GWh. Standby generation was not required to support reservoir storage. The Hardwoods Gas Turbine was operated in synchronous condenser mode for 743 hours.

Table 2 summarizes the Muskrat Falls energy deliveries, ponding activity, Corner Brook Pulp and Paper Limited ("CBPP") energy repaid to Energy Marketing, and emergency supply to Nova Scotia in December 2022.

Table 2: Muskrat Falls Deliveries and Export Activity

	Energy (GWh)
Muskrat Falls Energy Deliveries	
Muskrat Falls Power Purchase Agreement (Hydro)	29.5
Nova Scotia Block and Supplemental Energy[3]	87.3
Energy Marketing Bulk Surplus Exports[4]	0.2
Ponding Activity	
Ponding Exports	0.0
Ponding Balance	-9.8
Other Activity	
CBPP Energy repaid to Energy Marketing[5]	0.7
Emergency supply to Nova Scotia[6]	1.1

[3] Nova Scotia Block and Supplemental Energy quantities are reflected at the point of commercial transaction. Due to power system operations, metered quantities may not match commercially transacted volumes

[4] Bulk surplus energy includes Muskrat Falls energy and energy repaid to Energy Marketing by CBPP that is sold to external markets.

[5] Energy repaid to Energy Marketing by CBPP pursuant to the Temporary Energy Exchange Agreement was exported over the Maritime Link.

[6] Under the Interconnection Operators Agreement between Hydro and Nova Scotia Power.

5.0 Unit Deratings

Unit 1 at the Holyrood TGS was operating with a forced derate to 80 MW due to the failure of the east boiler feed pump motor, which occurred on November 15, 2022. On December 8, 2022, the unit was taken offline for a planned outage for Transmission and Rural Operations to perform remedial work on the T1 output transformer ("T1"). On December 12, 2022, while the unit was offline, the failed boiler feed pump motor was replaced. This removed the forced derating. Unit 1 was returned to service with full load capability after completion of the T1 outage on December 21, 2022. The unit was online with full capability for the remainder of the month.

Unit 2 at the Holyrood TGS was online with full capability for the entire month of December.

Unit 3 at the Holyrood TGS was operating with a forced derating to 140 MW at the beginning of December due to top elevation burner issues. The derating was increased on December 1, 2022, reducing the maximum unit output to 100 MW as work crews continued to work on the issue. On December 2, 2022 the issue was resolved and the unit was available for full load of 150 MW. On December 12, 2022 there was another burner issue that caused a derating to 130 MW. This was resolved on December 13, 2022 and the unit returned to full capability. The unit tripped on December 15, 2022 due to a leak in the fire suppression system inside the turbine front standard. The unit was returned to service with full capability on December 18, 2022 after investigation and resolution of the problem. On December 19, 2022 plant staff successfully completed an upgrade of the Unit 3 burner flame scanners, which should mitigate the burner related de-ratings that were experienced this month. The unit was online with full capability for the remainder of the month.

The Hardwoods, Holyrood and Stephenville Gas Turbines were available at full capacity for the entire month of December.

Appendix A

Production and Purchases

Table A-1: Generation and Purchases[1]

	December 2022 (GWh)	YTD[2] 2022 (GWh)
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	43.0	457.4
Unit 2	42.8	466.7
Unit 3	40.8	364.5
Unit 4	25.7	208.6
Unit 5	20.1	218.2
Unit 6	31.5	232.3
Unit 7	81.1	855.6
Subtotal Bay d'Espoir	285.1	2,803.3
Upper Salmon	59.4	537.8
Granite Canal	27.3	236.2
Hinds Lake	41.7	392.0
Cat Arm		
Unit 1	33.6	309.5
Unit 2	35.0	345.7
Subtotal Cat Arm	68.6	655.1
Paradise River	4.9	34.3
Star Lake	12.6	132.2
Rattle Brook	1.2	15.0
Nalcor Exploits	56.4	584.6
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	**557.2**	**5,390.5**
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	29.9	275.7
Unit 2	54.9	321.1
Unit 3	47.6	203.1
Subtotal Holyrood TGS Units	132.4	800.0
Holyrood Gas Turbine and Diesels	0.0	1.8
Hardwoods Gas Turbine	0.0	0.8
Stephenville Gas Turbine	0.0	0.6
Other Thermal	0.0	0.6
Total Thermal Generation (Hydro)	**132.4**	**803.7**
Purchases		
Requested Newfoundland Power and Vale CBPP	0.0	0.0
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	3.3	41.0
Co-Generation	4.8	46.1
Subtotal CBPP	8.1	87.1
Wind Purchases	18.6	184.2
Maritime Link Imports[3]	0.3	2.0
New World Dairy	0.3	3.3
LIL Imports[4]	113.0	1,305.5
ML Exports[5, 6]	90.6	1,119.0
Net LIL Delivery to IIS[7]	22.4	186.5
Total Purchases	**140.3**	**1,582.1**
Total[8]	**829.9**	**7,776.2**

[1] Gross generation.
[2] Year-to-date ("YTD").
[3] Includes energy flows as a result of purchases and inadvertent energy.
[4] Includes purchases as result of testing activity as well as deliveries that are then exported over the Maritime Link.
[5] 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 Newfoundland and Labrador Hydro's ("Hydro") behalf.
[6] Physical delivery of the Nova Scotia Block will only occur when the Labrador-Island Link ("LIL") is online and able to transfer power.
[7] Net energy delivered to the Island Interconnected System is less than the total energy delivery to Hydro under the Muskrat Falls Power Purchase Agreement ("Muskrat Falls PPA") because of transmission losses on the LIL. Additionally, the ratio of the energy deliveries to Nova Scotia and to Hydro is reflective of an operating restriction in place to ensure reliable service for customers while the LIL is in monopole mode. The loss of the pole while the LIL is operating in monopole mode would result in underfrequency load shedding to Island customers if deliveries to Hydro were to exceed 30 to 40 MW, depending on system conditions. On this basis, operating restrictions are in place to restrict Hydro energy deliveries when the LIL is in service as a monopole to ensure reliable service for customers. As the LIL was primarily in operation in monopole mode in December 2022, Hydro received less power transfers than Nova Scotia. Nova Scotia is capable of accepting significantly higher power transfers during monopole operation of the LIL without subjecting customers to adverse risk. This is because the power system in Nova Scotia is synchronously tied to the North American Grid and the interruption of power flows from Newfoundland and Labrador would not result in customer impact. Hydro's entitlement under the Muskrat Falls PPA remains unchanged, with any shortfall in deliveries in current/near term periods to be addressed in future.
[8] Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total versus addition of individual components due to rounding.