BC Hydro
Power smart

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October 24, 2019

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. 1599038
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Application for 2019 Letter Agreement with Powerex Corp.

BC Hydro writes in compliance with Commission Order No. G-243-19 to provide its responses to Round 1 information requests (**IRs**) as follows:

Exhibit B-4	Responses to Commission IRs (Public Version)
Exhibit B-4-1	Responses to Commission IRs (Confidential Version)
Exhibit B-5	Responses to Interveners IRs
Exhibit B-6	Responses to Commission Confidential IRs (Confidential)

BC Hydro also provides submissions on further process, as contemplated by that Order. BC Hydro has also prepared amendments to its draft Order to address three issues that became apparent in the course of preparing the IR responses.

BC Hydro is filing the response to BCUC IR 1.5.1 confidentially with the Commission. BC Hydro confirms that an explanation for the request for confidential treatment is provided in the public version of the IR response. BC Hydro seeks this confidential treatment pursuant to section 42 of the *Administrative Tribunals Act* and Part 4 of the Commission's Rules of Practice and Procedure.

First, a number of IRs (including BCUC IR 1.6.4) were issued in regard to the time horizon within which BC Hydro would employ the 2019 Letter Agreement. In particular, there seemed to be a potential concern that BC Hydro might use the 2019 Letter Agreement to procure forward physical electricity outside the operational time horizon, and potentially use it to manage its electricity requirements in the planning horizon. That concern arises because the 2019 Letter Agreement does not specify a maximum Delivery Term (as defined).

To address that concern, BC Hydro commits that it will not specify Delivery Terms greater than three years in its Purchase Interest Requests, as set out in its response to BCUC IR 1.6.4. BC Hydro has reflected this commitment in a revised draft Order (black-line, attached).

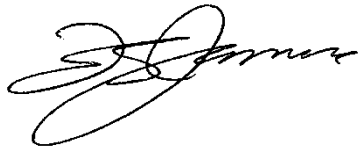
Second, a number of IRs (including BCUC IR 1.6.2) sought to clarify whether BC Hydro could amend the Contract Price to allow for a price other than a wholesale market price. This concern arises because of the language in the 2019 Letter Agreement that gives the parties a broad right to amend the Contract Price. To clarify the intent of the parties in including this language in the 2019 Letter Agreement, BC Hydro has made commitments regarding this amendment right in its response to BCUC IR 1.6.2 which it wishes to confirm. Specifically, BC Hydro commits that it will not amend the Contract Price other than as follows: 1) if the estimate of the fixed and variable transmission costs are no longer reasonable; and 2) to change the wholesale market price to a different wholesale market price if the original is no longer published. BC Hydro has also reflected that commitment in a revised draft Order (black-line, attached).

Lastly, a number of IRs were issued regarding the reporting that BC Hydro proposed in its Application. BC Hydro acknowledges that its description of proposed reporting was unclear. To confirm, BC Hydro proposes to provide a public report that is consistent with Directive 3(a) of BCUC Order E-15-19 regarding the 2018 Letter Agreement (**BCUC 2018 Order**). Specifically, BC Hydro will file, 90 days after the end of each calendar quarter, a public report that specifies the Transactions (as defined in the 2019 Letter Agreement) that occurred during the relevant calendar quarter. BC Hydro confirms that it does not propose to continue the reporting requested in Directives 3(b) to 3(d) of the BCUC 2018 Order because BC Hydro manages its system on a portfolio basis and is therefore not able to generate the information requested. Finally, BC Hydro confirms it will continue filing monthly reports to monitor water levels and inflows at each of the Kinbasket and Williston reservoirs pursuant to Directive No. 4 of the BCUC 2018 Order. BC Hydro has reflected this correction in a revised draft Order (black-line, attached) as well.

In regards to process, BC Hydro submits that no further evidentiary process in regard to the 2019 Letter Agreement is required. Instead, and as noted on page 11 of the August 2, 2019 Application, BC Hydro proposes that the Commission invite submissions from interveners on the narrow question whether the 2019 Letter Agreement can be declared to be in the public interest and accepted for filing or, alternatively, whether some material doubt arises in regard to the proposed request for acceptance such that a full hearing is necessary. Assuming the Commission invites submissions from interveners on this question, then BC Hydro expects it would have a right of reply.

For further information, please contact the undersigned.

Yours sincerely,



Fred James
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Enclosure

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ORDER NUMBER
G-xx-xx

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

British Columbia Hydro and Power Authority (BC Hydro)
Letter Agreement with Powerex Corp. – Forward Electricity Purchases

BEFORE:
Commissioner
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

A. On August 2, 2019, pursuant to section 71 of the *Utilities Commission Act* (UCA), British Columbia Hydro and Power Authority (BC Hydro) filed with the British Columbia Utilities Commission (BCUC) a letter agreement date June 6, 2019, (2019 Letter Agreement) between BC Hydro and Powerex Corp. (Powerex) that provides for the forward delivery and sale of electricty from Powerex to BC Hydro (altogether the Application);

B. By Order G-61-12, dated May 17, 2012, the BCUC established the Rules for Energy Supply Contrcats (ESC) for Electricity (Rules). The Rules are intended to facilitate the BCUC's review of ESCs and proposed ESCs for electricity;

C. BC Hydro requested that certain information contained in the 2019 Letter Agreement be kept in confidence pursuant to Part IV of the Commission's Rules of Practice and Procedure;

D. In its Application BC Hydro sought a determination that the 2019 Letter Agreement is in the public interest and an order accepting it for filing;

E. In response to informations requests regarding the 2019 Letter Agreement, BC Hydro commited that it would not specify Delivery Terms (as defined in the 2019 Letter Agreement) greater than three years, consistent with the operational time horizon within which the agreement is meant to be used (the Delivery Term Commitment);

F. In response to informations requests regarding the 2019 Letter Agreement, BC Hydro commited that it would not amend the Contract Price other than as follows: 1) if the estimate of the fixed and variable transmission costs are no longer reasonable; and 2) to change the wholesale market price to a different wholesale market price if the original is no longer published;

DRAFT

G. In its Application BC Hydro proposed reporting obligations with respect to the 2019 Letter Agreement. BC Hydro proposed to provide a public report that is consistent with Directive 3(a) of BCUC Order E-15-19 regarding the 2018 Letter Agreement (BCUC 2018 Order). Specifically, BC Hydro will file, 90 days after the end of each calendar quarter, a public report that specifies the Transactions (as defined in the 2019 Letter Agreement) that occurred during the relevant calendar quarter. BC Hydro confirms that it does not propose to continue the reporting requested in Directives 3(b) to 3(d) of the BCUC 2018 Order because BC Hydro manages its system on a portfolio basis and is therefore not able to generate the information requested. Finally, BC Hydro confirms it will continue filing monthly reports to monitor water levels and inflows at each of the Kinbasket and Williston reservoirs pursuant to Directive No. 4 of the BCUC 2018 Order;

H. BC Hydro submited that no further evidentiary process in regard to the 2019 Letter Agreement is warranted. Instead, and as noted on page 11 of the August 2, 2019 Application, BC Hydro proposes that the Commission invite submissions from interveners on the narrow question whether the 2019 Letter Agreement can be declared to be in the public interest and accepted for filing or, alternatively, whether some material doubt arises in regard to the proposed relief such that a full hearing is necessary. Assuming the Commission invites submissions from interveners on this question, then BC Hydro expects it would have a right of reply.

NOW THEREFORE pursuant to section 71 of the *Utilities Commission Act* , the Commission orders as follows:

1. On the basis in part of the Delivery Term Commitment, the 2019 Letter Agreement between BC Hydro and Powerex is accepted for filing.

2. BC Hydro is directed to file the following with the BCUC, 90 days after the end of each calendar quarter, a public report that specifies the Transactions (as defined in the 2019 Letter Agreement) that occurred during the relevant calendar quarter.

DATED at the City of Vancouver, in the Province of British Columbia, this (XX) day of (Month Year).

BY ORDER

(X. X. last name)
Commissioner

Attachment Options

DRAFT

1.0 A. MARKET DYNAMICS

Reference: COST OF ENERGY
British Columbia Hydro and Power Authority (BC Hydro) Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases, as amended (2018 Letter Agreement Application), dated May 23, 2019,[1] p. 3; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 3.2 Market electricity purchases

BC Hydro's response to BCUC IR 3.2 regarding the 2018 Letter Agreement Application included the below table along with accompanying notes:

High shortfall scenario: All quantities in GWh

Date	Domestic Load	BC Hydro Generation	Other Domestic Generation	Forward Electricity Purchases	Domestic Electricity Purchases	Domestic Electricity Sales	Trade Electricity Purchases	Trade Electricity Sales
Dec-18	[redacted]		1155	0	220	0	354	-185
Jan-19			984	164	25	0	355	-319
Feb-19			755	254	0	0	183	-267
Mar-19			873	496	0	0	756	-5
Apr-19			1015	356	0	0	913	0
May-19	[redacted]							
Jun-19								

Notes on data in Tables:
1. **Sign convention shows purchases as positive values, sales as negative values.**
2. **Domestic Load does not exactly equal the sum of the resources in the other columns due to losses and rounding.**
3. **At the time of writing, actual data on loads and resources were available for December 2018 and January 2019, with forecast data for February 2019 onwards from the February Energy Study. December 2018 and January 2019 data are preliminary only.**
4. **Other Domestic Generation includes energy from independent power producers as well as ICG.**
5. **Market Electricity Purchases and Sales represent consolidated (both domestic and trade) activity. The February Energy Study included 1269 GWh of ESA purchases made as of the study forecast date, with the balance assumed to be from the spot market. By the end of February 1159 GWh of ESA purchases were added, which would replace the modeled spot market purchases.**
6. **The high (2008) and low (2016) scenarios provided are the extremes of the 46 weather sequences modeled in the Energy Studies, as can be seen in the graphs provided in response to BCUC IR 1.3.2.1.**

BC Hydro's 2018 Letter Agreement Application states:

> BC Hydro's current system storage (combined Williston and Kinbasket reservoirs) is at a record low for this time of year. BC Hydro's October energy studies indicate a potential 1,700 GWh energy deficit for the period ending March 31, 2019 and an additional 1,000 GWh energy deficit for April 2019 due to low inflows into BC Hydro's reservoirs in September and October and an increase in BC Hydro's load forecast.

[1]. https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/fep/00-2019-05-23-bchydro-bcuc-wm.pdf

1.1.1 Please explain how purchases to satisfy domestic load, and trade electricity purchases and sales can occur in the same month.

RESPONSE:

Under the 2003 Transfer Price Agreement (TPA), BC Hydro purchases and sells electricity with Powerex at a Transfer Price (as defined in the TBA), which is based on the applicable day-ahead Mid-C index price. The day-ahead Mid-C index has both a Heavy Load Hour (HLH) index (based on transactions for hours ending 7 to 22 Monday to Saturday, excluding holidays) and a Light Load Hour (LLH) index (all other hours). BC Hydro can establish a "Threshold Purchase Price", which is a price below which it is willing to purchase electricity from Powerex for domestic purposes. It can also set a Threshold Sale Price, which is a price above which it is willing to sell electricity to Powerex for domestic purposes. The allocation of energy between domestic and trade happens hourly.

The following example illustrates how under the 2003 TPA in any given month, it is expected that there can be purchases accounted for as being for domestic purposes and purchases and sales accounted for as being for trade purposes. Since the question relates to purchases to satisfy domestic load, this example is based on a situation where it is assumed that BC Hydro has established a Threshold Purchase Price. Consequently, during any hours where:

- **The Transfer Price is less than the Threshold Purchase Price and there is a net transfer of energy <u>to BC Hydro</u>, then the purchases in that hour are accounted for as being for domestic purposes;**
- **The Transfer Price is greater than the Threshold Purchase Price and there is a net transfer of energy <u>to BC Hydro</u>, then the purchases in the hour are accounted for as being for trade purposes (ie., are allocated to the "trade account"); and**
- **The net transfer of energy is <u>from BC Hydro</u>, then the sales in the hour are accounted for as being for trade purposes (ie., are debited from the "trade account").**

Neither the 2018 Letter Agreement nor the 2019 Letter Agreement were intended to interfere with these essential aspects of the 2003 TPA. Instead, the 2018 Letter Agreement and the 2019 Letter Agreement were designed to ensure that BC Hydro and Powerex could continue to respond day-to-day to evolving system and market conditions for the benefit of BC Hydro's ratepayers. In consequence, it is expected that there will be months during the term of both letter agreements that BC Hydro purchases forward physical electricity from Powerex for domestic purposes while at the same time purchases and/or sales also occur for trade purposes under the 2003 TPA.

Note that under all three agreements BC Hydro maintains full control and decision-making authority for its generation assets, and manages its domestic obligations in light of the physical capability of its system regardless of accounting allocations.

1.0 A. MARKET DYNAMICS

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BC Hydro's response to BCUC IR 3.2 regarding the 2018 Letter Agreement Application included the below table along with accompanying notes:

High shortfall scenario: All quantities in GWh

Date	Domestic Load	BC Hydro Generation	Other Domestic Generation	Forward Electricity Purchases	Domestic Electricity Purchases	Domestic Electricity Sales	Trade Electricity Purchases	Trade Electricity Sales
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1 https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/fep/00-2019-05-23-bchydro-bcuc-wm.pdf.

1.1.2 Please explain whether purchases made under the BC Hydro 2019 Letter Agreement to satisfy domestic load, and trade electricity purchases and sales, could occur during the same delivery period.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.1.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
Exhibit B-1, Application, pp. 4–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 11.2.1
Day-ahead market

On pages 4 to 5 of BC Hydro's Application for 2019 Letter Agreement with Powerex Corp. (Application), it states:

> BC Hydro's intention in entering into the 2019 Letter Agreement was to proactively ensure appropriate measures are in place to respond to future physical supply issues. The structural changes in the market, particularly the declining liquidity in the Mid-Columbia day-ahead market…continue to exist, therefore the ability to acquire wholesale electricity from Powerex on a forward basis remains a valuable tool for BC Hydro to have available to address short-term operational requirements. Forward purchases under the 2018 Letter Agreement helped provide BC Hydro with additional supply to allow it to meet its load-serving obligations during the 2018/2019 winter season.
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> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.
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> In summary, the impending physical supply issue in 2018/2019 was largely caused by low system inflows and the Enbridge pipeline explosion in October 2018.The 2018 Letter Agreement was a response to those conditions and also accounted for the declining liquidity in Pacific Northwest wholesale day-ahead markets by providing for more certainty of supply through the forward physical purchases.

On pages 5 to 6 of the Application, BC Hydro provides the following charts:

10. Market Liquidity

Figure 10.1:Mid-C Liquidity (Day-Ahead Peak)

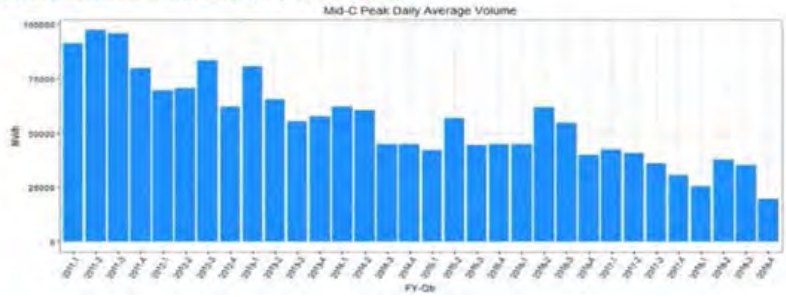
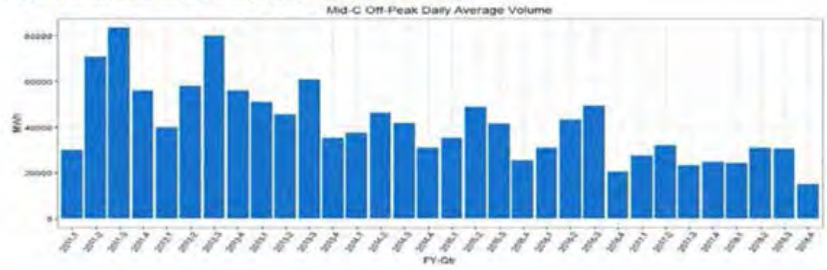


Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)



1.2.1 Please confirm or explain otherwise, that the Pacific Northwest wholesale day-ahead markets referred to in the preamble refers only to the Mid-C market.

RESPONSE:

Not confirmed. The Mid-C market is the trading hub for transactions within the Pacific Northwest and the referenced graphs show liquidity at Mid-C. The Application reference to "Pacific Northwest wholesale day-ahead markets" reflects that fact that there are trades that can occur in the Pacific Northwest that are not included in the Mid-C volumes shown in Figures 10.1 and 10.2. However, the Mid-C volumes are the dominant volumes and the trend in Mid-C are generally reflective of the trend overall in the Pacific Northwest.

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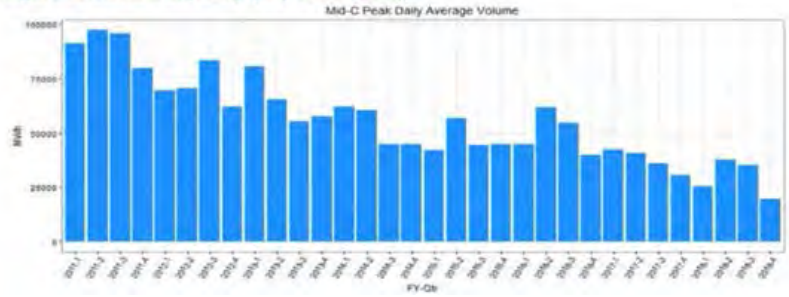

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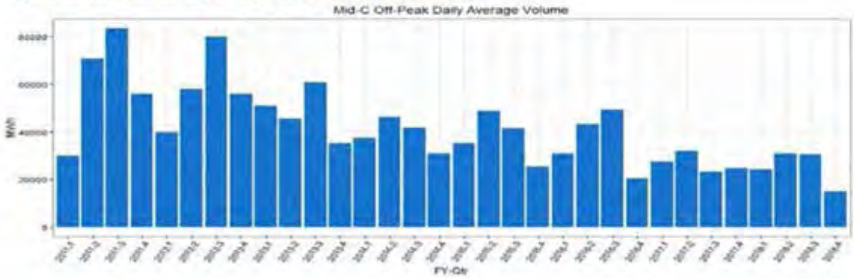

1.2.1 Please confirm or explain otherwise, that the Pacific Northwest wholesale day-ahead markets referred to in the preamble refers only to the Mid-C market.

1.2.1.1 Does BC Hydro transact on any other day-ahead market? Please discuss.

RESPONSE:

BC Hydro does not transact in any day ahead market including Mid-C. BC Hydro transacts wholesale market power with Powerex pursuant to either the 2003 TPA or the 2019 Letter Agreement and has done so under 2018 Letter Agreement.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
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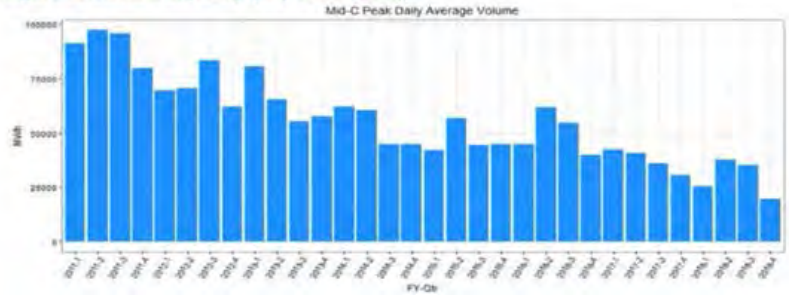

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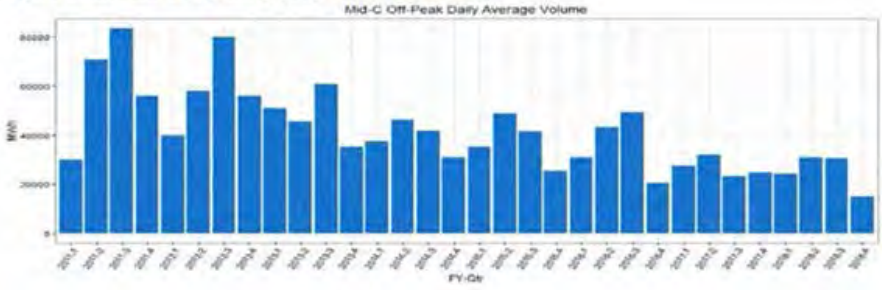

1.2.1 Please confirm or explain otherwise, that the Pacific Northwest wholesale day-ahead markets referred to in the preamble refers only to the Mid-C market.

1.2.1.2 What alternative markets, if any, can BC Hydro use for short-term purchases?

RESPONSE:

BC Hydro does not purchase electricity from any market. Please refer to BC Hydro's response to BCUC IR 1.2.1.1 regarding how BC Hydro purchases energy from Powerex.

2.0 A. MARKET DYNAMICS

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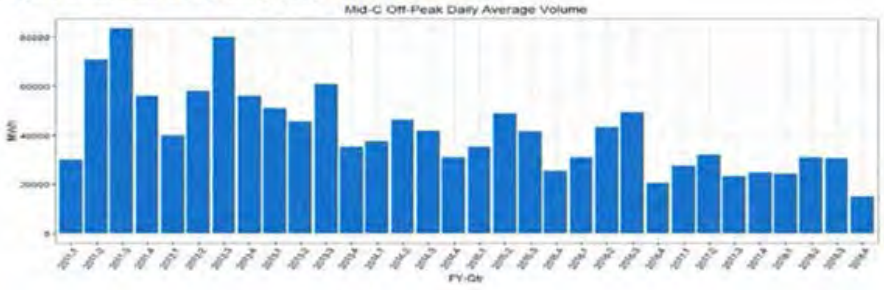

1.2.2 Please confirm, or explain otherwise, that BC Hydro will continue to transact on the day-ahead markets through the 2003 Transfer Pricing Agreement (TPA).

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.1.1 regarding how BC Hydro purchases energy from Powerex. Please refer to BC Hydro's response to BCUC IR 1.1.1 for an explanation of how BC Hydro can continue to transact with Powerex under the 2003 TPA concurrently with the 2019 Letter Agreement.

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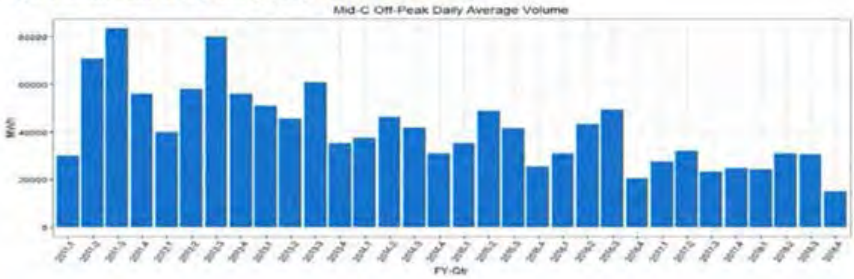

1.2.3 Please discuss the factors behind the declining liquidity on the day-ahead markets.

RESPONSE:

BC Hydro does not have detailed information on the specific factors that are contributing to the decline in the liquidity in the day-ahead markets. BC Hydro has observed from Figures 10.1 and 10.2 that the volumes traded in the day-ahead market are declining and uncertain. BC Hydro understands that the volume traded is reflective of a multitude of individual decisions by many market participants. However, some of the contributing factors may be:

1. **Some load serving entities are increasingly seeking the security of forward supply commitments to meet their expected peak loads and to manage operations. This can include forward procurement to meet formal resource adequacy requirements; and**

2. **Some load serving entities are increasingly seeking forward supply commitments for energy products with specific environmental attributes in part to comply with clean energy policies. This includes purchase of electricity from wind and solar generation facilities.**

To the extent entities meet their procurement needs in the forward energy markets it can be reasonably expected to reduce their participation in the day-ahead markets.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
Exhibit B-1, Application, pp. 4–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 11.2.1
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On pages 5 to 6 of the Application, BC Hydro provides the following charts:

10. Market Liquidity

Figure 10.1:Mid-C Liquidity (Day-Ahead Peak)

Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

1.2.4 Please discuss the effects the declining liquidity on the day-ahead markets had on the day-ahead price and volatility over the past 10 years.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.7.2.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
Exhibit B-1, Application, pp. 4–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 11.2.1
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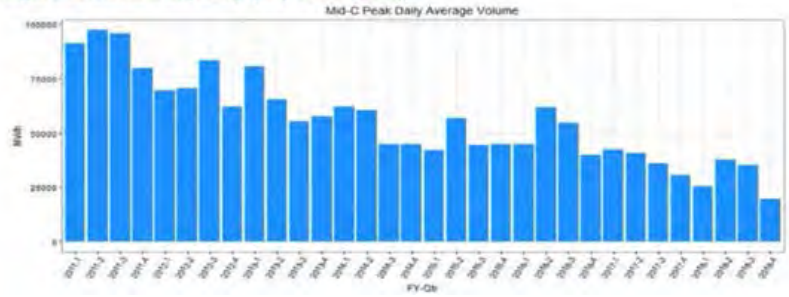
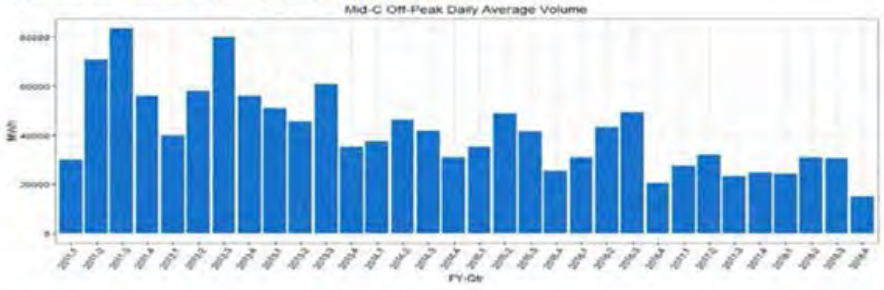


Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)



1.2.4 Please discuss the effects the declining liquidity on the day-ahead markets had on the day-ahead price and volatility over the past 10 years.

1.2.4.1 Please explain how ratepayers are affected by the reduced liquidity in the day-ahead markets.

RESPONSE:

It is impossible to calculate with any reasonable degree of certainty the effect of reduced liquidity in the day-ahead markets on ratepayers. However, to the extent BC Hydro is limited in its import and export activity to transactions that rely on the day-ahead market, reduced liquidity in that market can result in less volume being sold or purchased than desired on any given day (at the prevailing day-ahead transfer price with Powerex under the 2003 TPA). This can result in challenges in having to meet domestic deficits as well as increased costs associated with having to spread out domestic purchases over a greater number of days, including higher priced days, to achieve the desired purchase volume.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
Exhibit B-1, Application, pp. 4–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 11.2.1
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Figure 10.1:Mid-C Liquidity (Day-Ahead Peak)

Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

1.2.5 Please explain why BC Hydro filed the 2018 Letter Agreement in December 2018 when declining liquidity on the day-ahead market has been observed over the past 10 years.

RESPONSE:

In November 2018, BC Hydro forecasted a shortfall in available energy (driven by lack of precipitation, low reservoir levels and constraints on the Enbridge pipeline system) to meet domestic requirements prior to the commencement of the freshet in 2019. BC Hydro was concerned that if the winter turned out to be cold and dry, the volumes required may not be available from the spot market due to the observed decline in liquidity.

Since 2012, BC Hydro has generally had a surplus of energy. While the declining liquidity can also pose challenges with regard to the disposal of surplus, it does not create the same acute risks as the 2018/2019 shortfall.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
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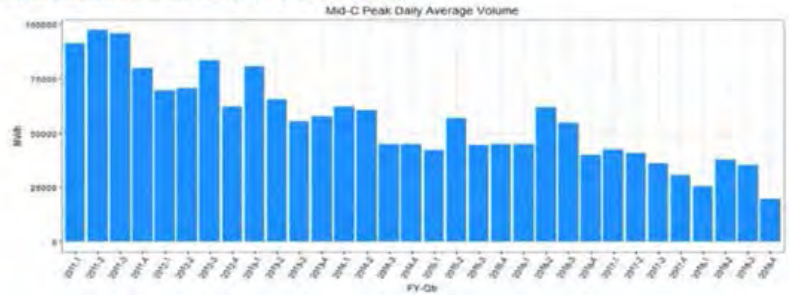


Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

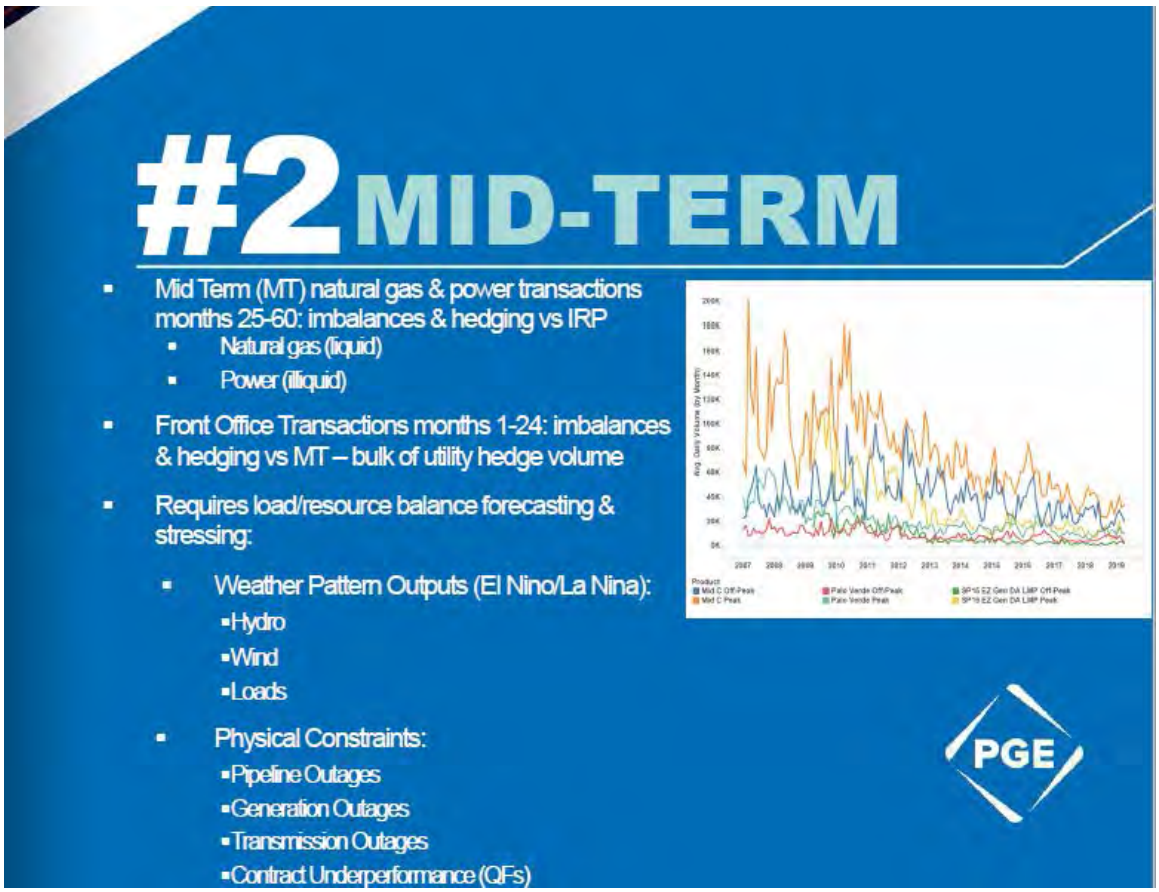
1.2.6 Have other participants in the day-ahead market raised any concerns with BC Hydro as a result of the declining liquidity in Pacific Northwest wholesale day-ahead subsequent to the 2018 Letter Agreement? Please discuss, providing examples of such correspondence where possible.

RESPONSE:

No other participants in the day-ahead market have directly raised concerns with BC Hydro regarding declining day-ahead market liquidity. However, BC Hydro notes that a representative of Portland General Electric addressed the issue at the spring 2019 Joint CREPC-WIRAB Meeting in a session discussing Portland General's Integrated Resource Planning approach. The session was entitled "Utility Forward Purchasing in the Bilateral Wholesale Market" and the slide addressing liquidity is slide 9.

The agenda for the meeting can be found at the following link: https://westernenergyboard.org/wp-content/uploads/2019/04/Spring-2019-Joint-CREPC-WIRAB-Agenda-April-19-version.pdf

The following image below is of slide 9 from the presentation which can be found at the following link: https://westernenergyboard.org/wp-content/uploads/2019/04/04-18-19-crepc-wirab-mumm-albi-pge-utility-forward-purchasing.pdf.



2.0 A. MARKET DYNAMICS

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10. Market Liquidity

Figure 10.1:Mid-C Liquidity (Day-Ahead Peak)

Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

1.2.7 How will the 2019 Letter Agreement affect liquidity in the Pacific Northwest wholesale day-ahead markets? Please discuss.

RESPONSE:

As noted in BC Hydro's response to BCUC IR 1.2.3, BC Hydro does not know the specific reasons for the observed decline in liquidity, but does note that it is the result of independent decisions of many market participants. The only statement that BC Hydro can make is that, to the extent any entity meets its procurement needs in the forward markets, the volumes associated with that need would therefore not be transacted in the day-ahead market.

Please also refer to BC Hydro's response to BCUC IR 1.2.7.2.

2.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT
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1.2.7 How will the 2019 Letter Agreement affect liquidity in the Pacific Northwest wholesale day-ahead markets? Please discuss.

1.2.7.1 Will the effects of the 2019 Letter Agreement on the day-ahead liquidity be the same as those observed after BC Hydro entered into the 2018 Letter Agreement? Please explain.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.7.2.

2.0 A. MARKET DYNAMICS

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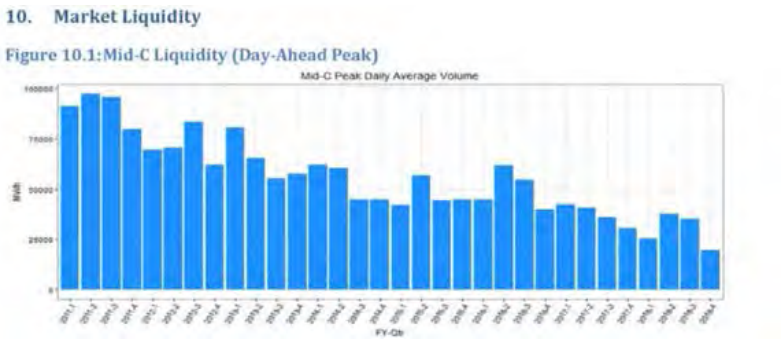

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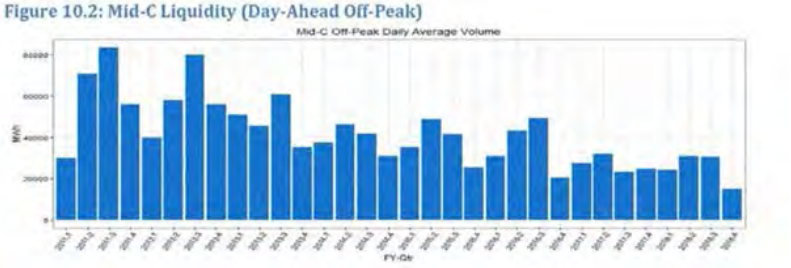

1.2.7 How will the 2019 Letter Agreement affect liquidity in the Pacific Northwest wholesale day-ahead markets? Please discuss.

1.2.7.2 Please discuss the impact, if any, the 2019 Letter Agreement could have on the prices observed and the volumes transacted on the day-ahead markets.

RESPONSE:

There is no definitive answer to how a decrease in volume of wholesale electricity traded on a day-ahead basis would affect:

- **Prices in the day-ahead market;**
- **Hourly and sub-hourly wholesale prices and trade volumes;**
- **Price volatility; and**
- **Long-term forward wholesale prices and trade volumes.**

Liquidity affects the quantity that can be acquired at a prevailing market price as opposed to determining the prices themselves. Prices in the various markets are determined by the broad supply demand balance on a regional and inter-regional basis, which are constantly changing and include the transactions of many buyers and many sellers. In this regard, Powerex is just one of many participants in the day-ahead market.

2.0 A. MARKET DYNAMICS

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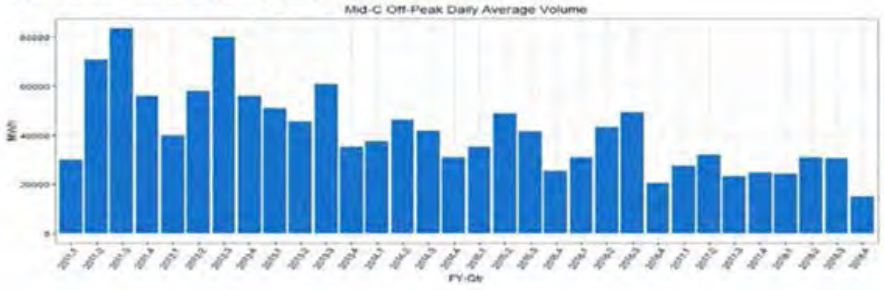

1.2.8 Please explain how the 2019 Letter Agreement affects BC Hydro's ability to transact on the day-ahead markets.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.1.1 where BC Hydro clarifies that it does not transact in day-ahead markets.

Please refer to BC Hydro's response to BCUC IR 1.1.1 for further comment on how the 2019 Letter Agreement works with the 2003 TPA.

2.0 A. MARKET DYNAMICS

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Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

1.2.9 Could the 2019 Letter Agreement impact the viability of the day-ahead market? Please discuss.

RESPONSE:

No. Please refer to BC Hydro's response to BCUC IR 1.2.7.2.

Moreover, even if all entities procured their expected needs on a forward basis, the day-ahead market would be expected to continue to exist in order to provide daily opportunities to make purchases and sales to respond to changing system, grid and market conditions.

2.0 A. MARKET DYNAMICS

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Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

1.2.10 Please discuss the extent to which a decrease in the volume of wholesale electricity traded on a day-ahead basis affects long-term forward wholesale prices and trade volumes.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.7.2.

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1.2.11 Please discuss the extent to which a decrease in the volume of wholesale electricity traded on a day-ahead basis affects hourly and sub-hourly wholesale prices and trade volumes.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.7.2.

2.0 A. MARKET DYNAMICS

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> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.
>
> In summary, the impending physical supply issue in 2018/2019 was largely caused by low system inflows and the Enbridge pipeline explosion in October 2018.The 2018 Letter Agreement was a response to those conditions and also accounted for the declining liquidity in Pacific Northwest wholesale day-ahead markets by providing for more certainty of supply through the forward physical purchases.

On pages 5 to 6 of the Application, BC Hydro provides the following charts:

10. Market Liquidity

Figure 10.1:Mid-C Liquidity (Day-Ahead Peak)

Figure 10.2: Mid-C Liquidity (Day-Ahead Off-Peak)

1.2.12 Please discuss how a decline on wholesale volumes traded on a day-ahead basis in the Pacific Northwest affects the day-ahead price. As part of your response, please comment on the effect of a decline in wholesale trading volumes on the supply and demand of wholesale electricity at Mid-C.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.7.2 with respect to the day-ahead price.

Please refer to BC Hydro's response to BCUC IRs 1.2.1 and 1.2.3 with respect to the day-ahead volumes.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 9.4
Supply risks

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement was entered into proactively to ensure appropriate measures are in place should similar supply issues arise from time to time and generally to allow BC Hydro to manage the type of risks that led to the 2018 Letter Agreement in a timely way."

BC Hydro further states on page 6:

> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

In response to BCUC IR 9.4, BC Hydro stated:

> The need for forward purchases continues even though the T-South capacity has increased. BC Hydro's forward purchases are being made to meet expected domestic needs, considering the risk associated with spot market supply availability from Powerex for the Winter 2018/19 season. Although there have been some improvements in the T-South capacity, BC Hydro understands that western spot market supply availability to Powerex remains relatively limited given (1) low natural gas storage levels for this time of year in the west; (2) de-rates to T-South capacity down to approximately 70 per cent for the month of March, associated with scheduled inspections that are planned to continue through the summer of 2019; (3) higher demand in the Pacific Northwest associated with colder weather, particularly in February; (4) lower hydro conditions in the US Pacific Northwest; and (5) a continued trend of reduced spot market liquidity over the past decade.

1.3.1 Please discuss whether constraints on the Enbridge T-South pipeline will continue to have long-term effects on western spot market supply availability.

RESPONSE:

If the Enbridge T South pipeline continues to be constrained in its operations on a go forward basis, then that could have an impact on the long-term market by virtue of generally less natural gas being deliverable within the region, all other things being equal.

Enbridge has announced that the Enbridge T South pipeline will be restored to 90 to 95 per cent capacity by November 1, 2019, and full capacity by mid to late November 2019. Please see Enbridge's September 11, 2019 notice, here: https://noms.wei-pipeline.com/notices/ci_notice.show?id=52563.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 9.4
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> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

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1.3.2 What supply risks does BC Hydro forecast over the short to medium term? As part of your response, please explain how the 2019 Letter Agreement mitigates those risks.

RESPONSE:

As described further in BC Hydro's response to BCUC IR 1.5.1, the operational time frame that the 2019 Letter Agreement covers is zero to three years. Furthermore, the 2019 Letter Agreement is an energy supply contract designed to manage seasonal or longer-term energy deficits, within that operational time frame.

The 2019 Letter Agreement is not designed to manage energy or capacity deficits that are intra-month in nature. For example, it does not allow for within-month Purchase Interest Requests.

As a result, this response focuses on the energy supply risks and variability that BC Hydro manages in the one month to three year operational timeframe (i.e., the "short to medium" time frame referred to in the IR) that are addressed by the 2019 Letter Agreement.

The largest driver of uncertainty in BC Hydro's Cost of Energy forecast is water inflows. In any given year, BC Hydro may have an operating surplus or an operating deficit, even when under average inflow conditions BC Hydro has an operating surplus of approximately 4000 GWh. (please refer to BC Hydro's response to Fiscal 2020 to Fiscal 2021 Revenue Requirements Application (F20-F21 RRA) IRs BCUC IR 1.15.3 and CEABC IR 2.28.1 for a description of planning and operational surplus which are attached). When BC Hydro has an operational deficit, load requirements can be met by a combination of additional generation from a net withdrawal from system storage, by importing electricity, or by dispatching thermal generation. Likewise, when BC Hydro has an operational surplus, BC Hydro can export energy or store the energy into system storage.

There are two time periods that present different risks associated with managing system storage within the operational time frame:

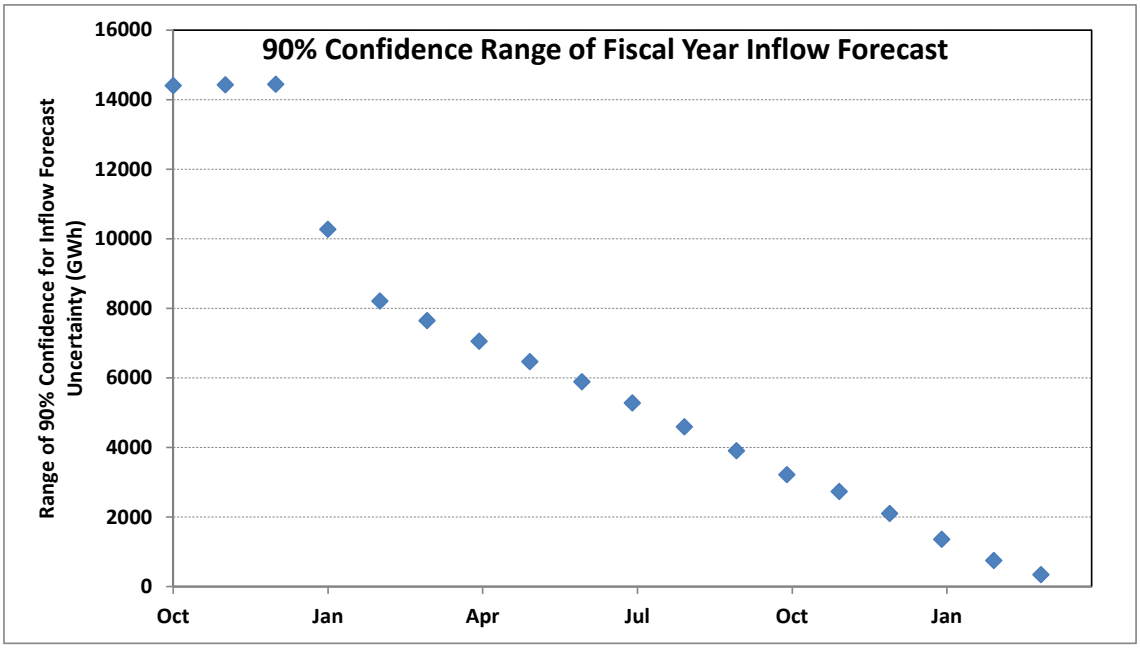
1) April to early May: when the annual minimum elevation of system storage is typically reached. The risk is not being able to meet its operational needs in a cold and dry spring if the system storage is drafted too deep too soon without compromising minimum reservoir constraints; and

2) Late June through September: when the annual maximum elevation of system storage is typically reached. The risk is having to spill if the reservoirs fill and additional inflow cannot be stored.

The 2019 Letter Agreement mitigates the first risk by allowing BC Hydro to secure forward electricity purchases in years when it faces a deficit and the risk of deep drafts of system reservoirs is high. As such, the Delivery Term for the most part is expected to be less than a year. The 2019 Letter Agreement does not mitigate the second risk of system spill.

In any given fiscal year, the variability in the energy supply from inflows that BC Hydro can experience is represented in the figure below (applying a normal distribution to the data). In nine years out of 10, that variability is expected to be in the range of about +/- 7000 GWh, which is about +/- 12 per cent of BC Hydro's annual energy load.

The figure below demonstrates how that forecast variability decreases as the year progresses.



Note, that the variability shown in the figure is what is modeled in the Energy Studies and does not capture the full range of inflow risk that BC Hydro manages due primarily to variability in hydro-based Electricity Purchase Agreement deliveries. As is seen in the figure, the variability is about 14,000 GWh (i.e., +/- 7000 GWh) in the studies in the fall prior to the start of the fiscal year when there is no information about inflow conditions in that fiscal year. The range drops rapidly across the January to March period as observed snowpack information is included. Thereafter, it decreases evenly as observed precipitation in the prior month reduces the overall uncertainty for the fiscal year total.

Further, BC Hydro's response to BCUC IR 1.9.4 from the 2018 Letter Agreement, attached to this response, BC Hydro listed a number of reasons why the western spot market supply was limited in 2018:

1) De-rates to T-South capacity;

2) Low natural gas storage levels;

3) Higher demand in the Pacific Northwest associated with colder weather;

4) Lower hydro conditions in the US Pacific Northwest; and

5) Continued trend or reduced spot market liquidity over the past decade.

Regarding the T-South capacity, Enbridge has announced that the Enbridge T South pipeline will be restored to 90-95 per cent capacity by November 1, 2019, and full capacity by mid to late November 2019. Please see Enbridge's September 11, 2019 notice, here:
https://noms.wei-pipeline.com/notices/ci_notice.show?id=52563

Regarding winter levels for natural gas storage, demand and hydro in Pacific Northwest, these conditions will evolve across the winter. For Market liquidity, please refer to BC Hydro's response to BCUC IR 1.2.3.

Notwithstanding the above, in any given year BC Hydro may experience other supply risks such as forced outages, variability in Electricity Purchase Agreement deliveries, or changes to load. The 2019 Letter Agreement is a tool to respond to any such risks in the operational timeframe.

British Columbia Utilities Commission Information Request No. **1.15.3** Dated: **April 23, 2019** British Columbia Hydro & Power Authority Response issued **June 6, 2019**	Page 1 of 3
British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-5**

15.0 D. CHAPTER 4 – COST OF ENERGY

Reference: COST OF ENERGY
Exhibit B-1, Section 4.7, pp. 4-28, 4-32–4-33, Figure 4-2; Appendix C, p. 22;
Zapped: A Review of BC Hydro's Purchase of Power from Independent Power Producers conducted for the Minister of Energy, Mines and Petroleum Resources, dated February 2019[1], p. 2;
BC Hydro F2017-F2019 RRA proceeding, Exhibit B-1-1, Tables 3-6–3-9
IPP renewal assumption

In Exhibit B-1-1 of the BC Hydro F2017-F2019 RRA proceeding, BC Hydro provides the load resource balance in terms of energy and capacity, with existing and committed resources and with planned resources, respectively, in Tables 3-6 through 3-9.

BC Hydro states on page 4-28 of the Application that "BC Hydro has been pursuing the renewal of expiring EPAs to meet future long-term energy needs and has renewed contracts with IPPs at lower prices than under their original contracts."

BC Hydro states on page 4-33 of the Application:

> **EPA Renewals:** This represents the net change in cost (i.e., certain new EPAs to replace existing expiring EPAs are forecast to increase in cost and others are forecast to decrease) from the fiscal 2019 RRA to the fiscal 2021 Plan of those EPAs that have been renewed since the Previous Application and those EPAs that are assumed to be renewed during the test period. This net increase includes the costs of expiring EPAs, the costs for hydro renewals and the costs associated with the Biomass Energy Program.

Figure 4-2 of the Application shows a breakdown of total IPP purchase cost forecast increases from F2019 to F2021, where IPP renewals accounts for $1.3 million increase to the cost of energy from F2019 to F2021.

In the February 2019 report titled Zapped by Ken Davidson, it states on page 2 that "there is an opportunity to address these financial issues when the EPAs for IPP projects expire and can be renewed on a commercial and market rate basis."

The Phase 1 Final Report filed as Appendix C to the Application states that "[t]he cost of energy procured from Independent Power Producers is now one of BC Hydro's biggest cost drivers and these costs will be recovered from

[1] https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/electricity/bc-hydro-review/bch19-158-ipp_report_february_11_2019.pdf.

ratepayers. Though BC Hydro has not conducted competitive calls for power since 2011, it is projected to have an energy surplus into the 2030s."

1.15.3 Please provide an updated load resource balance as provided in the F2017-F2019 RRA proceeding (Tables 3-6 through 3-9). If an updated load resource balance is not available, please explain why not.

RESPONSE:

This answer also responds to CEABC IR 1.4.1.

Tables 3-6 and 3-8 of the Previous Application show long-term energy load resource balances (LRBs) which were indicative of a long term operational view. As an update to these Tables, BC Hydro provides the following:

- **Table 1 below which provides the surplus/deficit of an energy LRB from an operational view based on BC Hydro's Energy Studies. Table 1 is an update of Table 3-8 of the Previous Application which shows the LRB after planned resources. Energy Studies are the operational studies that underpin the financial analysis in the Application. In the operational view, surplus is defined as the amount by which system inflows plus deliveries from EPA contracts exceeds load, and deficit is defined as a negative surplus.**

  The Energy Studies model operations for the next five years (i.e., to the end of fiscal 2024 in the current studies). These results are used for operational decision making (e.g., setting the threshold sale price) and for near-term financial forecasts (e.g., the Cost of Energy forecast in the Application). However, operational forecasts are not used to determine the need for new resources.

- **Attachment 1 to this response provide the surplus/deficit of a capacity and an energy LRB from a planning view. Attachment 1 to this response is BC Hydro's response to BCUC IR 1.11.2.2.1 from the Electricity Purchase Agreement Renewals for Sechelt Creek Hydro, Brown Lake Hydro and Walden North Hydro proceeding.**

  The planning LRB is the view used to determine the need for new resources and reflects the capability of resources based on BC Hydro's planning criteria. It incorporates supply information that is consistent with the Energy Studies but it includes adjustments to the May 2016 20-year load forecast as described in the attachment.

  Table 2 below provides the first five years of Table 3 in Attachment 1 using the October 2018 Load Forecast instead of the adjusted May 2016 20-year load forecast.

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British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-5**

In summary, the planning view reflects the capability of resources based on BC Hydro's planning criteria while the operational view shows the forecasted operation of these same resources given market and system conditions.

BC Hydro is currently developing a new 20-year load forecast and the associated planning LRB which we will file in this proceeding once available.

Table 1 Operational View of Energy Surplus/Deficit based on October 2018 Energy Study

GWh	F2020	F2021	F2022	F2023	F2024
Surplus/Deficit	2,985	3,834	4,318	4,119	3,029

Table 2 Planning Vie of Energy Surplus/Deficit based on October 2018 Short Term Load Forecast

	GWh	F2020	F2021	F2022	F2023	F2024
Line 14	**Surplus / (Deficit)**	5,677	6,293	6,517	6,191	5,348
Line 15	**Surplus / Deficit as % of Net Load**	110%	111%	111%	111%	109%
Line 16	**Small Gap Surplus / (Deficit)**	7,009	8,183	8,753	8,938	8,646
Line 17	**Large Gap Surplus / (Deficit)**	4,096	3,996	3,763	2,807	1,320

Clean Energy Association of B.C. Information Request No. **2.28.1** Dated: **August 1, 2019** British Columbia Hydro & Power Authority Response issued **September 3, 2019**	Page 1 of 3
British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-13**

28.0 Reference: Exhibit B-6, BC Hydro response to CEABC IR 1.5.1, Surplus Sales

While the CEABC appreciates BC Hydro's response to CEABC IR 1.5.1, and the cross reference to BCUC IR 1.15.3, the CEABC seeks further clarification of the surpluses and deficits related to BC Hydro's planning and operational views.

In its response to BCUC IR 1.15.3, BC Hydro describes the distinction between the planning and the operational views as follows:

"In summary, the planning view reflects the capability of resources based on BC Hydro's planning criteria while the operational view shows the forecasted operation of these same resources given market and system conditions."

BC Hydro then presents the following two tables illustrating the different Surplus/Deficit projections resulting from these two views over the period F2020 to F2024:

Table 1 Operational View of Energy Surplus/Deficit based on October 2018 Energy Study

GWh	F2020	F2021	F2022	F2023	F2024
Surplus/Deficit	2,985	3,834	4,318	4,119	3,029

Table 2 Planning Vie of Energy Surplus/Deficit based on October 2018 Short Term Load Forecast

	GWh	F2020	F2021	F2022	F2023	F2024
Line 14	Surplus / (Deficit)	5,677	6,293	6,517	6,191	5,348

According to these tables, the operational view projects a surplus which is 2,000 to 3,000 GWh less than that projected by the planning view.

2.28.1 Please describe all the differences between the assumptions used under "BC Hydro's planning criteria" and those that reflect "market and system conditions". In particular, how do these two separate sets of assumptions differ with regard to the following:

- The assumed output of the Heritage hydro assets (e.g. under average water conditions vs. the critical water period);
- The assumed purchases from Alcan (i.e. deliveries from Kemano under average vs critical water conditions);
- The assumed purchases from Island Generation;
- The assumed purchases from IPPs and from EPA Renewals (e.g. under average vs. critical water conditions);

- The assumed savings from DSM programs
- The assumed savings from price elasticity or natural conservation
- Any other significantly different assumptions between planning and operational criteria?

RESPONSE:

The Planning View reflects the capability of resources based on BC Hydro's planning criteria. The Operational View shows the forecast operation of these same resources given market and system conditions. The table below provides a description of the assumptions used under BC Hydro's Planning View and BC Hydro's Operational View.

The largest difference between the Planning View and the Operational View is the generation from Island Generation. The Planning View includes the amount of generation that Island Generation is capable of producing in a year (2,170 GWh), whereas the Operational View uses the generation forecast for Island Generation from the Energy Studies which reflects generation for both reliability and economics. In Table 1 of BC Hydro's response to BCUC IR 1.15.3, the forecast generation of Island Generation for the period fiscal 2020 to fiscal 2024 ranges from 0 to 26 GWh per year.

	Planning View	Operational View
Heritage Hydro	**Based on system modelling that maximizes energy.**	**Based on system modelling that maximizes revenue while meeting load requirements.**
Rio Tinto Alcan	**Assumes amount of energy that Rio Tinto Alcan can generate during BC Hydro's critical water period.**	**Assumes the forecast that is provided by Rio Tinto Alcan based on current conditions.**
Island Generation	**Assumes generating capability based on a 90 per cent availability factor (2,170 GWh).**	**Reflects expected usage based on the Energy Studies modelled dispatch.**

Clean Energy Association of B.C. Information Request No. **2.28.1** Dated: **August 1, 2019** British Columbia Hydro & Power Authority Response issued **September 3, 2019**	Page 3 of 3
British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-13**

	Planning View	Operational View
IPPs and EPA Renewals	**Run-of-river and storage hydro – assumes amount of energy that can be generated during BC Hydro's critical water period.** **For all other resources, assumes estimates provided by IPPs.** **EPA renewal percentage assumptions are the same as the Operating View.**	**For several of the run-of-river and storage hydro – forecast energy that can be generated based on current conditions. A few years in the future this converges on expected generation under average water.** **For all other IPP resources, assumes average energy based on historic actual deliveries or estimates provided by the IPPs adjusted as described in BC Hydro's response to BCUC IR 1.15.2.** **For information on our IPP forecast in the Operating View, including the EPA renewal assumptions, please refer to BC Hydro's response to BCUC IR 1.15.2.**
DSM Programs	**No difference between operational and planning views**	
Price Elasticity	**No difference between operational and planning views**	

British Columbia Utilities Commission **CONFIDENTIAL** Information Request No. **1.9.4** Dated: **February 8, 2019** British Columbia Hydro & Power Authority **PUBLIC** Response issued **May 23, 2019**	Page 1 of 2
British Columbia Hydro & Power Authority **Letter Agreement between BC Hydro and Powerex Corp.** **Forward Electricity Purchases**	

9.0 C. PRICE AND PRICE OF ALTERNATIVES

Reference: IMPACTS OF ENBRIDGE PIPELINE CONSTRAINTS

Application, pp. 4–5

Market Prices

Page 4 of the Application states:

On October 9, the 36 inch diameter pipe exploded north of Prince George. Emergency repairs are completed and the pipeline is in the process of returning to service. However, the National Energy Board has placed a restriction on pressure on both pipes, resulting in a de-rate from its normal operating capacity. Further, the deratings have been variable as the investigation into the pipeline's integrity has continued. Enbridge has not provided an estimate of when the pipelines may be returned to full service but the current forecast has restrictions across the winter.

Page 5 states:

From BC Hydro's perspective, we are assuming that Island Generation (275 MW) will be unavailable when planning for winter energy and peak loads. As a result, more utilities are looking to buy market energy and BC Hydro is seeing the availability of market supply declining as a result.

In addition to affecting supply, the Pipeline Explosion has resulted in increased energy prices. The Mid-Columbia (Mid-C) prices have increased substantially across the winter as show in Figure 2. For example, December prices have risen by about $50/MWh.

1.9.4 Please discuss whether the need for forward electricity purchases has changed, given the change in status of the pipeline as a result of Enbridge's announcement in December 2018 that T-South capacity was increasing.

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British Columbia Utilities Commission **CONFIDENTIAL** Information Request No. **1.9.4** Dated: **February 8, 2019** British Columbia Hydro & Power Authority **PUBLIC** Response issued **May 23, 2019**	Page 2 of 2
British Columbia Hydro & Power Authority **Letter Agreement between BC Hydro and Powerex Corp.** **Forward Electricity Purchases**	

RESPONSE:

The need for forward purchases continues even though the T-South capacity has increased.

BC Hydro's forward purchases are being made to meet expected domestic needs, considering the risk associated with spot market supply availability from Powerex for the Winter 2018/19 season.

Although there have been some improvements in the T-South capacity, BC Hydro understands that western spot market supply availability to Powerex remains relatively limited given (1) low natural gas storage levels for this time of year in the west; (2) de-rates to T-South capacity, down to approximately 70 per cent for the month of March, associated with scheduled inspections that are planned to continue through the summer of 2019; (3) higher demand in the Pacific Northwest associated with colder weather, particularly in February; (4) lower hydro conditions in the US Pacific Northwest; and (5) a continued trend of reduced spot market liquidity over the past decade as described in response to BCUC IR 1.8.1.1.

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BC Hydro further states on page 6:

> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

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1.3.3 Does BC Hydro anticipate similar supply issues observed in 2018 to reoccur in 2019 and/or the future? Please elaborate.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
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1.3.4 Please discuss which, if any, of the other reasons as stated in the preamble are still applicable under the 2019 Letter Agreement.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
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1.3.4 Please discuss which, if any, of the other reasons as stated in the preamble are still applicable under the 2019 Letter Agreement.

1.3.4.1 Is BC Hydro forecasting low system inflows this coming winter and in the foreseeable future? Please discuss.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.2 for a description of the risk of low system inflows in any given year and the tools BC Hydro uses to manage those risks.

Please refer to the F20-F21 RRA Evidentiary Update (Exhibit B-19) for an update of the Cost of Energy Forecast based on the June Energy Study. As stated in the F20-F21 RRA Evidentiary Update on page 8 "Dry conditions and lower water inflows have decreased planned hydroelectric generation (water rentals) and purchases from IPPs and Long-Term Commitments". Please also refer to BC Hydro's response to BCUC IR 3.314.3 in BC Hydro's F20-F21 RRA which is attached to this response.

British Columbia Utilities Commission Information Request No. **3.314.3** Dated: **September 19, 2019** British Columbia Hydro & Power Authority **REVISED PUBLIC** Response issued **October 18, 2019**	Page 1 of 2
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314.0 E. CHAPTER 4 – COST OF ENERGY

Reference: COST OF ENERGY
Exhibit B-11, pp. 7–8; California Independent System Operator (ISO), Western Energy Imbalance Market (EIM), Quarterly Gross Benefits;[1] BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases, as amended (Amended 2018 Letter Agreement), dated May 23, 2019,[2] p. 2; BC Hydro Application for 2019 Letter Agreement with Powerex Corp. (2019 Letter Agreement) proceeding, Exhibit B-1, p. 4
Market opportunities

On page 4 of the application to the BC Hydro 2019 Letter Agreement proceeding, it states:

> As noted above, and in contrast to the 2018 Letter Agreement, BC Hydro's intention in entering into the 2019 Letter Agreement was to proactively ensure appropriate measures are in place to respond to future physical supply issues.

BC Hydro states in the Evidentiary Update:

> The Cost of Energy forecast in the Application was based on BC Hydro's October 2018 energy study, The Cost of Energy forecast in the Evidentiary Update is based on the June 2019 energy study.
>
> Dry conditions and lower water inflows have decreased planned hydroelectric generation (water rentals) and purchases from IPPs and Long-Term Commitments.

3.314.3 Please explain whether water inflows per the June 2019 Energy Study are higher or lower relative to what was forecast in the energy study used to inform the Amended 2018 Letter Agreement. As part of the response, please discuss why forecast water inflows in the June 2019 Energy Study are higher or lower.

1 https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.

2 https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/fep/00-2019-05-23-bchydro-bcuc-wm.pdf.

British Columbia Utilities Commission Information Request No. **3.314.3** Dated: **September 19, 2019** British Columbia Hydro & Power Authority **REVISED PUBLIC** Response issued **October 18, 2019**	Page 2 of 2
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~~**CONFIDENTIAL SUBMISSION FOR BCUC ONLY**~~
UNREDACTED SUBMISSION ORIGINALLY FOR BCUC ONLY – NOW PUBLIC

RESPONSE:

~~**BC Hydro is filing part of this response in confidence with the BCUC, as the information remains confidential up to October 18, 2019, when the Cost of Energy Evidentiary Update will be publicly released.**~~

The Amended 2018 Letter Agreement was based on results from the November 2018 Energy Study. At that time, snowpack had yet to be built across winter 2018 to 2019, and fiscal 2020 forecast precipitation was not yet known. Therefore, average System Inflow from the November 2018 Energy Study was forecast to be 100 per cent of Normal. Fiscal 2020 System Inflow is forecast to be 87 per cent of Normal in the June 2019 Energy Study. This reduction is due to drier than average weather during the first part of fiscal 2019, and below average snowpack during winter 2018 to 2019, especially in the Williston basin.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 9.4
Supply risks

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement was entered into proactively to ensure appropriate measures are in place should similar supply issues arise from time to time and generally to allow BC Hydro to manage the type of risks that led to the 2018 Letter Agreement in a timely way."

BC Hydro further states on page 6:

> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

In response to BCUC IR 9.4, BC Hydro stated:

> The need for forward purchases continues even though the T-South capacity has increased. BC Hydro's forward purchases are being made to meet expected domestic needs, considering the risk associated with spot market supply availability from Powerex for the Winter 2018/19 season. Although there have been some improvements in the T-South capacity, BC Hydro understands that western spot market supply availability to Powerex remains relatively limited given (1) low natural gas storage levels for this time of year in the west; (2) de-rates to T-South capacity down to approximately 70 per cent for the month of March, associated with scheduled inspections that are planned to continue through the summer of 2019; (3) higher demand in the Pacific Northwest associated with colder weather, particularly in February; (4) lower hydro conditions in the US Pacific Northwest; and (5) a continued trend of reduced spot market liquidity over the past decade.

1.3.5 Please discuss the risks and benefits to ratepayers of transacting longer term wholesale power compared to transacting on the day-ahead market.

RESPONSE:

With respect to the 2019 Letter Agreement, and like the 2018 Letter Agreement, the primary benefit to ratepayers is related to supply risk management. The benefit of the forward purchases is providing certainty that the desired volume can be acquired. Please refer to BC Hydro's response to BCUC IRs 3.314.01 and 3.314.05 from the F20-21 RRA (provided as Attachment 1 to this response) for additional details on the benefits provided by acquiring electricity on the wholesale forward market.

Ahead of a given delivery period, no one knows whether the average applicable forward price(s) for a particular delivery period will end up above or below the average applicable day-ahead price for the same delivery period. In consequence there is a risk that BC Hydro purchases energy under the 2019 Letter Agreement at prices higher than would have been purchased at day-ahead prices under the 2003 TPA. Please refer to BC Hydro's response to CEC IR 1.1.1 for further discussion of price risks under the 2019 Letter Agreement.

BC Hydro considers that the risk of potentially procuring energy at higher prices is outweighed by the benefit of ensuring that BC Hydro can meet its operational needs as system or market conditions change.

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British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-16**

314.0 E. CHAPTER 4 – COST OF ENERGY

Reference: COST OF ENERGY
Exhibit B-11, pp. 7–8; California Independent System Operator (ISO), Western Energy Imbalance Market (EIM), Quarterly Gross Benefits;[1] BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases, as amended (Amended 2018 Letter Agreement), dated May 23, 2019,[2] p. 2; BC Hydro Application for 2019 Letter Agreement with Powerex Corp. (2019 Letter Agreement) proceeding, Exhibit B-1, p. 4
Market opportunities

BC Hydro states on page 2 of its Amended 2018 Letter Agreement:

> The financial implications of the Agreement and the changed operating conditions over the winter period are addressed in BC Hydro's F2020-F2021 Revenue Requirements Application. Although the purpose of the Agreement was to ensure reliable supply for BC Hydro's load at as reasonable a price as possible, there was a potential for BC Hydro to acquire the forward energy at prices that would be higher than the ultimate market prices. However, in light of the colder than expected February and the shortfall of supply in the market, the Agreement was a financial success for BC Hydro.

3.314.1 Please quantify the "financial success" that BC Hydro generated as a result of the Amended 2018 Letter Agreement. As part of the response, please describe what proportion of the COE variance between the 2019 RRA and actual costs was attributable to the Amended 2018 Letter Agreement.

RESPONSE:

BC Hydro entered the 2018 Letter Agreement as a prudent risk management decision, regardless of whether BC Hydro system conditions improved or worsened and/or market prices increased or decreased over the balance of the winter. Accordingly, the primary purpose and success of the agreement is in its risk reduction.

1 https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.

2 https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/fep/00-2019-05-23-bchydro-bcuc-wm.pdf.

It is difficult to accurately estimate what the costs would have been had BC Hydro used spot market purchases or Island Generation as the timing and availability of purchases absent the 2018 Letter Agreement cannot be known. Absent the certainty of supply to import a specified volume of firm imports, provided by the 2018 Letter Agreement, BC Hydro would have set a higher Threshold Purchase Price and would have purchased more energy as the shortfall position worsened.

The following tables compare the cost of the Energy Supply Contract (US$91.3 million) to the hypothetical cost of alternative sources of energy from Island Generation and the Spot Market (totaling US$189.5 million).

	Energy (GWh)	Average Price (US$/MWh)	Cost (US$ millions)
Energy Supply Contract (as of March 1)	**2,428**	**37.59**[3]	**91.3**

Hypothetical Cost of Alternative Sources of Energy	Energy (GWh)	Average Price (US$/MWh)	Cost (US$ millions)
Island Generation (February to April)[4]	**528**	**126.29**	**66.7**
Spot Market (January to April)[5]	**1,900**	**64.61**	**122.8**
Total	**2,428**	**78.04**	**189.5**

[3] **This is the weighted average price BC Hydro paid to Powerex under the Agreement.**

[4] **ICG generation costs based on assumed 90 per cent availability, using actual Sumas gas prices to March 7 and forward prices for the balance of the forecast horizon (including gas transportation and carbon tax costs).**

[5] **Spot market costs based on average monthly prices and assume imports at levels that result in 660 MW across the January to April period, using actual Mid-C prices to March 7 and forward prices for the balance of the forecast horizon (including wheeling costs).**

British Columbia Utilities Commission Information Request No. **3.314.5** Dated: **September 19, 2019** British Columbia Hydro & Power Authority Response issued **October 10, 2019**	Page 1 of 2
British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-16**

314.0 E. CHAPTER 4 – COST OF ENERGY

Reference: COST OF ENERGY
Exhibit B-11, pp. 7–8; California Independent System Operator (ISO), Western Energy Imbalance Market (EIM), Quarterly Gross Benefits;[1] BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases, as amended (Amended 2018 Letter Agreement), dated May 23, 2019,[2] p. 2; BC Hydro Application for 2019 Letter Agreement with Powerex Corp. (2019 Letter Agreement) proceeding, Exhibit B-1, p. 4
Market opportunities

On page 4 of the application to the BC Hydro 2019 Letter Agreement proceeding, it states:

> As noted above, and in contrast to the 2018 Letter Agreement, BC Hydro's intention in entering into the 2019 Letter Agreement was to proactively ensure appropriate measures are in place to respond to future physical supply issues.

BC Hydro states in the Evidentiary Update:

> The Cost of Energy forecast in the Application was based on BC Hydro's October 2018 energy study, The Cost of Energy forecast in the Evidentiary Update is based on the June 2019 energy study.
>
> Dry conditions and lower water inflows have decreased planned hydroelectric generation (water rentals) and purchases from IPPs and Long-Term Commitments.

3.314.5 Please explain whether BC Hydro expects a similar level of "financial success" with the 2019 Letter Agreement. In the response, please discuss whether expected financial results of the 2019 Letter Agreement have been factored into either of the Powerex net income or COE estimates. If not, please quantify both the total volume and cost of market electricity purchases that are anticipated in each of F2020 and F2021.

1 https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.

2 https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/fep/00-2019-05-23-bchydro-bcuc-wm.pdf.

British Columbia Utilities Commission Information Request No. **3.314.5** Dated: **September 19, 2019** British Columbia Hydro & Power Authority Response issued **October 10, 2019**	Page 2 of 2
British Columbia Hydro & Power Authority **Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**	**Exhibit: B-16**

RESPONSE:

BC Hydro entered the 2019 Letter Agreement proactively to ensure appropriate measures were in place to respond to future physical supply issues. The ability to acquire wholesale electricity from Powerex on a forward basis remains a valuable tool for BC Hydro to have available to address short-term operational requirements. The primary purpose and expected success of the agreement is in its risk reduction.

The Cost of Energy estimate from Evidentiary Update includes all costs and energy deliveries under the 2019 Letter Agreement that were confirmed as of June 20, 2019.

Trade Income for fiscal 2020 and fiscal 2021 is based on the five-year average from fiscal 2014 to fiscal 2018. It does not include any forecast of transactions under the 2019 Letter Agreement.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 9.4
Supply risks

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement was entered into proactively to ensure appropriate measures are in place should similar supply issues arise from time to time and generally to allow BC Hydro to manage the type of risks that led to the 2018 Letter Agreement in a timely way."

BC Hydro further states on page 6:

> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

In response to BCUC IR 9.4, BC Hydro stated:

> The need for forward purchases continues even though the T-South capacity has increased. BC Hydro's forward purchases are being made to meet expected domestic needs, considering the risk associated with spot market supply availability from Powerex for the Winter 2018/19 season. Although there have been some improvements in the T-South capacity, BC Hydro understands that western spot market supply availability to Powerex remains relatively limited given (1) low natural gas storage levels for this time of year in the west; (2) de-rates to T-South capacity down to approximately 70 per cent for the month of March, associated with scheduled inspections that are planned to continue through the summer of 2019; (3) higher demand in the Pacific Northwest associated with colder weather, particularly in February; (4) lower hydro conditions in the US Pacific Northwest; and (5) a continued trend of reduced spot market liquidity over the past decade.

1.3.6 Has BC Hydro identified any risks to the wholesale electricity market in the Pacific Northwest that could arise as a result of BC Hydro entering into the 2019 Letter Agreement? Please discuss.

RESPONSE:

No. BC Hydro is not aware of any risks to the wholesale market that could arise from the 2019 Letter Agreement. Please also refer to BC Hydro's response to BCUC IRs 1.2.7.2 and 1.2.9.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 9.4
Supply risks

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement was entered into proactively to ensure appropriate measures are in place should similar supply issues arise from time to time and generally to allow BC Hydro to manage the type of risks that led to the 2018 Letter Agreement in a timely way."

BC Hydro further states on page 6:

> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

In response to BCUC IR 9.4, BC Hydro stated:

> The need for forward purchases continues even though the T-South capacity has increased. BC Hydro's forward purchases are being made to meet expected domestic needs, considering the risk associated with spot market supply availability from Powerex for the Winter 2018/19 season. Although there have been some improvements in the T-South capacity, BC Hydro understands that western spot market supply availability to Powerex remains relatively limited given (1) low natural gas storage levels for this time of year in the west; (2) de-rates to T-South capacity down to approximately 70 per cent for the month of March, associated with scheduled inspections that are planned to continue through the summer of 2019; (3) higher demand in the Pacific Northwest associated with colder weather, particularly in February; (4) lower hydro conditions in the US Pacific Northwest; and (5) a continued trend of reduced spot market liquidity over the past decade.

1.3.6 Has BC Hydro identified any risks to the wholesale electricity market in the Pacific Northwest that could arise as a result of BC Hydro entering into the 2019 Letter Agreement? Please discuss.

1.3.6.1 Does the 2019 Letter Agreement introduce new or exacerbate any existing supply risks? Please discuss.

RESPONSE:

No. The 2019 Letter Agreement reduces supply risk by providing an additional mechanism to acquire electricity from Powerex. Please also refer to BC Hydro's response to BCUC IR 1.3.5.

3.0 A. MARKET DYNAMICS

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2–6; BC Hydro responses to confidential BCUC IR No. 1, 2018 Letter Agreement Application, dated March 15, 2019, BCUC IR 9.4
Supply risks

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement was entered into proactively to ensure appropriate measures are in place should similar supply issues arise from time to time and generally to allow BC Hydro to manage the type of risks that led to the 2018 Letter Agreement in a timely way."

BC Hydro further states on page 6:

> On a go-forward basis BC Hydro observes that, since the beginning of the current fiscal year, it has continued to have low system inflows, and has no basis to believe that the long-term decline in day-ahead market liquidity will quickly reverse itself. There are numerous other events that could result in similar supply shortfalls that threatened BC Hydro last winter, which may not reliably be addressed through purchases from Powerex on a day-ahead basis under the 2003 TPA. In these circumstances, BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

In response to BCUC IR 9.4, BC Hydro stated:

> The need for forward purchases continues even though the T-South capacity has increased. BC Hydro's forward purchases are being made to meet expected domestic needs, considering the risk associated with spot market supply availability from Powerex for the Winter 2018/19 season. Although there have been some improvements in the T-South capacity, BC Hydro understands that western spot market supply availability to Powerex remains relatively limited given (1) low natural gas storage levels for this time of year in the west; (2) de-rates to T-South capacity down to approximately 70 per cent for the month of March, associated with scheduled inspections that are planned to continue through the summer of 2019; (3) higher demand in the Pacific Northwest associated with colder weather, particularly in February; (4) lower hydro conditions in the US Pacific Northwest; and (5) a continued trend of reduced spot market liquidity over the past decade.

1.3.7 Please identify any other reasons to explain spot market supply availability that have not yet been stated.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.3.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.1 Please discuss the circumstances under which BC Hydro would terminate the 2019 Letter Agreement.

RESPONSE:

BC Hydro will terminate the 2019 Letter Agreement when BC Hydro and Powerex revise the 2003 TPA.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.2 Given the TPA worked well in a consistently liquid wholesale day-ahead market and the 2018 Letter Agreement was in response to physical supply issues in 2018/2019, please explain why BC Hydro seeks to enter into the 2019 Letter Agreement which does not have a fixed term or expiry date?

RESPONSE:

The 2019 Letter Agreement is an enabling agreement that allows, but does not obligate, BC Hydro to enter into forward physical energy purchase transactions with Powerex. Such agreements do not necessarily require a termination date

since they are enabling frameworks rather than the specific transactions in and of themselves. The 2018 Letter Agreement worked well for its intended purpose but it was time bound for the immediate need. BC Hydro determined that the ability to purchase forward physical energy from Powerex is a useful additional option to have to manage its operational needs. As noted in the application, the 2019 Letter Agreement is intended to be a bridging mechanism until the 2003 TPA can be revised.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.2 Given the TPA worked well in a consistently liquid wholesale day-ahead market and the 2018 Letter Agreement was in response to physical supply issues in 2018/2019, please explain why BC Hydro seeks to enter into the 2019 Letter Agreement which does not have a fixed term or expiry date?

1.4.2.1 Please discuss how BC Hydro can ensure that without an expiry date, the 2019 Letter Agreement remains suitable in a dynamic wholesale power market?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.4.2.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.3 Did BC Hydro consider alternative proposals related to the term or expiry date of the 2019 letter Agreement?

RESPONSE:

Yes, BC Hydro did consider alternatives to the term and expiry date of the 2019 Letter Agreement. Please refer to BC Hydro's response to BCUC IR 1.4.2 for a description of why a bridging agreement is needed until an updated TPA is entered into.

The alternatives considered are listed below along with an explanation of why the 2019 Letter Agreement was chosen.

Option 1: Advance the filing of an updated TPA to the summer of 2019, and include provisions in the agreement for the transition to the new agreement across fiscal 2020.

The new agreement was not sufficiently advanced for this to be a viable option, so this option was discarded.

Option 2: Amend and extend the existing confidential 2018 Letter Agreement.

While this option was considered, BC Hydro was also in the process of releasing the 2018 Letter Agreement publicly and finalizing the regulatory process regarding it. As a result, this option was discarded.

Option 3: Signing another one year agreement for fiscal 2020.

This was considered a viable option. However, it would not have been an appropriate bridging mechanism to the updated TPA given the uncertainties regarding its completion.

Option 4: New multi-year agreement (2019 Letter Agreement).

This option was chosen to be a bridging agreement until an updated TPA becomes effective.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.3 Did BC Hydro consider alternative proposals related to the term or expiry date of the 2019 letter Agreement?

1.4.3.1 If yes, why were alternative proposals not chosen?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.4.3.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.3 Did BC Hydro consider alternative proposals related to the term or expiry date of the 2019 letter Agreement?

1.4.3.2 If not, why not?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.4.3.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.4 What alternatives, if any, does BC Hydro have to the 2019 Letter Agreement? Please explain.

RESPONSE:

Other than advancing the update of the 2003 TPA, BC Hydro does not have any alternatives to the 2019 Letter Agreement to secure physical wholesale electricity from Powerex on a forward basis. The 2003 TPA provides BC Hydro with the ability to purchase spot market electricity from Powerex at day-ahead prices. As discussed in the Application, BC Hydro is updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward physical transactions.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.5 In the event that the 2019 Letter Agreement was not found to be in the public interest in its current form, how would BC Hydro restructure the Letter Agreement? Please discuss.

RESPONSE:

BC Hydro's response to a BCUC determination that the 2019 Letter Agreement was not in the public interest would depend on the reasons for the BCUC's determination, any order the BCUC made in consequence of such a determination, BC Hydro's operational supply circumstances at the time, the status of BC Hydro's efforts to update the 2003 TPA, and other related considerations. This would be true even if the reason the BCUC determined the 2019 Letter Agreement to be not in the public interest was solely on account of it not having a termination date.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.5 In the event that the 2019 Letter Agreement was not found to be in the public interest in its current form, how would BC Hydro restructure the Letter Agreement? Please discuss.

1.4.5.1 Would a restructured Letter Agreement include an expiry or termination date? Please explain why or why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.4.5.

4.0 B. NEED FOR 2019 LETTER AGREEMENT

Reference: NEED FOR 2019 LETTER AGREEMENT AND THE 2003 TRANSFER PRICING AGREEMENT
Exhibit B-1, pp. 2, 5–6
Duration of the 2019 Letter Agreement

On page 2 of the Application, BC Hydro states: "the 2019 Letter Agreement is a longer term arrangement in effect until terminated by either party. That is, the 2019 Letter Agreement does not have a fixed term or expiry date."

BC Hydro states on page 5:

> The 2003 TPA has worked well in the context of a consistently liquid wholesale day-ahead market for electricity in the Pacific Northwest. As such, the 2003 TPA did not provide, and did not need to provide, any mechanism for forward physical sales or purchases between BC Hydro and Powerex.
>
> Over the past decade there has been a steady decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest; that was one of the factors that prompted the 2018 Letter Agreement as a solution to the impending electricity supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases under the 2003 TPA.

On page 6 of the Application, BC Hydro states:

> BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions… to the extent that Powerex and BC Hydro do update the 2003 TPA for that purpose, the 2019 Letter Agreement can be considered a bridging mechanism.

1.4.6 Please confirm, or explain otherwise, that BC Hydro would terminate the 2019 Letter Agreement in the event BC Hydro and Powerex update the 2003 TPA.

RESPONSE:

Confirmed. Please refer to BC Hydro's response to BCUC IR 1.4.1.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.1 Please explain what is meant by short-term operational requirements.

RESPONSE:

The operating time horizon is zero to three years. This is the time horizon within which the Generation System Operations business group has accountability to plan the use of generation resources that are available to BC Hydro to ensure that load serving obligations are met. The 2019 Letter Agreement was signed in the context of this operating time horizon and is another tool available to Generations System Operations to use to respond to changing system and market conditions.

As described in BC Hydro's response to BCUC IR 1.3.2, April to early May is when the annual minimum elevation of system storage is reached and there is a risk of not meeting operational needs in a cold and dry spring if the system storage is drafted too deep too soon. In the context of the 2019 Letter Agreement "short-term operational requirements" is primarily referring to requirements to manage the system reservoirs to reduce the risk of drafting below minimum reservoir elevation constraints. The 2019 Letter Agreement also provides the flexibility to secure imports in a particular month when imports are required to meet load due to major planned outages in the system.

Because the BC Hydro system is in planning surplus under average water conditions, the 2019 Letter Agreement is only useful to BC Hydro to secure forward purchases of electricity within the year when there may be a known deficit in the operating time frame. In the operational context for which the 2019 Letter Agreement is used, "short-term" therefore applies to the Delivery Term requested by BC Hydro. Please refer to BC Hydro's response to BCUC IR 1.6.4 for a further

discussion of how BC Hydro specifies a Delivery Term. For example, BC Hydro could make a request in September for deliveries of energy from October through March, or alternatively might make a request in September for deliveries in January.

As noted in BC Hydro's response to BCUC IR 1.3.2, the 2019 Letter Agreement does not provide the flexibility to request energy for delivery in the current month.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.1 Please explain what is meant by short-term operational requirements.

1.5.1.1 Does short-term refer to a maximum forward contract duration or the maximum forward delivery period? For example, would this indicate delivery of electricity that begins now for a six-month period, or would delivery begin six months from now? Please explain.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.2 Please explain what is meant by operating time horizon.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.3 How would BC Hydro manage any shortfalls in supply in the absence of the 2019 Letter Agreement and forward power purchases? Please elaborate.

RESPONSE:

In the absence of the 2019 Letter Agreement, BC Hydro would have to rely on other available energy options to manage shortfalls in supply, including:

- **Purchasing and importing energy by setting a Threshold Purchase Price under the 2003 TPA; and**
- **Generating from the natural gas fueled Island Generation plant.**

The need for the 2019 Letter Agreement and its use for risk management is discussed in BC Hydro's response to BCUC IR 1.3.2.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.4 Can BC Hydro sell any forward power purchased surplus to demand back into the real time or day-ahead market? Please discuss.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.1, for a description of how the 2019 Letter Agreement operates alongside the 2003 TPA.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.4 Can BC Hydro sell any forward power purchased surplus to demand back into the real time or day-ahead market? Please discuss.

1.5.4.1 Please explain the benefits to ratepayers, if any.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.1.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

BC Hydro states on page 3 of its Application:

> [T]he 2019 Letter Agreement is an additional tool for BC Hydro to employ to address short-term operational requirements. It does so by allowing BC Hydro to secure physical wholesale electricity from Powerex on a forward basis (ie outside of the pre-schedule day-ahead wholesale markets) but still within the operating time horizon. There is no other mechanism currently in place that allows BC Hydro to purchase wholesale electricity in that manner.

1.5.5 Does the ability to transact on the day-ahead market through the TPA and longer term though the 2019 Letter Agreement allow BC Hydro to arbitrage price differentials? Please discuss, including ratepayer benefit, if any.

RESPONSE:

The public version of this response has been redacted to maintain confidentiality over commercially sensitive information. The un-redacted version of the response is being made available to the BCUC only, in order to protect the customer's commercial interests.

No. BC Hydro purchases from Powerex through the 2019 Letter Agreement based on the [redacted] to meet its load serving obligations and to manage supply risk in the operational time frame. Separately, BC Hydro may later sell surplus energy to Powerex based on the day-ahead Mid-C market index under the 2003 TPA in response to evolving operational conditions. On an after the fact basis, this may result in BC Hydro having purchased forward energy from Powerex to meet a forecasted operational need and later selling surplus energy in the same delivery period to Powerex under the 2003 TPA. Importantly, these transactions are not executed to arbitrage price differentials. Powerex is the entity that engages in arbitraging price differentials and the benefits of this activity flow back to ratepayers via Trade Income.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

On page 6 of its Application, BC Hydro states:

> BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

1.5.6 Please define the term "cost-effective" as stated in the preamble.

RESPONSE:

"Cost-effective" is a term used by the Commission, flexibly and depending on context, where the legal threshold for a Commission order requires consideration of the public interest.

The Commission's July 7, 2006 decision in regard to the application by the British Columbia Transmission Corporation (BCTC) for a "certificate of public convenience and necessity" for the Vancouver Island Transmission Reinforcement Project (VITR) is illustrative. In that decision the Commission said, at page 15:

> **"The Commission Panel accepts the submissions of BCTC that there is a broad range of interests that should be considered in determining whether an applied-for project is in the public convenience and necessity….**
>
> **The task is not to select the least cost project, but to select the most cost-effective project. Therefore, as suggested by BC Hydro, reliability, safety, schedule, financing arrangements and other factors itemized in the Vancouver Island Gas Project (VIGP) Decision and revised by BC Hydro are also relevant to the task before the Commission Panel."**

The legal framework for "energy supply contracts" empowers the Commission, after a hearing, to determine them not in the "public interest" (UCA section 71(2)). It follows that the same flexible and context-specific approach inherent in the term cost-effectiveness that is used to assess the public convenience and necessity

should be used to assess whether an energy supply contract may not be in the public interest.

BC Hydro believes that the primary factors relevant to a public interest assessment of the 2019 Letter Agreement are its ability to allow BC Hydro to meet its obligations to manage the potential physical energy supply issues that prompted the agreement, and its ability to do so on an economic basis. Because the 2019 Letter Agreement provides for the procurement of forward physical electricity, and does so on the basis of wholesale market prices, it enables BC Hydro to meet those obligations in a cost-effective manner, and is therefore in in the public interest.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

On page 6 of its Application, BC Hydro states:

> BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

1.5.7 Please explain how the 2019 Letter Agreement provides a cost-effective way to manage electricity shortages.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.6.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

On page 6 of its Application, BC Hydro states:

> BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

1.5.8 Please discuss how BC Hydro measures the cost-effectiveness of forward purchases made under the 2019 Letter Agreement when the day-ahead price of a future delivery period is unknown.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.8.1

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

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1.5.8 Please discuss how BC Hydro measures the cost-effectiveness of forward purchases made under the 2019 Letter Agreement when the day-ahead price of a future delivery period is unknown.

1.5.8.1 Is the 2019 Letter Agreement more cost-effective than the transacting on the day-ahead market through the 2003 TPA? Please elaborate.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.6 for a description of "cost-effective" and the primary factors relevant to a public interest assessment of the 2019 Letter Agreement.

Please refer to BC Hydro's response to BCUC IR 1.2.4.1 for a description on how reduced market liquidity can result in less volume being purchased than desired on a given day, and challenges that can result in having to meet domestic deficits as well as increased costs associated with having to spread out domestic purchases over a greater number of days, including higher priced days, to achieve the desired purchase volume.

5.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, pp. 3–6
2019 Letter Agreement mechanism

On page 6 of its Application, BC Hydro states:

> BC Hydro believes it is prudent and in the interests of its ratepayers to have in place an additional mechanism that will allow it to respond to system conditions and reliably manage potential electricity shortages in a timely and cost-effective way. The 2019 Letter Agreement serves this objective.

1.5.9 Do cost savings as a result of transactions made through the 2019 Letter Agreement directly affect the ratepayer? Please elaborate.

RESPONSE:

The intent of the purchases under both the 2018 Letter Agreement and 2019 Letter Agreement was to procure energy to respond to system conditions and manage supply risks in a timely and cost effective way. The costs of purchases under both agreements will be recovered from the ratepayer no differently than if the purchases were made under the 2003 TPA. To the extent there are cost savings compared to other reasonable and acceptable alternatives, these cost savings are reflected in the cost of energy.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

On page 3 of the Application, BC Hydro states:

> A Purchase Interest Request is a binding written offer to purchase wholesale electricity from Powerex on its terms, including the maximum price that BC Hydro is willing to pay, maximum volumes of electricity, and delivery period(s). In response to a Purchase Interest Request, Powerex is obliged to use commercially reasonable efforts to sell and deliver wholesale electricity on a forward basis to BC Hydro, as confirmed in writing in an instrument referred to as a 'Confirmation'. When the deliveries of electricity contemplated by the Confirmation are made, BC Hydro pays for the electricity at the price as detailed in the Confirmation in accord with the pricing mechanism in the 2019 Letter Agreement. Generally, that price is a wholesale market price.

1.6.1 Does the maximum price included in the Purchase Interest Request provide Powerex with flexibility regarding the price it transacts at on BC Hydro's behalf? Please explain.

RESPONSE:

Powerex does not transact on behalf of BC Hydro in wholesale electricity markets. Powerex independently acquires energy at a variety of locations and market prices to meet its entire sale obligations, including those associated with Confirmations that arise from a Purchase Interest Request. Powerex has full flexibility regarding the prices it transacts at in wholesale markets. The price that BC Hydro pays to Powerex does not affect this flexibility.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
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1.6.2 Does the 2019 Letter Agreement allow for a price within the Purchase Interest Request that is not a wholesale market price? Please explain.

RESPONSE:

In the 2019 Letter Agreement, BC Hydro and Powerex have agreed on the "Contract Price" for electricity. The Contract Price represents the energy cost as well as a reasonable estimate of the fixed and variable transmission costs that would be incurred by Powerex for delivery of electricity to the B.C. borders.

The 2019 Letter Agreement also provides that the Contract Price may be adjusted by agreement of the parties in writing. However, BC Hydro and Powerex only intended to enable the parties to amend the Contract Price in one of two ways: 1) if the estimate of the fixed and variable transmission costs is no longer reasonable; and 2) to change the wholesale market price to a different wholesale market price if the original is no longer published. There was no intent to enable the parties to agree on a price for energy other than a wholesale market price.

Accordingly, BC Hydro commits that it will not agree to amend the Contract Price other than as described above and has reflected that commitment in an amended proposed order filed with these IR responses.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
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1.6.3 Please discuss whether an alternative price to a wholesale market price could be specified in a Purchase Interest Request.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.2

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

BC Hydro states on page 8 of Appendix 1 to the Application: "'Delivery Term' means the period comprising one or more continuous Delivery Periods as set forth in a Purchase Interest Request."

Page 9 of Appendix 1 to the Application states: "'Maximum Quantity', as specified in the initial and any revised Purchase Interest Request, means the total maximum quantity (in MWh) for all Transactions (in aggregate) for the applicable Delivery Term."

Page 2 of Appendix 1 to the Original 2018 Filing (attached to the 2018 Letter Agreement Application) states: "Delivery Period: full calendar month(s) for delivery of electricity during the Delivery Term."

Page 7 of Appendix 1 to the Original 2018 Filing states: "'Delivery Term' means December 1, 2018, through June 30, 2019, inclusive, unless extended by mutual agreement of the parties."

1.6.4 Please define the minimum and maximum limits of an individual Delivery Period as set forth in a Purchase Interest Request in the current Letter Agreement. For example, could BC Hydro enter into a 10-year Delivery Period to purchase forward market electricity?

RESPONSE:

In a Purchase Interest Request, BC Hydro specifies a Delivery Term, which is defined in Schedule A to the 2019 Letter Agreement as "the period comprising one or more continuous Delivery Periods". When Powerex provides a Confirmation, it confirms the "Delivery Period" for the electricity supplied pursuant to the specific Confirmation.

The length of a Delivery Term specified by BC Hydro in a Purchase Interest Request is not expressly constrained, but BC Hydro will use the 2019 Letter Agreement to manage supply issues only in the short-term operational timeframe. Please refer to BC Hydro's response to BCUC IR 1.5.1 for a further discussion of what is meant by the "short-term operational timeframe". To that end, BC Hydro commits that it will not specify a Delivery Term that is greater than three years in length, and has reflected that commitment in an amended proposed order filed with these IR responses.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
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Page 2 of Appendix 1 to the Original 2018 Filing (attached to the 2018 Letter Agreement Application) states: "Delivery Period: full calendar month(s) for delivery of electricity during the Delivery Term."

Page 7 of Appendix 1 to the Original 2018 Filing states: "'Delivery Term' means December 1, 2018, through June 30, 2019, inclusive, unless extended by mutual agreement of the parties."

1.6.4 Please define the minimum and maximum limits of an individual Delivery Period as set forth in a Purchase Interest Request in the current Letter Agreement. For example, could BC Hydro enter into a 10-year Delivery Period to purchase forward market electricity?

1.6.4.1 If there are no minimum or maximum limits on the Delivery Period, please discuss the advantages and disadvantages of an undefined Delivery Term.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.4 where BC Hydro confirms that it will not request a Delivery Term in excess of three years. Please also refer to BC Hydro's response to BCUC IR 1.5.1 where BC Hydro describes how it intends to use the 2019 Letter Agreement to meet its operational needs within the short-term operational timeframe. Since the 2019 Letter Agreement may be used in more than one season, the benefit of leaving an undefined Delivery Term is that BC Hydro is provided flexibility for it to address its needs over each winter period. BC Hydro does not see any disadvantages with providing BC Hydro with the discretion to specify a Delivery Term.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
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BC Hydro states on page 8 of Appendix 1 to the Application: "'Delivery Term' means the period comprising one or more continuous Delivery Periods as set forth in a Purchase Interest Request."

Page 9 of Appendix 1 to the Application states: "'Maximum Quantity', as specified in the initial and any revised Purchase Interest Request, means the total maximum quantity (in MWh) for all Transactions (in aggregate) for the applicable Delivery Term."

Page 2 of Appendix 1 to the Original 2018 Filing (attached to the 2018 Letter Agreement Application) states: "Delivery Period: full calendar month(s) for delivery of electricity during the Delivery Term."

Page 7 of Appendix 1 to the Original 2018 Filing states: "'Delivery Term' means December 1, 2018, through June 30, 2019, inclusive, unless extended by mutual agreement of the parties."

1.6.5 Please define the term "short-term" as it relates to "short-term operational needs." As part of your response, please explain whether the period over which short-term operational needs are required sets the maximum limit of an individual Delivery Period.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 for a description of the operating time horizon and short-term operational requirements. Please note that 'short-term operational requirements' and 'short-term operational needs' are used interchangeably and have the same meaning.

As described in BC Hydro's response to BCUC IR 1.6.4, the length of a Delivery Term BC Hydro specifies in a Purchase Interest Request is not constrained other than to require it be set in full calendar months. In implementing the 2019 Agreement, the Delivery Term is the period of time covered by those continuous months during which BC Hydro requires electricity. The period over which BC Hydro has short-term operational needs sets the time period of the Delivery Term.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

BC Hydro states on page 1 of Appendix 1 to the Original 2018 Filing:

> Purchase Interest Request. During the term, BC Hydro may deliver to Powerex a binding written offer to purchase electricity on a forward basis ('Purchase Interest Request'). A Purchase Interest Request shall be substantially in the form set forth in Schedule 'B' and, at a minimum, shall specify [redacted], the maximum hourly quantity (in MW) flat across all Peak Hours or Off-Peak Hours (or both) for each Delivery Period (as defined in Section 5) and the total quantity (in MWh) for the entire Delivery Term ('Maximum Quantity').

1.6.6 Please explain why the Purchase Interest Request in the 2018 Letter Agreement specified the total quantity (in MWh) for the entire delivery term (Maximum Quantity), but the 2019 Letter Agreement does not.

RESPONSE:

Purchase Interest Requests issued by BC Hydro under the 2019 Letter Agreement do include a Maximum Quantity for each Delivery Term as specified in Section 3 on page 1 of the 2019 Letter Agreement. The term "Maximum Quantity" is defined in Schedule A of the 2019 Letter Agreement. As there may be multiple Purchase Interest Requests issued by BC Hydro for different Delivery Terms throughout the term of the 2019 Letter Agreement, a maximum quantity was not specified for the 2019 Letter Agreement as a whole.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
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1.6.7 Please define the maximum Delivery Term as set forth in a Purchase Interest Request in the 2019 Letter Agreement. For example, could BC Hydro enter into a Delivery Term comprised of consecutive 10-Year Delivery Periods?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.4 where BC Hydro has confirmed that there is no maximum Delivery Term but BC Hydro has committed to not issue a Purchase Interest Request with a Delivery Term greater than three years.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

BC Hydro states on page 1 of Appendix 1 to the Original 2018 Filing:

> Purchase Interest Request. During the term, BC Hydro may deliver to Powerex a binding written offer to purchase electricity on a forward basis ('Purchase Interest Request'). A Purchase Interest Request shall be substantially in the form set forth in Schedule 'B' and, at a minimum, shall specify [redacted], the maximum hourly quantity (in MW) flat across all Peak Hours or Off-Peak Hours (or both) for each Delivery Period (as defined in Section 5) and the total quantity (in MWh) for the entire Delivery Term ('Maximum Quantity').

1.6.8 Please provide the steps followed in purchasing wholesale market electricity under the 2019 Letter Agreement, beginning with the submission of a Purchase Interest Request and ending with how parameters specified in the Purchase Interest Request are met. As part of your response, please explain how BC Hydro ensures that the volume and price of electricity purchased are sufficient to satisfy short-term operating needs.

RESPONSE:

The steps followed by BC Hydro and Powerex are:

1. **Submit a Purchase Interest Request to Powerex;**
2. **Powerex identifies market opportunities consistent with the Purchase Interest Request. Upon doing so they issue a Confirmation to BC Hydro;**
3. **As Confirmations are received, BC Hydro incorporates purchases into the Energy Studies and other operational tools to reflect the forward purchase commitments. For example, if Powerex confirms a transaction of 200 MW in peak hours in February at a specified price, this information will be incorporated into the Energy Studies as a fixed supply resource; and**

4. If and as required, BC Hydro adjusts the Purchase Interest Request to Powerex (i.e. increase or decrease any of the parameters specified in the request) or issues a new Purchase Interest Request.

BC Hydro uses the Energy Studies to inform decisions about the volume and prices to specify in its Purchase Interest Requests to Powerex.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

Page 9 of Appendix 1 to the Application states that: "References to 'Dollars' or to '$' are to United States Dollars."

1.6.9 Please confirm, or explain otherwise, that BC Hydro will settle any transactions made with Powerex in Canadian Dollars.

RESPONSE:

Confirmed.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

Page 9 of Appendix 1 to the Application states that: "References to 'Dollars' or to '$' are to United States Dollars."

1.6.9 Please confirm, or explain otherwise, that BC Hydro will settle any transactions made with Powerex in Canadian Dollars.

1.6.9.1 If confirmed, please provide the foreign exchange rate that will be used, referencing the appropriate section of the 2019 Letter Agreement.

RESPONSE:

The foreign exchange rate used to convert these transactions from USD to CAD for billing purposes is not specified in the 2019 Letter Agreement. However, the monthly average exchange rate per Bank of Canada is being used and this is consistent with the rate used for transactions under the 2003 TPA between BC Hydro and Powerex.

6.0 C. CONTRACT TERMS

Reference: DESCRIPTION OF THE 2019 LETTER AGREEMENT PRICING AGREEMENT
Exhibit B-1, p. 3; Appendix 1, pp. 8–9; BC Hydro Letter Agreement between BC Hydro and Powerex Corp. – Forward Electricity Purchases (Original 2018 Filing), dated December 6, 2018, Appendix 1, pp. 1, 2, 7
Terms of Purchase Interest Request

Page 9 of Appendix 1 to the Application states that: "References to 'Dollars' or to '$' are to United States Dollars."

1.6.9 Please confirm, or explain otherwise, that BC Hydro will settle any transactions made with Powerex in Canadian Dollars.

1.6.9.2 If not confirmed, please explain how BC Hydro will settle transactions with Powerex in U.S. Dollars.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.9.