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January 17, 2022

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

Attention: Ms. Cheryl Blundon
Director Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: Monthly Energy Supply Report for the Island Interconnected System for December 2021

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
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Encl.

ecc:

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Monthly Energy Supply Report for the Island Interconnected System for December 2021

January 17, 2022

A report to the Board of Commissioners of Public Utilities



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Appendix A: Production and Purchases

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 December 2021.

2.0 System Hydrology

Reservoir inflows in December 2021 were approximately 44% above the month’s historical average. Inflows in 2021 ended at 96% of the annual historical average.

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	2021 (GWh)	2020 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Percentage of Maximum Operating Level (%)
31-Dec-2021	1,723	2,041	1,940	1,205	2,452	70

The aggregate reservoir storage level on December 31, 2021 was 1,723 GWh, which is 30% below the seasonal maximum operating level and 43% above the minimum storage limit.¹ The current storage level

¹ 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 Holyrood Thermal Generating Station, 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.

1 is shown in Figure 1 in relation to the 20-year average storage level for the end of December of
2 1,940 GWh. At the end of December 2020, the aggregate storage level was 2,041 GWh.

3 The combination of generation above minimum on the available unit at the Holyrood Thermal
4 Generating Station (“Holyrood TGS”) and imports of energy to offset thermal generation in November
5 2021 helped to slow the decline of total system energy. The series of rainfall events that occurred over
6 all reservoir basins towards the end of November, and the return to service of a second Holyrood TGS
7 unit on December 1, 2021, allowed Hydro to return Holyrood TGS production to minimum levels and
8 cease the Maritime Link imports for support of reservoir levels on December 4, 2021.

9 Standby units have not been used for water management purposes and Hydro does not currently
10 foresee using production from standby generation to support reservoir levels.

11 Figure 1 plots the 2020 and 2021 storage levels, minimum storage limits, maximum operating level
12 storage, and the 20-year average aggregate storage for comparison.

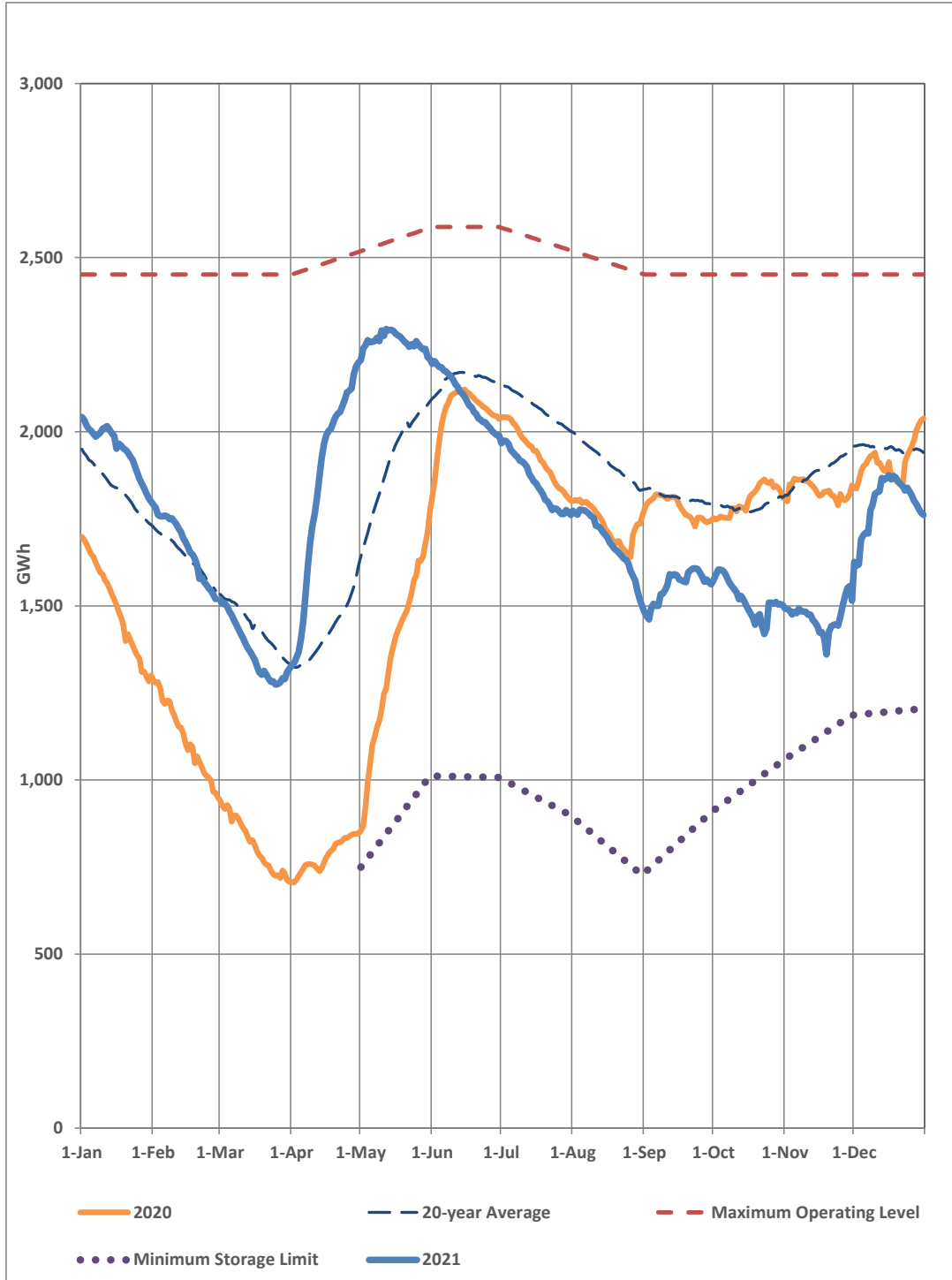


Figure 1: Total System Energy Storage

3.0 Production and Purchases

Appendix A provides a breakdown of power purchases, including imports, and production by plant during December 2021.

4.0 Thermal Production and Imports

Units 1 and 3 at the Holyrood TGS were required to generate during December 2021 for system requirements. Holyrood TGS Unit 1 was operated for 711.2 hours, and Holyrood TGS Unit 3 was operated for 744 hours. Unit 2 was not operated during December 2021. Total energy production from Holyrood TGS during the month of December 2021 was 122.6 GWh.

Standby units were operated during the month to support system requirements and for testing purposes. Standby units were operated for a total of 132 hours during the month. Total standby production during the month was 6.4 GWh. Standby generation was not required to support reservoir storage.

Testing activities continued on the Labrador-Island Link (“LIL”) in December 2021, resulting in the delivery of 80.1 GWh of energy at Soldiers Pond. Total metered energy over the Maritime Link to the Island Interconnected System for the month of December 2021 was 1.1 GWh. Energy Marketing made purchases totalling 0.7 GWh to offset the use of thermal generation above minimum and support reservoir storage.² Total metered energy over the Maritime Link to Nova Scotia for the month of December 2021 was 49.1 GWh.^{3,4} Energy Marketing exported 49.2⁵ GWh associated with the delivery of the Nova Scotia Block and Supplemental Energy. Pondering activities did not occur in December 2021. The ponded balance at month end remained at -5.4 GWh. On December 8, 2021 and December 10, 2021, a total of approximately 1.0 GWh⁶ was generated to supply emergency energy to Nova Scotia Power, pursuant to the Interconnection Operators Agreement⁷ between Hydro and Nova Scotia Power.⁸

² Totals include the receipt of inadvertent energy from Nova Scotia Power Inc.

³ 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.

⁴ Physical delivery of the Nova Scotia Block will only occur when the LIL is online and able to transfer power.

⁵ Due to power system operations, metered quantities may not match commercially transacted volumes.

⁶ Total energy supplied amounted to 962 MWh.

⁷ Article 5, Schedules A3 and C9.

⁸ A copy of the agreement was provided in “The Board’s Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System – Availability of Requested Information from Hydro, July 5, 2017 Update,” Appendix C.

1 **5.0 Unit Deratings**

2 Holyrood TGS Unit 1 was returned to service on December 1, 2021 after completion of the work to
3 investigate and restore the unit following the cold reheat piping event that occurred on October 25,
4 2021. The unit was returned to service with a scheduled derating to 150 MW pending completion of
5 online safety valve testing. On December 2, 2021 the unit tripped due to an operational issue with the
6 fuel oil system. During return to service on December 3, 2021 there was another trip of the unit related
7 to unit startup. The unit was returned to service approximately four hours later, with the same
8 scheduled derating to 150 MW. On December 4, 2021 the online safety valve testing was completed and
9 the unit was released for full load operation. From December 12, 2021 to December 14, 2021 the unit
10 was derated to 160 MW due to high gland steam pressure in the turbine. This issue was resolved on
11 December 14, 2021 and full load capability proven with a load test.

12 Holyrood TGS Unit 2 remained on a forced outage for the entire month of December 2021 as a result of
13 the failure of the unit output transformer that occurred on November 12, 2021. Transmission and Rural
14 Operations is in the process of replacing the transformer with the spare transformer stored on site. Unit
15 2 was returned to service on January 13, 2022.⁹ Once placed back in service the unit will be derated to
16 150 MW due to the specifications of the spare transformer.

17 Holyrood TGS Unit 3 was on line for the entire month of December 2021. From December 11, 2021 to
18 December 14, 2021 the unit was derated to 140 MW due to high condenser back pressure. This issue
19 was resolved on December 14, 2021.

20 The Hardwoods Gas Turbine was available at full capacity for the entire month of December 2021 with
21 the exception of a planned outage on December 2, 2021 to complete black start testing and a forced
22 derating from December 16, 2021 to December 21, 2021, due to issues with End B's air start and fuel
23 delivery systems.¹⁰

⁹ Following replacement of the main power transformer T2.

¹⁰ Due to limitations inherent in the design of combustion turbines, the output of combustion turbines may be reduced in the event that ambient temperatures exceed the threshold required for full rated output. This threshold is dependent on the design of each turbine.

- 1 The Stephenville Gas Turbine was available at full capacity for the entire month of December 2021.¹¹
- 2 The Holyrood Gas Turbine was available at full capacity for the entire month of December 2021.¹²

¹¹ Due to limitations inherent in the design of combustion turbines, the output of combustion turbines may be reduced in the event that ambient temperatures exceed the threshold required for full rated output. This threshold is dependent on the design of each turbine.

¹² Due to limitations inherent in the design of combustion turbines, the output of combustion turbines may be reduced in the event that ambient temperatures exceed the threshold required for full rated output. This threshold is dependent on the design of each turbine.



Appendix A

Production and Purchases

Table A-1: Generation and Purchases¹

	December 1–31, 2021 (GWh)	YTD ² December 31, 2021 (GWh)
Hydro Generation (Hydro)		
Bay d'Espoir Plant		
Unit 1	43.8	446.4
Unit 2	43.6	437.7
Unit 3	42.8	365.6
Unit 4	28.8	183.2
Unit 5	12.5	144.9
Unit 6	32.9	172.4
Unit 7	95.7	876.2
Subtotal Bay d'Espoir Plant	300.0	2,626.4
Upper Salmon Plant	52.2	448.0
Granite Canal Plant	23.6	240.8
Hinds Lake Plant	35.6	345.4
Cat Arm Plant		
Unit 1	38.4	399.5
Unit 2	39.4	422.8
Subtotal Cat Arm Plant	77.8	822.2
Paradise River	4.7	25.4
Star Lake Plant	11.9	131.7
Rattle Brook Plant	1.5	14.4
Nalcor Exploits Plants	51.8	581.3
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	559.1	5,235.8
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	60.6	267.4
Unit 2	0.0	285.8
Unit 3	62.0	202.3
Subtotal Holyrood TGS Units	122.6	755.4
Holyrood Gas Turbine and Diesels	5.5	24.1
Hardwoods Gas Turbine	0.4	3.4
Stephenville Gas Turbine	0.6	1.4
Other Thermal	0.1	0.2
Total Thermal Generation (Hydro)	129.2	784.5
Purchases		
Requested Newfoundland Power and Vale	0.1	0.2
CBPP ³		
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	0.8	25.1
Co-Generation	4.5	50.1
Subtotal CBPP	5.3	75.2
Wind Purchases	20.0	185.7
Maritime Link Imports ⁴	1.1	12.0
New World Dairy	0.3	3.4
LIL Imports ⁵	80.1	581.8
Total Purchases	106.8	858.3
Total⁶	795.1	6,878.6

¹ Gross generation.

² Year-to-date ("YTD").

³ Corner Brook Pulp and Paper Limited ("CBPP").

⁴ Includes energy flows as a result of purchases and inadvertent energy.

⁵ Includes purchases as result of testing activity as well as deliveries that are then exported over the Maritime Link.

⁶ Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total vs. addition of individual components due to rounding.