

1 **Q. Reference: November 30, 2022, Hydro Presentation**

2 **Interruptible/Capacity Assistance**

3 With respect to Slide 12:

- 4 **a)** What are the rates charged for interruptible and surplus/excess power by Manitoba
5 Hydro, BC Hydro, Hydro-Quebec and New Brunswick Power. Provide details as to how
6 they are calculated including whether and to what extent they are based on export
7 sales?
- 8 **b)** Do any of Manitoba Hydro, BC Hydro, Hydro-Quebec and New Brunswick Power charge
9 a lower rate for surplus power sold either insider or outside the province in which the
10 utility is located?
- 11 **c)** Which of the other Canadian utilities pay customers a credit to reduce their available
12 firm load as referenced in Section 5.1 of Schedule 1 Attachment 1.
- 13 **d)** Does Manitoba Power sell surplus power at a lesser price than that charged for firm
14 power? If so, what is the price difference and how is it calculated?
- 15 **e)** Does Manitoba Power sell power from water it would otherwise spill for a lower price in
16 export markets? What is the price differential?
- 17 **f)** How does New Brunswick calculate its incremental cost for interruptible energy before
18 adding the 0.9 cents per kWh on peak and 0.3 cents per kWh off peak referenced in
19 Section 5.1 of Schedule 1 Attachment 1? How does the price of surplus or curtailable
20 power in New Brunswick compare with the price at which export power is sold?
- 21 **g)** Where does New Brunswick export power?
- 22 **h)** In British Columbia, is the price of “Freshnet Energy” referred to in Section 5.1 of
23 Schedule 1 Attachment 1 greater or less than the cost of firm energy? Is it set at the
24 value of export power or the Mid-Columbia wholesale price?
- 25 **i)** How much energy does Hydro-Quebec provide to cryptocurrency customers? How
26 much of that energy is firm, non-firm and/or interruptible? What rates does Hydro-
27 Quebec charge to cryptocurrency customers for each of the categories of power it

- 1 supplies? Is it the same for fixed and interruptible and/or curtailable power? Are power
2 rate increases limited on a monthly or annual basis?
- 3 **j)** Has Hydro-Quebec advised that power that is currently deemed surplus is anticipated to
4 be used in the development of new markets within Quebec? Is the price of that power
5 tied to export sales value or will it be supplied in accordance with the general rates?
- 6 **k)** Is Hydro-Quebec limited in the amount of power it can curtail to cryptocurrency
7 customers? If so, explain the limitations. What period of notice is Hydro-Quebec
8 required to give before curtailing power?
- 9 **l)** Does Nova Scotia Power offer a demand charge discount on demand in excess of
10 contract demand?
- 11 **m)** Does any Canadian utility sell domestic power at a rate based on the price at which
12 export power could be sold? If so, name the utility and the basis on which such rates
13 are established differentiating the rates for the categories of domestic power (i.e. firm,
14 interruptible, non-firm and/or surplus excess energy)
- 15 **n)** Has any Public Utility regulator in Canada approved a rate for domestic power at the
16 price that could be obtained for export power?
- 17 **o)** Do USA utilities charge non-firm rates? How are they calculated?
- 18 **p)** Why does a network grid result in less requirement for non-firm arrangements than a
19 radial grid?
- 20 **q)** Which of the radial grids charge a non-firm rate based on the export value of energy in
21 another market?
- 22 **r)** Does NL Hydro store any of its surplus power in any of its reservoirs? Does it manage its
23 water resources so that water that would otherwise have to be spilled is utilized and
24 other water resources conserved?
- 25 **s)** Does NL Hydro deem or designate any of its current power supply as “heritage” pool
26 electricity?
- 27

1 A. a) The rates charged for non-firm service by Manitoba Hydro,¹ BC Hydro,² Hydro-Québec and
2 NB Power³ are summarized below. It is important to note that the structure of the rates for
3 each electrical utility is varied, and therefore these rates are not easily comparable. It is
4 necessary to carefully review the rate structure of each individual utility in order to fully
5 understand the context in which the rates are being charged.

6 **i. Manitoba Hydro Curtailment and Surplus Rates⁴**

7 Manitoba Hydro offers a discount to industrial and commercial customers based on the
8 amount of load they are able to curtail. The size of the discount varies depending on the
9 curtailment option chosen by the customer. Each option comes with a set of conditions that
10 the customer must meet to avail of the discount. These options have been summarized in
11 Table 1a and are called Operation “A”, “E”, and “R”. Options ‘A’ or ‘R’ cannot be combined
12 with each other but may be combined with Option ‘E’ to increase the discount. These
13 options were not displayed on Manitoba Hydro’s website at the time of writing this
14 response, but are outlined in their 2023/24 & 2024/25 General Rate Application (“GRA”).

¹ The Manitoba Hydro-Electric Board (“Manitoba Hydro”).

² The British Columbia Hydro and Power Authority (“BC Hydro”).

³ New Brunswick Power Corporation (“NB Power”).

⁴ “2023/24 & 2024/25 General Rate Application,” The Manitoba Hydro-Electric Board, December 21, 2022, app. 8.13.

<https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/gra_2023_2025/08-13_curtable_rate.pdf>

Table 1a: Manitoba Hydro Curtailment Options

Utility Option	Interruptible Rate	Conditions
Manitoba Hydro – Option A	70% of Reference Discount.	Notice to Curtail: 5 Minutes / Maximum Duration Per Curtailment; 4-1/4 hours / Maximum Daily Hours per Curtailment: 6 hours (October to April) and 10 Hours (May to September) / Maximum Curtailments Per Year: 16 / Maximum Annual Hours of Curtailment: 68 hours / Maximum curtailable load required: 180 MW.
Manitoba Hydro – Option E	35% of Reference Discount	Notice to Curtail: 48 Hours / Maximum Duration Per Curtailment: 10 Days / Maximum Daily Hours per Curtailment: 24 hours / Maximum Curtailments Per Year: 3 / Maximum Annual Hours of Curtailment: 720 hours / Maximum curtailable load required: No limit.
Manitoba Hydro – Option R	70% of Reference Discount + Reserve Discount	Notice to Curtail: 5 Minutes / Maximum Duration Per Curtailment; 4-1/4 hours / Maximum Daily Hours per Curtailment: 10 Hours (April to March) / Maximum Curtailments Per Year: 25 / Maximum Annual Hours of Curtailment: 106.25 hours / Maximum curtailable load required: 50 MW.
Option A + Option E	100% Discount as a Percentage of Reference Discount	Notice to Curtail: combination / Maximum Duration Per Curtailment; combination / Maximum Daily Hours per Curtailment: combination / Maximum Curtailments Per Year: 19 / Maximum Annual Hours of Curtailment: 788 hours.
Option R + Option E	100% Discount as a Percentage of Reference Discount + Reserve Discount	Notice to Curtail: combination / Maximum Duration Per Curtailment; combination / Maximum Daily Hours per Curtailment; combination / Maximum Curtailments Per Year; 28 / Maximum Annual Hours of Curtailment; 826.25 hours.

1 The “Reference Discount” referenced in Table 1a is related to *the marginal value of*
 2 *capacity*. As per Manitoba Hydro’s 2023/24 & 2024/25 GRA, the reserve discount was set
 3 \$4.02 per kw/month as of April 1, 2022. This amount is adjusted each year by an “Inflation
 4 Factor.” The Inflation Factor is calculated at the end of each fiscal year, and is calculated as
 5 the percentage change in the Consumer Price Index for Manitoba as recorded for the most
 6 recent set of 12-month periods for which data are available.

7 The “Reserve Discount” referenced in Table 1a is the fixed price to be paid for energy during
 8 curtailment under Option ‘R’ has been set at \$0.04 per kW as of April 1, 2022. This amount is
 9 based on the value of carrying contingency reserves on Manitoba Hydro units.

1 **Manitoba Hydro Surplus Energy Program⁵**

2 In addition to the Curtailable Rate Program, Manitoba Hydro also provides a Surplus Energy

3 Program (“SEP”) to eligible commercial or industrial customers. In this program, commercial

4 or industrial customers are billed monthly for a basic charge, distribution charge, and energy

5 charge. The energy charge varies from week-to-week according to spot market conditions. A

6 working alternate back-up system is required as lengthy interruptions may occur. Each

7 option under the program is outlined in their 2023/24 & 2024/25 GRA. There are three

8 options for the SEP: (i) for Industrial Loads, (ii) for Heating Loads, and (iii) for Self-Generation

9 Displacement. These are summarized in Table 1b. (Please note that some data has been

10 omitted to present the information in summary form.)

Table 1b: Surplus Energy Program Summary

Option	Rate	Conditions
SEP – Industrial Loads – Option 1 <i>This option is closed to new enrolments.</i>	Energy Charge: The energy charge is determined on a weekly basis for three time-of-use periods (Peak, Shoulder, Off peak) based on the cost of providing energy, which may include the cost of purchasing power, generating energy, and transmission losses. The charge may also consider factors such as seasonality, demand and supply in the MISO ⁶ market, and market volatility or unforeseen supply costs, and adjust adders as needed to balance actual energy costs and revenues from SEP energy. Distribution Charge: The distribution charge is a charge per kWh intended to collect approximately one-third of the embedded cost of distribution, sub transmission, and regional transmission. Basic Customer Charge: There is a basic charge of \$100.00 per month to cover administration and metering costs for SEP customers. Demand Charge: The demand charge is based on the greatest of the measured demand up to the monthly reference level of demand, or 25% of the highest annual reference level of demand. Manitoba Hydro does not guarantee the supply of firm capacity in excess of the reference level of demand.	To be eligible for SEP Option 1, a customer must have a total demand of at least 1000 kVA and a demand associated with SEP that does not exceed 50 MVA, unless the load factor of the load is guaranteed to exceed 25% on a weekly basis. The customer cannot be served under the Curtailable Rate Program and the customer may be required to maintain a minimum Power Factor of 90%. Customers must also designate a reference level of demand for each calendar month, which must be at least 75% of the total demand, unless the customer can demonstrate that they have on-site backup capability to support the process to which SEP is applied.

⁵ “2023/24 & 2024/25 General Rate Application,” The Manitoba Hydro-Electric Board, December 21, 2022, app. 8.16. <https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/gra_2023_2025/08-16_surplus_energy.pdf>

⁶ Midcontinent Independent Transmission System Operator (“MISO”).

Option	Rate	Conditions
SEP – Heating Loads – Option 2	<p>Energy Charge:</p> <p>The energy charge is determined on a weekly basis for three time-of-use periods (Peak, Shoulder, Off-Peak) based on the cost of providing energy, which may include the cost of purchasing power, generating energy, and transmission losses. The charge may also consider factors such as seasonality, demand and supply in the MISO market, and market volatility or unforeseen supply costs, and adjust adders as needed to balance actual energy costs and revenues from SEP energy.</p> <p>Distribution Charge:</p> <p>The distribution charge is a charge per kWh intended to collect approximately one-third of the embedded cost of distribution, sub transmission, and regional transmission.</p> <p>Basic Customer Charge:</p> <p>For loads greater than 1000 kVA: \$100.00 per month.</p> <p>For loads equal to or less than 1000 kVA: \$50.00 per month.</p>	<p>To be eligible for SEP Option 2, the customer must have heating loads with a demand of 200 kW or greater, and is used for space and/or water heating only. The load must be metered separately from the customer's firm load, have an alternate energy source as a back-up facility for the entire SEP load, and not be served under the Curtailable Rate Program. Also, Demand associated with SEP does not exceed 50 MVA except where the load factor of such load is guaranteed by the customer, in writing, to exceed 25% on a weekly basis.</p>
SEP – Self Generation Displacement – Option 3 <i>This option is closed to new enrolments.</i>	<p>Energy Charge:</p> <p>The energy charge is determined on a weekly basis for three time-of-use periods (Peak, Shoulder, Off Peak) based on the cost of providing energy, which may include the cost of purchasing power, generating energy, and transmission losses. The charge may also consider factors such as seasonality, demand and supply in the MISO market, and market volatility or unforeseen supply costs, and adjust adders as needed to balance actual energy costs and revenues from SEP energy.</p> <p>Distribution Charge:</p> <p>The distribution charge is a charge per kWh intended to collect approximately one-third of the embedded cost of distribution, sub transmission, and regional transmission.</p> <p>Basic Customer Charge:</p> <p>For loads greater than 1000 kVA: \$100.00 per month.</p> <p>For loads equal to or less than 1000 kVA: \$50.00 per month.</p>	<p>SEP Option 3 is available to electric loads with a demand between 200 kW and 50,000 kW that are fully backed up by generating equipment owned or leased by the customer and located on the premises of the SEP load. The load must be intermittent and for industrial use, and must be metered separately from the customer's firm load. It must not be served under the Curtailable Rate Program, and Manitoba Hydro may require the customer to maintain a minimum power factor of 90% as a condition of participation.</p>

1 **ii. BC Hydro⁷**

2 BC Hydro offers non-firm rates at Distribution and at Transmission to independent power

3 producers (“IPP”) who require energy for maintenance and black-start requirements. Non-

4 firm rates are also available to Port Customers for use by Eligible Vessels while docked at the

5 Customer’s Port Facility and available to specific customers in certain circumstances when

6 the customer's own electrical generation plant is unable to produce power. BC Hydro also

7 has a Freshet Rate to sell non-firm energy based on incremental cost, when available, and

8 has introduced an Incremental Energy Rate on a pilot basis. The Incremental Energy Rate is

9 similar in structure to the Freshet Rate but is applicable to the full year whenever BC Hydro

10 makes non-firm energy available. The BC Hydro rates and their related conditions have been

11 summarized in Table 2.

Table 2: BC Hydro Non-Firm Rates

Utility Option	Rate⁸	Conditions
Rate Schedule 1253 – Distribution Service – IPP Station Service and Rate Schedule 1853 – Transmission Service – IPP Station Service	Energy Charge: Based on the Intercontinental Exchange Inc. (“ICE”) in the ICE Day Ahead Power Price Report + Monthly Minimum Charge of \$49.	Electricity taken under this Rate Schedule is to be used solely for maintenance and black-start requirements and will not displace electricity normally generated by the Customer.
Rate Schedule 1280 – Shore Power Service (Distribution)	Energy Charge: 10.507 ¢ per kWh+ Administrative Charge: \$150 per month of Use.	For the supply of Shore Power to Port Customers who qualify for General Service for use by Eligible Vessels while docked at the Port, BC Hydro will only provide electricity to the extent that it has energy and capacity to do so. If BC Hydro is required to dispatch a technician to connect docked vessels, the customer will pay time and labor cost.
Rate Schedule 1880 – Transmission Service – Standby and Maintenance Supply	Energy Charge: During the Period of Use, 10.158 ¢ per kWh of <i>metered “Rate Schedule 1880 energy consumption”</i> + Administrative Charge: \$150 per Period of Use.	Energy taken under this rate schedule should only apply to customers who would otherwise generate during periods when all or part of the Customer’s electrical generating plant is curtailed.

⁷ Canada, (2017–2022), *Electric Tariff*, British Columbia Hydro and Power Authority.
 <<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/tariff-filings/electric-tariff/bchydro-electric-tariff.pdf>>

⁸ A “Deferral Account Rate Rider” is also applied to all charges payable as per Canada, (2017–2022), *Electric Tariff*, British Columbia Hydro and Power Authority, pp. 2-11, 2-17, 5-22, and 5-26.

Utility Option	Rate ⁸	Conditions
	Rate Schedule 1880 energy consumption is calculated on an hourly basis during time when demand is at its highest.	
Rate Schedule 1892 – Transmission Service – Freshet Energy	<p>Energy Charge: The greater of</p> <p>a) The Intercontinental Exchange (“ICE”) Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour, and</p> <p>b) \$0/kWh, + \$3/MWh adder</p>	<p>Under the BC Hydro Rate Schedule 1823, eligible customers may receive electricity during the freshet period, which is the period of high water in the spring when hydroelectric generation is at its highest. The rate for the electricity is based on the customer's highest and lowest historical usage during the freshet period, as well as the customer's reference demand. Customers may also request adjustments to their baselines and reference demand if they feel that their historical usage is not representative of their expected usage under the rate schedule. Customers may cancel their supply under this rate schedule at any time prior to July 31. If the customer has an electricity purchase agreement with BC Hydro and has changed their generator turndown for which they are entitled to financial payment, they are not eligible for electricity under this rate schedule.</p>
Rate Schedule 1893 – Transmission Service – Incremental Energy	<p>Energy Charge:</p> <p>The greater of:</p> <p>ICE Mid-Columbia (“Mid-C”) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour on each day of the Billing Period; and</p> <p>\$0/kWh; plus</p> <p>An adder of \$3.00/MWh for the May, June and July Billing Periods and \$7.00/MWh for all other Billing Periods.</p>	<p>This energy is provided to customers already on other established transmission rate programs and the rate structure is similar to Rate Schedule 1892 Freshet Energy Rate referenced above. The difference between 1893 and 1892 is that the incremental rate program is a pilot program that is applicable to customers for the full year, whenever non-firm energy is available. Because this program is offered to existing transmission customers, the customer would otherwise use available firm energy if the program was not offered.</p>

1 **iii. Hydro-Québec⁹**

2 If a customer can exercise some load-shaving capability at Hydro-Québec’s request, Hydro-

3 Québec offers a number of options to reduce the power bills of both medium sized and

4 large sized power customers. These options are summarized in Table 3.

Table 3: Hydro-Québec Non-Firm Options¹⁰

Utility Option	Rate	Conditions
Medium Customer – Option 1: Interruptible	<p>Fixed Credit:</p> <p>\$13.511 per kilowatt for the difference between the average hourly power during useable hours and the base power.</p> <p>Variable Credit:</p> <p>20.787¢ per kilowatt hour of effective hourly interruptible power for each of the first 20 interruption hours;</p> <p>25.983¢ per kilowatt hour of effective hourly interruptible power for each hour between the 21st and the 40th interruption hours inclusive; and</p> <p>31.180¢ per kilowatt hour of effective hourly interruptible power for each of the 60 subsequent interruption hours.</p>	<p>Customers must commit to a base power not exceeding 80% of their average billing demand from the previous winter period.</p> <p>Advance notice: 2 hours on weekdays, 15:30 the preceding day on weekends / Maximum number of interruptions per day: 2 / Minimum interval between interruptions: 4 hours / Maximum number of interruptions per winter period: 20 / Duration of interruption: 4-5 hours / Maximum duration of interruptions per winter period: 100 hours / Interruptions can occur at any time in the winter period.</p>
Medium Customer – Option 2: Interruptible	<p>Fixed Credit:</p> <p>\$9.458 per kilowatt for the difference between the average hourly power during useable hours and the base power.</p> <p>Variable Credit:</p> <p>20.787¢ per kilowatt hour of effective hourly interruptible power for each interruption hour.</p>	<p>Customers must commit to a base power not exceeding 80% of their average billing demand from the previous winter period.</p> <p>Advance notice: 15:00 the preceding day on weekdays, not available on weekends / Maximum number of interruptions per day: 2 / Minimum interval between interruptions: 6 hours / Maximum number of interruptions per winter period: 25 / Duration of interruption: 4 hours / Maximum duration of interruptions per winter period: 100 hours / Interruptions can occur between 06:00 and 10:00 or between 16:00 and 20:00 weekdays in the winter period, excluding statutory holidays.</p>
Large Customer – Option 1: Interruptible	<p>Fixed Credit:</p> <p>\$13.511 per kilowatt of effective interruptible power.</p>	<p>Customers interruptible power must be at least 3,000 kw or 20% the maximum contract power over the last 12 consumption periods ending at the end of the consumption period that precedes October 1.</p>

⁹ “Interruptible Electricity Options for Rate L customers,” Hydro-Québec, <<https://www.hydroquebec.com/business/customer-space/rates/interruptible-electricity-options-large-power-customers.html>>.

¹⁰ Excludes explicit rates that is available to cryptocurrency customers.

Utility Option	Rate	Conditions
	<p>Variable Credit:</p> <p>20.787¢ per kilowatt hour of effective hourly interruptible power for each of the first 20 interruption hours;</p> <p>25.983¢ per kilowatt hour of effective hourly interruptible power for each hour between the 21st and the 40th interruption hours inclusive; and</p> <p>31.180¢ per kilowatt hour of effective hourly interruptible power for each of the 60 subsequent interruption hours.</p>	<p>Advance notice: 2 hours on weekdays, 15:30 the preceding day on weekends / Maximum number of interruptions per day: 2 / Minimum interval between interruptions: 4 hours / Maximum number of interruptions per winter period: 20 / Duration of interruption: 4-5 hours / Maximum duration of interruptions per winter period: 100 hours.</p>
Large Customer – Option 2: Interruptible	<p>Fixed Credit:</p> <p>\$6.756 per kilowatt of effective interruptible power.</p> <p>Variable Credit:</p> <p>20.787¢ per kilowatt hour of effective hourly interruptible power for each interruption hour.</p>	<p>Customers interruptible power must be at least 3,000 kw or 20% the maximum contract power over the last 12 consumption periods ending at the end of the consumption period that precedes October.</p> <p>Advance notice: 2 Hours on weekdays, 15:30 the preceding day on weekends / Maximum number of interruptions per day: 1 / Minimum interval between interruptions: 16 hours / Maximum number of interruptions per winter period: 10 / Duration of interruption: 4-5 hours / Maximum duration of interruptions per winter period: 50 hours.</p>
Non-Firm Rate LD	<p>\$0.551 per kilowatt of billing demand per day for planned interruptions</p> <p>\$1.102 per kilowatt of billing demand per day for unplanned interruptions</p> <p>+</p> <p>Energy Charge 5.571¢/kWh</p> <p>Penalty: 51.967¢/kWh if power consumed when delivery has been refused.</p>	<p>Hydro-Québec offers a non-firm “Rate LD” to customers whose usual power source has temporarily failed. The non-firm “Rate LD” is a rate offered by Hydro-Québec for the delivery of backup power to customers whose normal source of power has failed temporarily, provided that the customer's normal independent production and minimum billing demand meet certain requirements.</p> <p>Customers who have a contract subject to non-firm rate LD must request delivery of electricity in advance, specifying the period and quantity needed. Hydro-Québec will review the request and may accept or deny it based on system availability. The customer may change the date of the request with reasonable notice. Hydro-Québec may also interrupt delivery of backup power on short notice. If the customer consumes electricity during a period when delivery has been refused, they will be charged a higher rate. The customer must pay all costs associated with the delivery of electricity under the non-firm option, and Hydro-Québec will not build new facilities or allocate existing facilities to guarantee availability of energy for backup loads.</p>

Utility Option	Rate	Conditions
Additional Electricity Option – Medium Customers ¹¹	<p>The price of the additional electricity, which includes both power and energy, is determined monthly and is based on Hydro-Québec Distribution's marginal supply costs.</p> <p>The rate cannot be lower than 5.810 cents per kilowatt-hour.</p> <p>Energy billed as additional electricity is calculated in 15-minute blocks.</p> <p>Consumption that exceeds the reference power is billed at the applicable price for additional electricity.</p> <p>The reference power and corresponding energy are billed at the prices and conditions in effect for Rate M or G9.</p>	<p>Hydro-Québec allows medium-power customers with Rate M or G9 rates to consume more electricity than usual during off-peak hours to meet short-term or exceptional needs. It is designed for customers who are able to adjust their production and manage their electricity consumption in a way that takes advantage of the Additional Electricity Option while working within its constraints.</p> <p>The option is available to customers whose maximum power demand was at least 500 kW during a consumption period within the previous 12 months. Hydro-Québec may prohibit the use of additional electricity on two hours' notice based on load management and system availability. Customers must submit a written request to Hydro-Québec at least 15 business days before the start of the consumption period for which they wish to use the option, and it will go into effect at the beginning of the following consumption period if Hydro-Québec approves and the appropriate metering equipment is installed. For subsequent consumption periods, customers must submit a written request at least five business days before the start of the period.</p>
Additional Electricity Option – Large Customers ¹²	<p>The price of the additional electricity, which includes both demand and energy, Determined monthly and reflects Hydro-Québec Distribution's marginal supply cost.</p> <p>The rate can not be lower than 4.787 cents per kilowatt-hour.</p> <p>The energy consumed as additional electricity is calculated and billed in 15-minute blocks.</p> <p>Consumption that exceeds the reference power is billed at the applicable price for additional electricity.</p> <p>The reference power and the rest of the energy are billed at Rate L or LG prices and conditions.</p>	<p>Hydro-Québec allows large-power customers with Rate L or LG rates to consume more electricity than usual during off-peak hours to meet short-term or exceptional needs. Hydro-Québec may prohibit the use of additional electricity on two hours' notice based on load management and system availability. Customers must apply to Hydro-Québec at least five business days before the start of the consumption period and must agree to adhere to the Additional Electricity Option for the entire consumption period.</p>

¹¹ “Additional Electricity Option for medium-power customers,” Hydro-Québec, <<https://www.hydroquebec.com/business/customer-space/rates/additional-electricity-option-medium-power-customers.html>>.

¹² “Additional Electricity Option for large-power customers,” Hydro-Québec, <<https://www.hydroquebec.com/business/customer-space/rates/additional-electricity-option-large-power-customers.html>>.

1 **iv. NB Power¹³**

2 NB Power currently offers an Interruptible Energy Charge and a Surplus Energy Charge for

3 non-firm energy provided to customers in excess of their reserved demand. These rates are

4 summarized in Table 4.

Table 4: NB Power Non-Firm Rates

Option	Rate	Conditions
Interruptible and Surplus Energy Charges	<p>On-peak price = incremental cost during on-peak hours + 0.9¢/kWh.</p> <p>Off-peak price = incremental cost during off-peak hours + 0.3¢/kWh.</p> <p>Incremental cost is defined as the incremental generation or purchased power cost after supplying in province firm load and other firm supply commitments.</p> <p>The on-peak period is defined as 0800 to 2400 hours Atlantic Prevailing Time on all weekdays, except statutory holidays. All other hours are considered to be off-peak.</p>	<p>NB Power will supply interruptible energy in excess of the demand reserved for the Customer up to the amount of the Customer's unused generation capability, if such energy is available at the Delivery Point, and can be provided with available resources over and above the requirement of other firm commitments.</p> <p>Surplus Energy is supplied only if it can be provided with available resources over and above the requirement of other firm commitments. The Customer must interrupt Surplus Energy use within ten (10) minutes of a request from NB Power. The rate will be based on NB Power's incremental cost of providing such energy.</p>

5 **Relationship to Export Sales**

6 Of the interruptible rates surveyed, BC Hydro rates for IPP considered the foregone export

7 sales. These rates use market data to price their interruptible energy rates. In addition to

8 interruptible rates for IPP customers, the Freshet and the pilot Incremental Energy Rate also

9 used market prices. These rates are based on the ICE in the ICE Day Ahead Power Price

10 Report.

¹³ NB Power has a Curtailable Power Credit of \$3 per kW per month. However, this rate option has been closed since April 1, 1999. "Rate Schedules and Policies – Effective Date: April 1, 2022," New Brunswick Power Corporation, <<https://nbeub.ca/uploads/NB%20Power%20Rate%20Schedules%20and%20Policies%20manual%20Effective%20April%201,%202022.pdf>>.

1 In Manitoba Hydro's SEP energy is "Typically [...] sourced from displaced exports with the
2 remainder of the energy supply coming from avoided spill."¹⁴ As part of the calculation to
3 determine the Energy Rates "If SEP energy displaces extra-provincial sales, the Energy
4 Charge shall be such as to collect the revenue that would have been received from the
5 foregone energy sales from the week to which the Energy Charge applies."¹⁵

6 It is evident that these utilities price their energy to recover forgone energy sales on the
7 external market.

8 **b)** In most cases, the non-firm rates provided by the reviewed utilities were designed to
9 recover the incremental cost of producing the surplus energy. Newfoundland and Labrador
10 Hydro ("Hydro") did not find any evidence that would indicate that any of the reviewed
11 utilities would be charged a different rate for surplus energy if the energy was sold either
12 inside or outside of the province in which the utility is located. Hydro would anticipate,
13 where appropriate, the opportunity to export would be considered in computing the
14 incremental cost.

15 **c)** In addition to the electrical utilities referenced in Schedule 1, Attachment 1,¹⁶ which
16 includes NB Power, BC Hydro, Hydro-Québec and Nova Scotia Power Inc. ("Nova Scotia
17 Power") that pay customers a credit to reduce their firm load, Newfoundland Power Inc.
18 also has a rate curtailment program in which a credit is given to customers that can reduce
19 their demand by between 300 kW (330 kVa) and 5,000 kW (5500 kVa) upon request by the
20 Company during the Winter Peak period.¹⁷

21 Manitoba Hydro also provides a curtailment program with a discount. The details are
22 provided in part a) of this response.

23 **d)** Based on the material reviewed by Hydro, there is insufficient information available to
24 calculate the price differential between Manitoba Hydro's surplus energy rates and the firm

¹⁴ "2023/24 & 2024/25 General Rate Application," The Manitoba Hydro-Electric Board, December 21, 2022, app. 8.18, p. 57 of 149.

<https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/gra_2023_2025/08-18_surplus_energy_annual_reports.pdf>

¹⁵ 2023/24 & 2024/25 General Rate Application," The Manitoba Hydro-Electric Board, December 21, 2022, app. 8.16, p. 25 of 25.

<https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/gra_2023_2025/08-16_surplus_energy.pdf>

¹⁶ "Application for a Non-Firm Rate for Labrador," Newfoundland and Labrador Hydro, September 15, 2022, sch.1, att. 1, sec. 5.1, pp. 9 of 24–11 of 24.

¹⁷ "Schedule of Rates Rules & Regulations, Effective July 1, 2022," Newfoundland Power Inc., p. 27.

<<https://newfoundlandpower.com/-/media/PDFs/My-Account/Usage/Rates-Rules-and-Regulations.pdf>>

1 rate. The surplus energy rate is based on continuously shifting market conditions. However,
2 according to the “Surplus Energy Program Annual Report” filed with Manitoba Hydro’s
3 2023/24 & 2024/2025 GRA:

4 The SEP is intended to be a revenue neutral program that offers customers
5 choice and access to surplus energy at prices that reflect Manitoba Hydro’s
6 short term marginal cost of energy. The SEP is not intended as a rate discount
7 program; however, energy market and supply conditions over the reporting
8 period were such that most SEP customers experienced a lower annual bill
9 when compared to service under the respective General Service firm rate.¹⁸

10 e) According to the “Surplus Energy Program” report filed with Manitoba Hydro’s 2023/24 &
11 2024/25 GRA:

12 Typically, the majority of SEP energy supply for the three pricing periods (On-
13 Peak, Shoulder and Off-Peak) is sourced from displaced exports with the
14 remainder of the energy supply coming from avoided spill. However, for the
15 November 1, 2020 to October 31, 2021 period, approximately 69% of the SEP
16 energy supply was sourced from displaced exports, with the remaining 31%
17 sourced from imports. None of the SEP energy was sourced from avoided spill
18 during the reporting period.¹⁹

19 In the material reviewed, there is insufficient evidence to determine the pricing differential
20 between the price of energy sold to the export market and the firm energy price.

21 f) The Surplus Energy price is based on the incremental cost of providing such energy.
22 Incremental cost is defined as the incremental generation or purchased power cost after
23 supplying in-province firm load and other firm supply commitments. Interruptible and
24 Surplus Energy prices are:

25 On-peak price = incremental cost during on peak hours + 0.9¢/kWh.

26 Off-peak price = incremental cost during off peak hours + 0.3¢/kWh.

¹⁸ “2023/24 & 2024/25 General Rate Application,” The Manitoba Hydro-Electric Board, December 21, 2022, app. 8.18, p. 57 of 149.

<https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/gra_2023_2025/08-18_surplus_energy_annual_reports.pdf>

¹⁹ “2023/24 & 2024/25 General Rate Application,” The Manitoba Hydro-Electric Board, December 21, 2022, app. 8.18, pp. 3–4 of 149.

<https://www.hydro.mb.ca/docs/regulatory_affairs/pdf/electric/gra_2023_2025/08-18_surplus_energy_annual_reports.pdf>

1 Hydro does not have the information to compare the price of exports to the price of surplus
2 energy.

3 **g)** Based on the information provided on the NB Power²⁰ website, NB Power exports (sells)
4 electricity to New England, Québec, Nova Scotia and Prince Edward Island through its
5 subsidiary, New Brunswick Energy Marketing.²¹

6 **h)** Hydro has not conducted a review of the relative difference between the firm energy cost
7 and the Intercontinental Exchange Inc. (“ICE”) market price used in computing the Freshet
8 rate. However, as indicated in Schedule 1, Attachment 2 of the Application,²² in recent years
9 marginal costs have been below the tail block price for firm rates.

10 The published BC Hydro information states:

11 The charge applied to energy supplied under this Rate Schedule 1892 during
12 each HLH and LLH of the current Freshet Period is equal to: 1. The greater of the
13 ICE Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price,
14 as published by the ICE in the ICE Day Ahead Power Price Report, applicable to
15 the hour, and \$0/kWh, plus 2. A \$3/MWh adder.²³

16 ICE is an American company that owns and operates financial and commodity marketplaces
17 and exchanges. "ELECTRICITY-MID C PEAK-ICE" means that the price for a Pricing Date will
18 be that day's Specified Price per MWh of on-peak electricity for delivery on the Delivery
19 Date, stated in U.S. Dollars, published by ICE at www.theice.com, under the headings
20 "Market Data: Indices: Market: ICE OTC: Report: North American Power: Hub: Mid C Peak"
21 or any successor headings, that reports prices effective on that Pricing Date.²⁴

22 **i)** Hydro does not know how much energy Hydro-Québec makes available to cryptocurrency
23 customers. Based on a literature review, Hydro believes Hydro-Québec was planning to
24 serve approximately 650 MW of capacity to cryptocurrency customers. Approximately

²⁰ New Brunswick Power Corporation (“NB Power”).

²¹ <<https://www.nbpower.com>>.

²² “Application for a Non-Firm Rate for Labrador,” Newfoundland and Labrador Hydro, September 15, 2022, sch. 1, att. 2, p. 7 of 19.

²³ Canada, (2017–2022), *Electric Tariff*, British Columbia Hydro and Power Authority.

<<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/tariff-filings/electric-tariff/bchydro-electric-tariff.pdf>>

²⁴ “Mid-Columbia Day-Ahead Peak Fixed Price Future,” Intercontinental Exchange Inc.,

<<https://www.theice.com/products/6590351/Mid-Columbia-Day-Ahead-Peak-Fixed-Price-Future>>.

1 300 MW was set aside for new projects. However, the current information on the Hydro-
2 Québec website states:

3 In light of the new energy context, Hydro-Québec has asked Québec's Régie de
4 l'énergie to approve suspension of the process for allocating capacity dedicated
5 to cryptographic use applied to blockchains while its request concerning the
6 reassessment of the number of megawatts involved is being processed. Any
7 new project related to the utilization of at least 50 kilowatts (kW) of installed
8 capacity for cryptographic use applied to blockchains will be subject to the price
9 of 15.590¢/kWh specified in Rate CB with regard to energy consumption, and
10 this price will apply to all the energy consumed under the service contract.²⁵

11 The Hydro-Québec website also states:

12 Hydro-Québec may curtail the real power demand under the contract to 5% of
13 the highest value recorded in the 12 previous months ending at the end of the
14 consumption period in question. It may do so on two hours' notice prior to the
15 start of any given curtailment period, for a maximum of:

- 16 • 100 hours for the rate year extending from April 1, 2021, to March 31, 2022;
- 17 • 200 hours for the rate year extending from April 1, 2022, to March 31, 2023;
- 18 • 300 hours for the rate year extending from April 1, 2023, to March 31, 2024,
19 and subsequent years.

20 The rate paid by cryptocurrency customers is the Large Power Rate for firm service.

21 Additional details on the Hydro-Québec rate for cryptocurrency customers are provided in
22 Schedule 1.²⁶ Hydro does not have the information available on the timing or limits on
23 customer rate increases.

24 **j)** Please refer to part i) of this response.

25 **k)** Please refer to part i) of this response.

²⁵ "Québec's blockchain industry," Hydro-Québec,
<<https://www.hydroquebec.com/blockchain/>>.

²⁶ "Application for a Non-Firm Rate for Labrador," Newfoundland and Labrador Hydro, September 15, 2022, sch, 1, att. 2,
p. 11 of 19.

- 1 I) Yes, Nova Scotia Power does offer a demand charge discount on interruptible demand in
 2 excess of contract demand. As per Nova Scotia Power’s website, included with the
 3 “Interruptible Rider to the Large Industrial Tariff,”²⁷ the demand discount is shown in Table 5.

Table 5: Nova Scotia Power – Interruptible Rider to the Large Industrial Tariff

Rate	Discount	Conditions
Demand Discount	Customers who qualify for interruptible service will receive a \$3.43 per month per kilovolt ampere reduction in demand charge for billed interruptible demand. The billed interruptible demand is defined as the difference between any contracted firm demand requirements and the total billing demand. Where the billing demand is less than the contracted firm demand, no interruptible credit shall apply. The billed interruptible demand will be the maximum interruptible demand of the current month or the maximum actual interruptible demand of the previous December, January or February occurring in the previous eleven (11) months.	<p>This rider will be available to a minimum regular billing demand of 2000 kVA at 90% Power Factor, under the following terms and conditions:</p> <p>The customer has provided written notice of his desire to take service under this option, identifying that portion of the load that is to be firm and that portion that is to be interruptible (minimum 2000 kVA).</p> <p>The customers will reduce their available interruptible system load by the amount requested by NSP within ten (10) minutes of such request by the Company.</p> <p>Following interruption, service may only be restored by the customer with approval of the Company.</p> <p>Failure to comply in whole or in part with a request to interrupt load will result in penalty charges. The penalty charge shall be twice the cost of the appropriate firm billing effective at that time for the consumption used in that billing period.</p> <p>Should any customer under this rider desire to be served under any appropriate firm service rate, a five (5) year advance written notice must be given to the Company so as to ensure adequate capacity availability. Requests for conversion to firm service will be treated in the same manner as all other requests for firm service received by the Company. The Company may, however, permit an earlier conversion. In the event that the Customer desires to return to interruptible service in the future, the Customer may convert to interruptible service following two (2) years of service under the firm tariff. The Company may permit an earlier conversion from firm to interruptible service.</p> <p>Interruption is limited to 16 hours per day and 5 days per week to a maximum of 30% of the hours per month and 15% of the hours in a year.</p>

²⁷ “Interruptible Rider To The Large Industrial Tariff,” Nova Scotia Power Inc., <<https://www.nspower.ca/about-us/producing/rates-tariffs/interruptible-rider#:~:text=Demand%20Discount,and%20the%20total%20billing%20demand>>.

1 **m)** As indicated in Schedule 1 of Hydro’s application, “the pricing of non-firm energy reflecting
2 the incremental cost of supply is the most common approach among Canadian utilities that
3 have rates in effect to sell surplus or additional energy.”²⁸ Incremental cost can be either
4 internal costs or market value. As provided in Hydro’s response to part h), the BC Hydro
5 Freshet Rate specifically uses a forecast market price in computation of the rate. Also, the
6 Surplus Energy Program at Manitoba Hydro requires the incremental cost for the energy
7 rate to be determined weekly based on either displaced exports, Manitoba Hydro
8 generation, or imports.

9 For additional information on non-firm rate practices in other jurisdictions, please refer to
10 the report “Review and Analysis of Non-Firm Rate Design Alternatives” prepared by
11 Christensen Associates Energy Consulting, LLC (“CA Energy Consulting”) provided in
12 Schedule 1, Attachment 2.²⁹

13 **n)** Please refer to part m) of this response.

14 **o)** As stated in the report provided by CA Energy Consulting,³⁰ there are limited rates designs
15 for non-firm energy in the United States of America.

16 **p)** A network grid has less requirements for non-firm arrangements than a radial grid as there
17 are often different routes for customers to access firm power; most customers would prefer
18 firm power to non-firm power.

19 **q)** Hydro isn’t aware if the utilities mentioned on Slide 12³¹ are radial or network in nature.
20 Please refer to Hydro’s response to part a) for general rate information.

21 **r)** Hydro closely manages the hydraulic resources with storage capability on the Island
22 Interconnected System. Regular assessments of storage at a reservoir level basis are
23 completed to ensure that system energy in storage remains above the established minimum
24 storage limit and under the maximum operating level. If a reservoir is high or projected to

²⁸ “Application for Non-Firm Rate for Labrador,” Newfoundland and Labrador Hydro, September 15, 2022, sch. 1, sec. 1.0, p. 2/16–17.

²⁹ “Application for Non-Firm Rate for Labrador,” Newfoundland and Labrador Hydro, September 15, 2022, sch. 1, att. 2.

³⁰ “Application for Non-Firm Rate for Labrador,” Newfoundland and Labrador Hydro, September 15, 2022, sch. 1, att. 2, p. 12 of 19.

³¹ “Non-Firm Rate Application – Information Session for Interested Parties,” Newfoundland and Labrador Hydro, November 30, 2022.

- 1 spill, generation at that reservoir is maximized to the extent possible to manage the risk of
2 spill and mitigate potential spill quantities. Hydro also has the ability to engage Nalcor
3 Energy Marketing Corporation to export energy on its behalf to aid in the mitigation of spill
4 pursuant to the Pilot Agreement for the Optimization of Hydraulic Resources. Exporting
5 when system load is low allows for sustained generation from the Island hydraulic facilities
6 and the utilization of water (energy) that could otherwise have been spilled, while not
7 increasing the risk of spill elsewhere in the system. Hydro files a Monthly Energy Supply
8 Report with the Board of Commissioners of Public Utilities each month that describes the
9 status of the Island Interconnected System hydrology storage position.
- 10 s) The approved cost of service methodology and rate designs used by Hydro does not
11 designate any of its current power supply as “heritage” pool electricity.