

REQUESTOR NAME: Clean Energy Association of B.C. (CEABC)

INFORMATION REQUEST ROUND NO: #4

TO: BRITISH COLUMBIA HYDRO & POWER AUTHORITY

DATE: October 30, 2019

PROJECT NO: 1598990 / Order G-45-19

APPLICATION NAME: F2020-F2021 Revenue Requirements Application (“F20-21 RRA” or “RRA”)

54. Reference: Exhibit B-19, Evidentiary Update (un-redacted), Figures 2 and 3, and Appendix A, Schedule 4.0.

In Figure 2, BC Hydro describes the changes in Volumes of Supply as between the volumes in the original Application (Exhibit B-1) and those in the Evidentiary Update for F2020 and F2021.

54.1 Please confirm that +3,600 for Market Electricity Purchases in F2020 indicates an increase in purchases, but the +2,325 captioned “*Less Surplus Sales*” means there will be a reduction in surplus sales. I.e. that positive numbers have the effect of increasing electricity supply and negative numbers reduce the total supply.

54.2 Since these numbers represent the changes relative to the original forecast in the Application, please confirm that the final forecast numbers (as shown on lines 8 and 9 of Appendix A, Schedule 4.0) will now be:

Surplus Sales F2020 = 84 GWh and F2021 = 2,065 GWh

Market Purchases F2020 = 5,104 GWh and F2021 = 1,326 GWh

55. Reference: Exhibit B-19, Evidentiary Update (un-redacted), Appendix A, Schedule 4.0.

Line 1 of Schedule 4.0 forecasts the GWh of BC Hydro generation subject to provincial water rental rates. It shows that the original forecast for F2019 was for generation of 46,368 GWh, but the actual generation was substantially less, at only 42,341 GWh, and the current forecast for F2021 is for an even lower generation of only 39,368 GWh. However, the generation for F2021 is expected to rebound to 44,522 GWh.

55.1 When was the original forecast for F2019 done, that indicated 46,368 GWh? Was this based on a year of average water flows? If not, what assumption was made about the percentage of average water flows in the two major river systems?

55.2 The original F2019 forecast in the Application showed 42,340 GWh and this was almost exactly in agreement with the Actual shown in the Evidentiary Update (42,341). Please confirm that the Application forecast was based on the October 2018 Energy Study, and that this proved to be very accurate in predicting the generation up until March 31, 2019. What assumption was made about F2019 water flows for the October 2018 Energy Study?

55.3 The October 2018 Energy Study was forecasting an improvement in hydro generation for F2020 and F2021 (to 44,262 and 44,999 GWh, respectively). What was the assumption being made at that time about the expected percentage of average water flows in F2020 and F2021?

55.4 In June 2019, however, the new Energy Study greatly reduced the expected generation for F2020 (to 39,368 GWh), but only slightly reduced it for F2021 (to 44,522 GWh). What

happened to water flows between April 1, 2019 and June, 2019 that caused BC Hydro to so drastically reduce the forecast generation for the entire F2020 year (a reduction of almost 4,900 GWh when compared to the forecast done as recently as October 2018, and of 7,000 GWh when compared to the original F2019 forecast)?

- 55.5 What assumption is now being made about the percentage of average water flows, in the two major river systems, that is expected for the full F2020 year?
- 55.6 What assumption is now being made about the percentage of average water flows, in the two major river systems, that is expected for the full F2021 year?
- 55.7 To what extent, if any, has the level in Williston reservoir been drawn down, or will it be drawn down to facilitate the construction of the Site C project?

56. Reference: Exhibit B-19, Evidentiary Update (un-redacted), Appendix C, Cost of Heritage Energy, and Appendix A, Schedule 4.0.

In Section 1.1, BC Hydro states that the “*Total costs for Non-Treaty Storage and Libby Coordination Agreements are forecast to \$11.7 million higher in fiscal 2020 and \$9.3 million lower in fiscal 2021...*”

And line 26 of Schedule 4.0 shows that the total amounts are now forecast to be \$15.0 million for F2020 and (\$11.7) million for F2021. The Actual amount for F2019 is shown as (\$181.9) million.

- 56.1 Is line 26 used to show either a cost (as for the positive value in F2020) or a benefit (as indicated by the negative amounts in F2021 and F2019)? Or is the benefit shown somewhere else? If so, where else?
- 56.2 Please explain how costs or benefits arise from these agreements. In particular, how did the exceptionally large revenue arise in F2019? And why is F2020 expected to show a net cost?

57. Reference: Exhibit B-19, Evidentiary Update (un-redacted), Appendix C, Cost of Non-Heritage Energy, and Appendix A, Schedule 4.0.

In Section 1.2, BC Hydro states that the forecast total costs for IPPs and Long-Term Commitments have been reduced from the original Application amounts by \$243.8 million in F2020 and by \$190.3 million F2021. Schedule 4.0 shows that the Actual cost in F2019 was lower than forecast by \$192.1 million. BC Hydro states that these reductions are “*due to a number of factors...*” and enumerates four different factors.

- 57.1 What are the “*Long-Term Commitments*” that are included in this category, and how much of the total costs do they account for in each year?
- 57.2 Please provide a breakdown of the amounts of the cost reductions that are due to each of the four listed factors in each of the years F2019, F2020, and F2021.
- 57.3 In the case of the adjustment for IFRS 16, is it only the costs that are removed from line 29 of Schedule 4.0, while the GWh volumes are still included in line 5 under “*IPPs and Long-Term Commitments*”?
- 57.4 Line 5 of Schedule 4.0 shows a shortfall in GWh from IPPs for each of the 3 years F2019 to F2021 (shortfalls of 951, 1500, and 802 GWh for the three years, respectively. How much of the shortfall of IPP energy in each year was due to “*Lower forecast inflows for hydro IPPs due to dry weather conditions*”?

58. Reference: Exhibit B-15, 20-Year Load Forecast, and Exhibit B-13, BC Hydro’s response to CEABC IR 2.41.

In its response to CEABC IR 2.41.1, BC Hydro stated:

The information provided below also responds to the entire CEABC IR 2.41 series.

This IR series asks BC Hydro to explain the lower service percentage forecast of shale gas production and processing in each of the five Montney shale basin areas served by BC Hydro in the October 2018 Load Forecast compared to the December 2012 Load Forecast.

BC Hydro notes that the December 2012 Load Forecast was produced six years ago and is therefore out-dated. Consequently any direct comparison between this forecast and the October 2018 Load Forecast beyond fiscal 2024 is not meaningful. BC Hydro will be filing an updated 20-year load forecast as part of this proceeding on October 3, 2019. [underlining added]

In its response, BC Hydro provided Tables 1 and 2, and an excellent summary of the industry activities in the 5 regions of the Montney basin, and of BC Hydro’s expected service percentages. However, the analysis was based on the previous load forecast (October, 2018), which did not go beyond F2024.

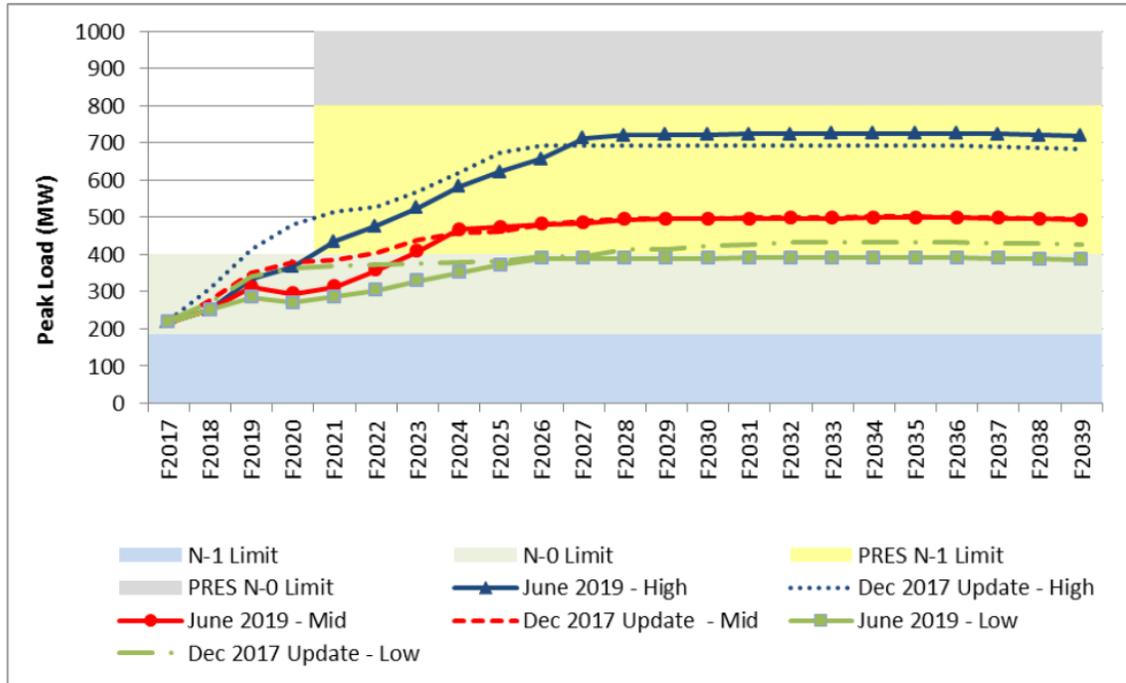
In its response, BC Hydro cited “*the main reason*” for its declining service percentage was the decline in natural gas prices, from \$4.15/MMBtu in 2012 to \$1.50/MMBtu in 2018, stating that: “*This decline impacts the relative competitiveness of electricity versus natural gas to provide work energy requirements.*”

- 58.1 Since the Table 1 and Table 2 format provided a very useful and understandable synopsis, please update and augment Tables 1 and 2, and the associated discussion, to include all the new information that informed the new 20-Year Load Forecast (June, 2019), that includes projections going beyond F2024. In the associated discussion, please describe the main factors that result in material changes from the October 2018 Load Forecast.
- 58.2 For the Dawson Creek and Groundbirch areas, that contain the new PRES transmission line, how much of the change in service percentages (between the October 2018 and June 2019 Load Forecasts) result from the construction of the PRES transmission line?
- 58.3 If a North Montney transmission project is developed, what impact could it have on the service percentages in the 5 Montney regions, in particular the GM Shrum area?
- 58.4 To what extent will an increasing carbon tax offset the decline in gas prices? How much will a \$50/tonne carbon tax add to a gas producer’s cost per MMBtu of natural gas? How many MMBtus of natural gas are required to generate one MWh of work energy in the gas processing plants? (i.e. what is the fuel efficiency of the gas-fired compressors that deliver the work energy?)

59. Reference: Exhibit B-15, 20-Year Load Forecast, Appendix C, June 2019 update to South Peace River forecast.

In Appendix C, BC Hydro provides the following chart to illustrate the differences between the previous (May 2016) and the latest (June 2019) Load Forecast for the area to be serviced by the PRES project:

**Figure C-1 South Peace Region Load Forecasts
June 2019 and December 2017 Update**



The chart appears to show the Mid Forecast of Peak Loads reaching around 500 MW by F2024, and the High Forecast of Peak Loads reaching around 700 MW by F2027. These are approximately the same levels as were forecast in May 2016, except that the newer High Forecast reaches a level about 20 MW higher, which BC Hydro describes as “due to increased electrification assumptions in the Groundbirch area as a result of LNG development.”

- 59.1 When will the PRES project be completed and in service?
- 59.2 What are the average MW loads that BC Hydro would expect to correspond to the Mid and High Peak Loads shown in the forecast chart?
- 59.3 Please provide a table listing all of the customer facilities in the area, that could be serviced by the PRES project (whether or not they have requested service to date), including both existing and planned facilities (indicate a projected in-service date, if planned). Indicate the type of each facility (e.g. gas processing, shallow cut, etc.); the operating capacity and average production rate from each facility; the total work energy that will be consumed by each facility operating at its average production rate; how much BC Hydro service each facility has requested to date, and how much service is assumed in the Mid and High June 2019 Forecasts.
- 59.4 As a proportion of the total work energy to be consumed by all the existing and planned facilities in the area, what proportion is represented by BC Hydro’s June 2019 High Forecast for F2027?
- 59.5 What steps can BC Hydro take to electrify a higher proportion of the total work load in the PRES area? What, if any, actions is BC Hydro undertaking to accomplish this?

60. Reference: Exhibit B-15, 20-Year Load Forecast, Section 1, page 3, expected annual load growth.

On page 3, BC Hydro states that this latest 20-Year Load Forecast “Expects annual load growth of approximately 1 per cent for fiscal 2020 to fiscal 2039.”

60.1 How does this 1% growth expectation compare to that of other electric utilities in jurisdictions across Canada and the U.S.? Which of these other utilities have a carbon tax similar to British Columbia's or a low carbon electrification plan similar to the CleanBC Plan designed to also allow the major expansion of a fossil fuel export industry such as LNG in B.C.?

61. Reference: Exhibit B-15, 20-Year Load Forecast, page 3, expected annual load growth, and the Clean Energy Act of B.C.

The Clean Energy Act has been the law in British Columbia for about 9 years. The following objectives are excerpted from the Act:

"2. The following comprise British Columbia's energy objectives:

(c) to generate at least 93% of the electricity in British Columbia from clean or renewable resources and to build the infrastructure necessary to transmit that electricity;

(g) to reduce BC greenhouse gas emissions

(i) by 2012 and for each subsequent calendar year to at least 6% less than the level of those emissions in 2007,

(ii) by 2016 and for each subsequent calendar year to at least 18% less than the level of those emissions in 2007,

(iii) by 2020 and for each subsequent calendar year to at least 33% less than the level of those emissions in 2007,

(iv) by 2050 and for each subsequent calendar year to at least 80% less than the level of those emissions in 2007, and

(v) by such other amounts as determined under the [Climate Change Accountability Act](#);

(h) to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia;"

61.1 Is BC Hydro's 1% load growth expectation, over the next 20 years, consistent with the Clean Energy Act's objectives for GHG reductions, or its objective for switching energy sources to a source "that decreases greenhouse gas emissions in British Columbia"? If not, why not?

61.2 What does BC Hydro perceive as its role in achieving the objectives of the Clean Energy Act? How is this role being reflected in the current 20-Year Load Forecast?

62. Reference: Exhibit B-15, 20-Year Load Forecast, and Mandate letter from the Minister of Energy, Mines and Petroleum Resources.

On February 21, 2019, the Minister sent a Mandate Letter to the Chairman of BC Hydro. In that letter, the Minister stated the following Government intentions regarding its climate strategy:

*"While Government has already taken steps towards achieving our legislated carbon reduction targets, much remains to be done. Our new climate strategy will outline **significant GHG reduction measures in 2019/20** while supporting our program and service objectives through economic growth powered by clean, renewable energy. The full scope of actions envisioned in CleanBC – on the part of citizens, industry and business, and local and provincial government – will accomplish our 2030 GHG reduction goals. This plan describes specific reductions from the first set of actions totaling more than 75 per cent. Over the next 18 to 24*

months supported by technological innovation. Please ensure your organization's operations align with Government's new climate plan;" [emphasis added]

62.1 How does the 1% 20-year load growth featured in the June 2019 Load Forecast "*align with Government's new climate plan*"?

62.2 What BC Hydro electrification loads are included in this new Load Forecast that will support the Government's new climate plan in accomplishing its 2030 GHG reduction goals?

63. Reference: Exhibit B-15, 20-Year Load Forecast, and BC Hydro's 2019/20 – 2021/22 Service Plan dated February, 2019.

BC Hydro has declared the following goal in its latest Service Plan, dated February, 2019:

Goal 4: Help Make Renewable, Clean Power British Columbia's Leading Energy Source

Objective 4.1: BC Hydro will strengthen its legacy of renewable, clean power and conservation investments through its energy-efficiency and conservation programs, capacity reduction initiatives and support of low-carbon electrification.

Key Strategies:

- Support the implementation of the CleanBC plan to increase British Columbians' use of cleaner energy in key sectors of the economy and shift away from reliance on fossil fuels for transportation, industry, and housing.
- Support customers with initiatives that help them make smart energy management choices with conservation, efficiency, capacity reduction and low carbon electrification.
- Implement our energy conservation and energy management plan, which will exceed the *Clean Energy Act* requirement to meet at least two-thirds of future demand growth by 2020.
- Provide customers with the opportunity to access clean, renewable power to displace the use of higher carbon energy sources.
- As part of the CleanBC plan, partner with the Province and the federal government to implement a new Remote Community Clean Energy Strategy to help remote communities, with a focus on Indigenous communities, reduce or eliminate diesel generation and replace it with energy from cleaner sources.

63.1 How is the June, 2019 Load Forecast consistent with BC Hydro supporting British Columbians to "*shift away from reliance on fossil fuels for transportation, industry, and housing*"? How much new load is included in the June, 2019 Load Forecast as a result of implementing this Key Strategy?

63.2 How much new load growth is included in the June, 2019 Load Forecast that supports customer initiatives for low carbon electrification? How many incremental GWh does this new load growth contribute by F2024? By F2030? By F2040?

63.3 What is the amount of new load growth included in the June, 2019 Load Forecast represented by BC Hydro's customer opportunities to "*to access clean, renewable power to displace the use of higher carbon energy sources*"?

64. Reference: On August 29, 2019, the Governments of Canada and B.C. announced an MOU aimed at the electrification of B.C.'s natural gas sector.

https://news.gov.bc.ca/files/MOU_Canada_BritishColumbia_Natural_Gas_Electrification.pdf

The following is an excerpt from that MOU:

Purpose

1. The purpose of this Memorandum of Understanding is to demonstrate the commitment of the Government of British Columbia and the Government of Canada to support the electrification of the natural gas sector in British Columbia.

Joint actions

2. The participants agree on the importance of supporting the electrification of the natural gas sector in British Columbia.
3. A Canada-British Columbia Clean Power Planning Committee, with senior representation from both jurisdictions, including BC Hydro will:
 - a. Advance natural gas and liquified natural gas electrification, including:
 - i. CleanBC Facilities Electrification Fund;
 - ii. Bear Mountain to Dawson Creek Voltage Conversion project;
 - iii. North Montney Power Supply project; and
 - iv. Other natural gas electrification opportunities identified by the participants
 - b. Explore other electrification and transmission expansion opportunities, as determined by the Committee;
 - c. Improve cross-government coordination to connect existing and new funding sources to priorities, especially with respect to federal infrastructure funding; and
 - d. Develop and consider new and/or alternative financing models that can advance priority transmission projects, which may include Indigenous or other private sector ownership and participation by the Canada Infrastructure Bank.

BC Hydro is named as having “*senior representation*” on the Clean Power Planning Committee that is driving this initiative.

- 64.1 Is BC Hydro’s expected 1% load growth over the next 20 years consistent with the objectives stated in this Canada-B.C. MOU? If not, why not? What is BC Hydro planning to do to achieve the objectives of the MOU?
- 64.2 What is the “*North Montney Power Supply project*” identified as item 3.a.iii. in the MOU? Is this project the same as the “*North Montney – Transmsission Development*” project identified in the response to BCUC IR 2.254.2? To what extent are they the same or different? What are their respective objectives? How much capital has BC Hydro budgeted for these projects? When are they expected to be complete and in-service? How much additional load does BC Hydro expect to serve through these projects, and in what years is that additional load included in the June 2019 20-Year Forecast?
- 64.3 What “*Other natural gas electrification opportunities*” has BC Hydro identified? How much capital and expenses are budgeted for them? When will they be completed and in-service? How much additional load does BC Hydro expect to serve through these opportunities, and is that additional load included in the June 2019 20-Year Forecast?

65. Reference: Exhibit B-15, 20-Year Load Forecast, and news announcement from Petronas re its plans for LNG exports.

Petronas Canada described its plans for gas expansion activities in Northeast B.C. in this news article November 28, 2018.

<https://www.alaskahighwaynews.ca/business/petronas-plans-gradual-ramp-up-electrification-in-northeast-b-c-1.23511710>

The article stated that:

“Petronas Canada plans to electrify its operations in Northeast B.C. as it reaccelerates its drilling program and brings spending to \$1 billion a year by 2022...

The company plans to build slowly from there in 2019, with two rigs to drill 30 wells and boosting spending to just under \$500 million. By 2022, it plans to have up to six rigs in the region drilling up to 80 wells, with spending reaching \$1 billion...

Around 63 trillion cubic feet of Petronas’ reserves are recoverable with today’s technology, Deyell said. Of that, 7 tcf will be sent west to the LNG Canada project in Kitimat, in which Petronas bought a 25% share in May...

Petronas has recently committed to the federal government to lead the development of an electrification plan in Northeast B.C., Deyell said. The company will be working with all levels of government, First Nations, and the public in the new year on that plan, she said.”

65.1 What steps is BC Hydro taking to ensure that as much as possible of Petronas’ gas operations in Northeast B.C. will be electrified?

65.2 Given the short time frame for Petronas’ activities e.g. phase one of LNG Canada is expected to be in commercial operation by 2025, how will BC Hydro meet the need for the electrification of Petronas’ facilities? How much of this new load has BC Hydro included in the June 2019 Load Forecast, and in which years?

66. Reference: Exhibit B-15, 20-Year Load Forecast, Appendix D, Load Resource Balances, Table D-3, Demand Side Management and Other Measures.

Table D-3 now gives a picture of the 20 year outlook for DSM and other measures, but there is no discussion of how these 20 year forecasts are determined.

Under “*Existing and Committed*” measures, the table shows “*F19 DSM Portfolio Savings (F20-F21 RRA)*”, which decline from 695 GWh of savings in F2021 to 401 GWh in F2039.

66.1 How is it that these Portfolio Savings have such a long period of decline, when most DSM programs are viewed as losing their effectiveness over no more than 10 years?

66.2 Are these savings based on existing programs where all the costs have already been incurred, or will new costs be incurred over the 20 year period?

Also under “*Existing and Committed*” measures, the table shows “*F20+ Codes & Standards (F20-F21 RRA) plus Voltage and VAR Optimization*”, which increases from 615 GWh of savings in F2021 to 3,750 GWh in F2039.

66.3 Please itemize each of the items that comprise this line, and provide a breakdown of the savings from each and the spending on each over the time period.

66.4 Please explain how these listed items are expected to produce such significant savings over such a long period.

Under “*Planned*” DSM Measures, the table shows “*F20+ Rates (F20-F21 RRA)*”, which increases from 381 GWh of savings in F2021 to 1,615 GWh in F2039, and it also shows “*F20+*

Programs (F20-F21 RRA)”, for which the savings are more or less constant from 128 GWh in F2021 to 135 GWh in F2039.

- 66.5 Please itemize what is included in these “*Rates*” and “*Programs*” lines, describe each item, and provide a breakdown of the savings from each and the spending on each over the time period.
- 66.6 Please explain how the “*Rates*” items are expected to produce such significant savings and to last for such a long period.
- 66.7 Please explain how the “*Program*” savings can be expected to last for 20 years without declining to zero.