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May 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 April 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
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Encl.

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Monthly Energy Supply Report for the Island Interconnected System for April 2022

May 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 April 2022.

2.0 System Hydrology

Reservoir inflows in April 2022 were approximately 7% above the month’s historical average. Inflows in 2022 are 199% of the year-to-date 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	2022 (GWh)	2021 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Percentage of Maximum Operating Level (%)
30-Apr-2022	2,328	2,206	1,667	220	2,518	92

The aggregate reservoir storage level on April 30, 2022 was 2,328 GWh, which is 8% below the seasonal maximum operating level and 958% above the minimum storage limit.¹ The current storage level is

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 (“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.

1 shown in Figure 1 in relation to the 20-year average storage level for the end of April 2022 of
2 1,667 GWh. At the end of April 2021, the aggregate storage level was 2,206 GWh.

3 The third snow survey of 2022 was completed in mid-April 2022. Snow pack data was not collected in
4 the Lower Salmon, Upper Salmon, Grey River, Granite Lake, and Victoria Lake regions since the snow
5 pack was observed to be substantially depleted in those areas. Based on the available data, the survey
6 indicated that, for the system as a whole, snow water equivalent was approximately 42% of average and
7 equivalent energy was approximately 53% of average.² The snowpack represented approximately
8 75 mm of snow water equivalent for the Hinds Lake watershed and approximately 374 mm for the Cat
9 Arm watershed. Spring freshet continues at Cat Arm and is expected to continue through May.

10 Mild temperatures and snowmelt in the Bay d’Espoir system and Hinds Lake watershed resulted in total
11 energy in storage increasing by approximately 150 GWh by month end. Above average inflows resulting
12 from snowmelt continued through the month which sustained high reservoir levels throughout the Bay
13 d’Espoir system. Generation has remained high in the Bay d’Espoir system to the extent possible to
14 manage the risk of spill and mitigate spill quantities, though this has meant decreasing generation at
15 other generating stations in advance of spring freshet. Beginning March 24, 2022, Hydro engaged Energy
16 Marketing to export energy on its behalf to aid in the mitigation of spill pursuant to the Pilot Agreement
17 for the Optimization of Hydraulic Resources which continued through April.³ Energy Marketing was able
18 to export 2.6 GWh of energy on Hydro’s behalf in April.

19 Figure 1 plots the 2021 and 2022 storage levels, minimum storage limits, maximum operating level
20 storage, and the 20-year average aggregate storage for comparison. The minimum storage limits are
21 established to the end of April 2022. The remaining 2022 limits will be established following the freshet.

² Although the snow water equivalent values, and therefore equivalent energy, were below average relative to historical snow pack, it was primarily due to periods of snowmelt during the winter, compounded by an early start to spring freshet. The below average snow pack does not pose a concern as total system energy in storage is high.

³ Exporting when system load is low allowed for sustained generation from island hydraulic facilities and the utilization of water (energy) that would otherwise have been spilled, while not increasing the risk of spill elsewhere in the system.

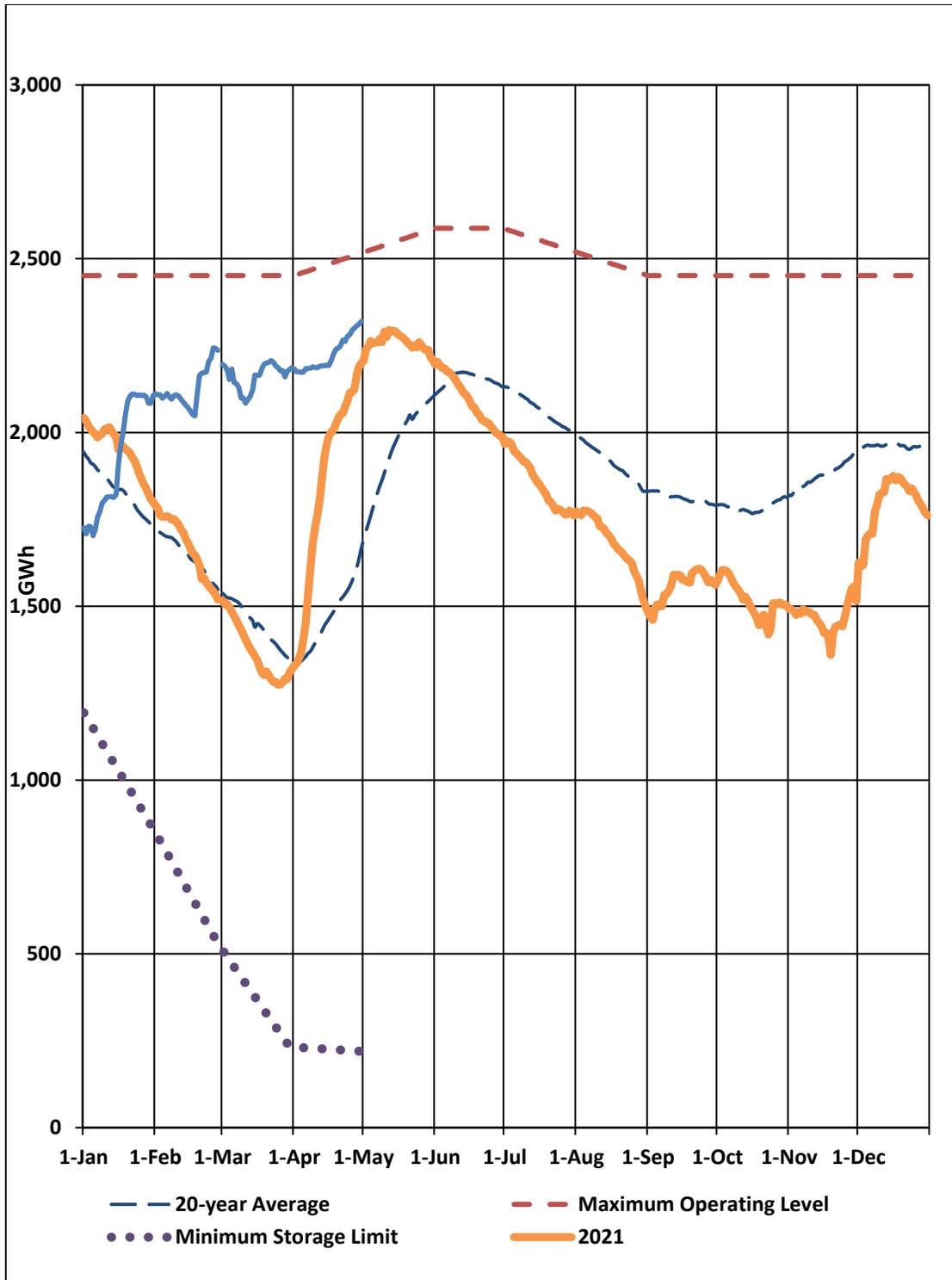


Figure 1: Total System Energy Storage

3.0 Production and Purchases

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

4.0 Thermal Production and Imports

Units 1 and 2 at the Holyrood TGS were required to generate during April 2022 for system requirements. Unit 1 was operated for 504 hours and Unit 2 was operated for 505 hours. Unit 3 was converted to synchronous condenser operational mode and operated for 373 hours. Total energy production from the Holyrood TGS during the month of April 2022 was 57.1 GWh.

Standby units were operated for a total of 30.8 hours during the month to support system requirements and for testing purposes. Total standby production during the month was 0.5 GWh. Standby generation was not required to support reservoir storage.

Testing activities continued on the Labrador-Island Link (“LIL”) in April 2022, resulting in the delivery of 115.5 GWh of energy at Soldiers Pond. Total metered energy over the Maritime Link to Nova Scotia for the month of April 2022 was 107.9 GWh.^{4,5} Energy Marketing exported 104.7 GWh⁶ associated with the delivery of the Nova Scotia Block and Supplemental Energy.⁷ There were no exports over the Maritime Link associated with ponding activities, resulting in a month-end ponded balance of 0.0 GWh. In addition, 2.3 GWh was repaid to Energy Marketing by Corner Brook Pulp and Paper Limited as per the Temporary Energy Exchange Agreement. This energy was also exported over the Maritime Link.

5.0 Unit Deratings

Holyrood TGS Unit 1 was online with full capability at the beginning of April 2022. On April 12, 2022 the unit was derated to 140 MW due to air heater fouling. On April 20, 2022 the unit was removed from service because it was not required by Newfoundland and Labrador System Operator (“NLSO”) to support system loading. From April 21, 2022 to April 22, 2022 an air heater wash was completed to restore full capability of the unit. The unit remained offline until April 23, 2022 because it was not

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 only occur when the LIL is online and able to transfer power.

⁶ Due to power system operations, metered quantities may not match commercially transacted volumes.

⁷ Nova Scotia Block and Supplemental Energy quantities are reflected at the point of commercial transaction.

1 required by the NLSO to support system loading. On April 23, 2022 while returning the unit to service, a
2 hydraulic leak developed and was corrected on the turbine valve control system. During start-up of the
3 unit it tripped twice, on April 23, 2022 and April 25, 2022, due to a generator alarm. Investigation found
4 a loose junction box on the turbine control system, which was corrected on April 25, 2022 and the unit
5 returned to service with full capability. On April 26, 2022, the unit was taken offline because it was not
6 required by the NLSO to support system loading.

7 Holyrood TGS Unit 2⁸ was online with full capability until April 10, 2022 when it was taken offline for a
8 planned outage to replace generator brushes. After completion of this work, the unit remained offline
9 until April 19, 2022 because it was not required by the NLSO to support system loading. Unit 2 returned
10 to service with full capability on April 19, 2022.

11 Holyrood TGS Unit 3 was offline with full capability at the beginning of April 2022 because it was not
12 required by the NLSO to support system loading. From April 4, 2022 to April 15, 2022 the Unit 3
13 generator was converted to synchronous condenser operational mode and it was placed in service as a
14 synchronous condenser on April 15, 2022. Annual outage work on Unit 3 assets are not required for
15 synchronous condenser operation, including the boiler progress in parallel.

16 The Stephenville, Holyrood and Hardwoods Gas Turbines were available at full capacity for the entire
17 month of April 2022 with the exception of a planned outage at the Hardwoods Gas Turbine from
18 April 3, 2022 to April 9, 2022 to complete preventative and corrective maintenance activities.⁹

⁸ 150 MW, as noted in the “Monthly Energy Supply Report for the Island Interconnected System for January 2022,” Newfoundland and Labrador Hydro, February 17, 2022, s. 5.0, p. 4.

⁹ 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

	April 1–30, 2022 (GWh)	YTD ² April 30, 2022 (GWh)
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	14.5	141.6
Unit 2	31.9	158.5
Unit 3	41.8	154.5
Unit 4	33.4	117.9
Unit 5	35.1	121.6
Unit 6	38.0	146.7
Unit 7	96.6	372.2
Subtotal Bay d'Espoir	291.3	1,213.0
Upper Salmon	52.8	210.0
Granite Canal	18.3	88.5
Hinds Lake	37.4	166.2
Cat Arm		
Unit 1	16.1	100.4
Unit 2	21.5	111.7
Subtotal Cat Arm	37.5	212.1
Paradise River	2.9	17.1
Star Lake	11.9	44.6
Rattle Brook	1.6	4.4
Nalcor Exploits	57.9	218.2
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	511.8	2,174.3
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	28.0	190.1
Unit 2	29.1	173.2
Unit 3	0.0	139.2
Subtotal Holyrood TGS Units	57.1	502.5
Holyrood Gas Turbine and Diesels	0.1	0.7
Hardwoods Gas Turbine	0.2	0.4
Stephenville Gas Turbine	0.2	0.3
Other Thermal	0.1	0.4
Total Thermal Generation (Hydro)	57.7	504.2
Purchases		
Requested Newfoundland Power and Vale CBPP ³	0.0	0.0
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	7.6	15.9
Co-Generation	4.9	18.7
Subtotal CBPP	12.4	34.6
Wind Purchases	16.7	71.7
Maritime Link Imports ⁴	0.0	0.3
New World Dairy	0.3	1.1
LIL Imports ⁵	115.5	440.6
Total Purchases	144.9	548.1
Total⁶	714.3	3,226.6

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.