Fred James
Chief Regulatory Officer
Phone: 604-623-4046
Fax: 604-623-4407
bchydroregulatorygroup@bchydro.com

January 17, 2020

Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

RE: Project No. 1598990
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Fiscal 2020 to Fiscal 2021 Revenue Requirements Application

BC Hydro writes to provide a public version of Appendix B of its Rebuttal Evidence and to provide revised responses to four previously submitted information requests.

Appendix B of BC Hydro's Rebuttal Evidence contained a report from S&P Global Market Intelligence. The report includes a table showing a large sample of utilities and whether those utilities have full or partial decoupling mechanisms (i.e., a mechanism that enables utilities to offset the effect on revenues of fluctuations in sales caused by customer participation in energy efficiency programs, deviations from "normal" temperature patterns, or economic conditions.). Approximately half of the utilities included in the report utilize some type of decoupling mechanism.

BC Hydro filed this report in confidence with the BCUC only because it was obtained through a paid subscription service. Subsequent to this filing, S&P Global Market Intelligence advised BC Hydro that it was possible to share this report publicly.

In addition, while responding to Information Request No. 2 from the BCUC Panel and preparing for the Oral Hearing, BC Hydro identified minor errors in four previous responses to information requests.

Accordingly, BC Hydro writes to provide its revised Rebuttal Evidence and revised responses to information requests as follows:

Exhibit B-5-2	Revision to Round 1 BCUC IR 1.164.1
Exhibit B-6 -2	Revision to Round 1 BCOAPO 1.16.2
Exhibit B-12-2	Revision to Round 2 BCUC IR 2.267.1
Exhibit B-23-4	Revision to Round 4 CEABC IR 4.58.4
Exhibit B-28-2	Revision to Rebuttal Evidence

For further information, please contact Chris Sandve at 604-974-4641 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

(for) Fred James
Chief Regulatory Officer

cs/rh

Enclosure

58.0 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."*

4.58.4 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?)

ORIGINAL RESPONSE:

All other factors being equal, increasing the carbon tax will increase the cost of self-supplying work energy requirements using natural gas relative to the cost of electricity supply.

To answer the specific questions in this information request, BC Hydro used the following assumptions:

- **1 MMbtu natural gas burned produces 0.053 tonnes CO_2;**
- **3.4121 MMbtu/hr energy = 1 MWh electrical energy; and**
- **Average natural gas turbine conversion efficiency of 29.5 per cent.**

Using the above assumptions:

- **A $50/tonne carbon tax will add $2.65 per MMbtu natural gas burned (i.e., $50/tonne x 0.053 tonnes/MMbtu = $2.65/MMbtu).**
- **1 MWh of work energy will require 11.57 MMbtu natural gas (i.e., 3.412 MMBtu/h/1 MWh x 1/0.295 energy conversion efficiency = 11.57 MMbtu/MWh).**
- **$50/tonne x 0.053 tonnes/1MMbtu natural gas burned x 1 MWh/3.412 MMBtu/h x 1/0.295 energy conversion efficiency = $2.63 per MWh work energy.**

REVISED RESPONSE:

All other factors being equal, increasing the carbon tax will increase the cost of self-supplying work energy requirements using natural gas relative to the cost of electricity supply.

To answer the specific questions in this information request, BC Hydro used the following assumptions:

- **1 MMbtu natural gas burned produces 0.053 tonnes CO_2;**
- **3.4121 MMbtu/hr energy = 1 MWh electrical energy; and**
- **Average natural gas turbine conversion efficiency of 29.5 per cent.**

Using the above assumptions:

- **A $50/tonne carbon tax will add $2.65 per MMbtu natural gas burned (i.e., $50/tonne x 0.053 tonnes/MMbtu = $2.65/MMbtu).**
- **1 MWh of work energy will require 11.57 MMbtu natural gas (i.e., 3.412 MMBtu/h/1 MWh x 1/0.295 energy conversion efficiency = 11.57 MMbtu/MWh).**
- **$50/tonne x 0.053 tonnes/1MMbtu natural gas burned x ~~1 MWh/~~3.412 MMBtu/h/1 MWh x 1/0.295 energy conversion efficiency = $~~2.63~~30.66 per MWh work energy.**