

Fred James

Chief Regulatory Officer

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May 19, 2020

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

Dear Mr. Wruck:

**RE: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application – Freshet
Rate Component
Exhibits Revision Request**

BC Hydro is writing to the BCUC to request that certain information presently on the public record of the above-referenced proceeding be removed from the public record and replaced with redacted versions for reasons of commercial sensitivity. The information at issue was submitted by BC Hydro, and we inadvertently did not identify the information as confidential at the time of filing.

The information at issue is the proportions of time each of the three conditions applied during the 2019 freshet period. A third-party could use this information to predict BC Hydro's electricity import and export requirements to the detriment of BC Hydro and its ratepayers. BC Hydro declined to provide this information in response to the BCOAPO IR 1.9.5 in the proceeding, for example, but inadvertently did not redact the information in the response to BCUC IR 1.8.2. Unfortunately, the information provided in that response is also repeated in the preamble of the BCUC's Pre-filed Question 3.0 for the Streamlined Review Process (SRP) and in the preamble to Clean Energy Association BC's (CEABC) Information Request 9.0. Thus, the information is presently on the public record in the following places:

- Exhibit A2-1, BCUC Staff Information Request No. 2, Pre-filed Question 3;
- Exhibit A-5, Appendix A, Question 3.0;
- Exhibit B-4, BC Hydro's response to BCUC IR 1.8.2 (including Attachment 1);
- Exhibit B-6, the preamble to BC Hydro's response to BCUC Pre-filed Question 3.0 for the SRP;
- Exhibit B-7, the preamble to BC Hydro's response to BCUC Information Request 2 series 2C, 2D and 2E;

- Exhibit B-8, the preamble to BC Hydro's response to CEABC Information Request 9 series and IRs 9.1, 9.4 and 9.7; and
- Exhibit C6-3, the preamble to CEABC Information Request 9 series and IRs 9.1, 9.4 and 9.7.¹

BC Hydro separately submits both a confidential as well as a public version of the Exhibits listed above with the confidential information redacted. The requested change to the record will not prejudice any party in the proceeding given that final arguments have already been submitted and BCUC Order No. G-104-20 has been issued.

There is a risk that an intervener or a third-party has downloaded the confidential information onto their own computer system; however, BC Hydro does not have a basis to ask such parties to delete the information nor do we want to draw attention to the information. Therefore, we will not be taking any action in that regard.

To avoid drawing attention to the confidential information, BC Hydro requests that the BCUC not place the letter on the public record of the proceeding until after the identified Exhibits have been replaced with the redacted versions. BC Hydro is only providing a copy of this letter to CEABC, because we are requesting that certain of its information requests, and BC Hydro's responses to them, be redacted. BC Hydro contacted CEABC prior to filing this letter and it indicated that it does not oppose BC Hydro's request.


BC Hydro submits that it is not necessary to provide copies of this letter to the other interveners who participated in the proceeding, because their filings are not affected.

¹ BC Hydro is requesting that the proportions of time each of the three conditions applied during the 2019 freshet period be redacted, as well as certain quantities calculated or estimated from those proportions (such as the volumes of energy sold during each condition and the losses per MWh). BC Hydro is also requesting the quantities calculated or estimated from the proportions be redacted because these quantities could be used to back-calculate the proportions of time each of the three conditions applied.

May 19, 2020
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Transmission Service Market Reference-Priced Rates Application – Freshet Rate
Component
Exhibits Revision Request

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

rz/ma

Enclosure

Copy to: **Clean Energy Association of B.C.**
Attention: David Austin
daustin@stirlingllp.com



bcuc
British Columbia
Utilities Commission

Patrick Wruck
Commission Secretary

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March 12, 2020

Sent via eFile/email

BCH TRANSMISSION SERVICE MARKET REFERENCE- PRICED RATES	EXHIBIT A2-1
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To: British Columbia Hydro and Power Authority
Registered Interveners

**Re: British Columbia Hydro and Power Authority – Transmission Service Market Reference-Priced Rates
Application – Project 1599053 – Staff Information Request No. 2**

Further to the British Columbia Utilities Commission (BCUC) Order G-49-20, in accordance with the regulatory timetable established in that order, BCUC staff is submitting the attached questions that would have been asked at the Streamlined Review Process.

Sincerely,

Original signed by:

Patrick Wruck
Commission Secretary

LC/jo
Enclosure

British Columbia Hydro and Power Authority
Transmission Service Market Reference-Priced Rates Application

**BCUC staff Information Request No. 2
in accordance with Order G-49-20**

BCUC Pre-filed Questions from Exhibit A-5	Staff Questions
Enrollment and need	
<p>1. To date, how many customers have given notice to BC Hydro to enroll for the 2020 freshet period? How does the 2020 freshet period enrollment compare to the average historical participation?</p>	<p>A. Is there a need for the Freshet Rate on a permanent basis? Given that the energy adders during the Freshet months (May, June, and July billing periods) are the same for the Freshet Rate and the Incremental Energy Rate (IER) Pilot, how many new and existing customers are going migrate away from the Freshet Rate?</p> <p>B. Has BC Hydro considered extending the Freshet Rate pilot to additional year(s) to monitor customer behaviour between the Freshet Rate and IER offerings?</p>
Curtailment criteria; economic impact; risk to ratepayers	
<p>2. In response to BCUC information request (IR) 1.9.4, BC Hydro provides its rationale for not curtailing customers for economic reasons. How will all other BC Hydro ratepayers be protected in the absence of curtailment for economic reasons? What are the benefits (and to whom would they accrue) if the curtailment criteria include economic reasons?</p> <p>3. In response to BCUC IR 1.8.2, BC Hydro states that the 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition 1: Minimum Generation with Exports approximately ■ per cent of the time, Condition 2: Minimum Generation with Imports approximately ■ per cent of the time, and Condition 3: Higher Basin Generation on the Margin approximately ■ per cent of the time. What was the split of such conditions during Years 1 to 3 of the Freshet Rate Pilot?</p>	<p>C. BC Hydro states that condition 1: Forced export will always have a net benefit to ratepayer. Condition 2: Market import will have a ratepayer loss unless the Mid-C price is sufficiently negative. Condition 3, where system storage is the marginal resource, 'Revenue gain (loss)' is a notional term as it is based on the difference between the RS 1892 Rate and the system marginal value at the time of incremental load. (Emphasis added, Exhibit B-4, BC Hydro response to BCUC IR 1.8.5)</p> <p>i. Would market imports likely incur economic losses? How likely do Mid-C prices become negative?</p> <p>ii. Should the evaluation of ratepayer economic impact consider the notional Condition 3? Should condition 1 and 2 which appear to be actual economic gains/losses be given a different weight than condition 3 which appears to be an opportunity cost calculation?</p> <p>D. One of BC Hydro's objectives for the Freshet Rate in the 2015 Rate Design Application was to assist in the management of the freshet oversupply in the BC Hydro system by providing the option to: (i) increase the ability to import cheap electricity during low priced periods; (ii) reduce the volume</p>

	<p>of surplus energy being forced to export markets; and/or (iii) reduce spill at BC Hydro facilities. (Exhibit B-1, PDF 235-236/512)</p> <p>i. How does each of the three conditions (i.e. forced export, market import, and system storage as the marginal source) contribute or reflect the three options stated above to manage the freshet oversupply in BC Hydro's system?</p> <p>E. Please provide BC Hydro's views if the BCUC's approval of the Freshet Rate application is condition upon BC Hydro including economic reasons in its curtailment criteria.</p>
Adjustments and options to offer Freshet Rate	
<p>4. Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?</p> <p>5. In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?</p>	<p>F. In 2019, when was BC Hydro able to make the assessment that low water conditions and high Mid-C prices would lead to an economic loss during the 2019 Freshet Period? Specify the month or date.</p> <p>G. What is BC Hydro's most current assessment of the water conditions and Mid-C prices for the 2020 Freshet Period and how that impacts the gains or losses during the 2020 Freshet season under Rate Schedule (RS) 1892, if it were to be offered?</p> <p>H. Based on BC Hydro's most current assessment of the water conditions and Mid-C prices for the 2020 Freshet period, if BC Hydro can predict that adverse conditions exist that may lead to losses, what are some loss mitigation strategies that BC Hydro is able to adopt?</p> <p>I. Given BC Hydro's ability to predict economic gains/loss ahead of a Freshet Rate period, discuss the feasibility and pros/cons if BC Hydro is required to submit an annual plan prior to each Freshet Rate period for BCUC review and/or approval.</p>
Water conditions and sensitivity analysis	
<p>7. Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?</p>	<p>J. Why did BC Hydro not conduct a sensitivity analysis (Exhibit B-4, BC Hydro response to BCUC IR 1.7.2)? What is the time and effort involved assuming the analysis is feasible? How is a sensitivity analysis different than BC Hydro's economic loss prediction analysis for the 2019 Freshet Rate?</p>

	<p>K. With respect to the Enbridge incident (Exhibit B-4, BC Hydro response to BCUC IR 1.8.3), BC Hydro submits that it cannot quantify how much the event had an impact on the water conditions. How did BC Hydro identify that Enbridge is a contributing factor that impacted water conditions, and what was the test?</p> <p>L. With respect to precipitation (Exhibit B-4, BC Hydro response to BCUC IR 1.7.4), have the 2019 actuals and forecast 2020 snowfall data been factored into the Freshet Rate analysis?</p> <p>M. BC Hydro has net energy imports for F2019 and forecast F2020 (Exhibit B-4, BC Hydro response to BCUC IR 1.10.1 & 1.10.3). BC's Energy Objectives includes BC being a net exporter of electricity from clean or renewable resources. How does the Freshet Rate program impact BC's energy objectives to be a net exporter?</p>
Year 4 evaluation and future evaluation	
<p>6. In response to BCSEA IR 1.5.2, BC Hydro submits that the subtraction of implementation costs, and verified load shifting costs, from the estimated revenue gains for the entire period of the Freshet Rate Pilot would have provided a more accurate indication of net financial impact. However, BC Hydro does not have verified estimates of load shifting for Year 3 and 4 of the pilot and has not provided actual implementation costs for Year 4. To the extent possible, what is BC Hydro's best estimate of load shifting and implementation costs, and what is the corresponding financial impact for each of Years 3 and 4?</p> <p>8. In response to MoveUP IR 1.3.1, BC Hydro explains its proposal to not review the Freshet Rate earlier than ten years. How, if at all, will BC Hydro, BCUC and ratepayers ensure that the Freshet Rate remains economical for all ratepayers during this ten year period?</p>	<p>N. During the ten year period, does BC Hydro do any internal monitoring of the Freshet Rate economic impacts? Does BC Hydro have any thresholds to modify or terminate the rate schedule?</p> <p>O. What is the regulatory burden to conduct evaluation reports every year? Are there any benefits for BC Hydro to make such evaluations annually, or under a less frequent time interval (e.g. once every two years)?</p> <p>P. Please provide BC Hydro's views if the BCUC's approval of the Freshet Rate application is condition upon BC Hydro submitting annual evaluation reports.</p>



March 2, 2020

Sent via eFile

BCH TRANSMISSION SERVICE MARKET REFERENCE- PRICED RATES	EXHIBIT A-5
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To: British Columbia Hydro and Power Authority
Registered Interveners

**Re: British Columbia Hydro and Power Authority – Transmission Service Market Reference-Priced Rates
Application – Project 1599053 – Streamlined Review Process**

Further to the British Columbia Utilities Commission (BCUC) Order G-327-19, which established a regulatory timetable with respect to the above-noted application, this letter confirms the upcoming Streamlined Review Process (SRP) and provides information about the hearing.

General Information

The SRP will commence at **9:00 a.m. on Tuesday, March 17, 2020 on the 12th Floor, 1125 Howe Street, Vancouver, BC V6Z 2K8**. Parties who wish to participate via video/teleconference must test their connections prior to the commencement of the SRP. Please contact Allwest Reporting Ltd. at 604-683-4774 if you require technical assistance.

As set out in the [SRP Policy, Guidelines and Procedures](#), participation in the SRP includes the applicant, registered interveners, the Panel and BCUC staff. An SRP is designed to combine the essential elements of a workshop, oral hearing, information requests and arguments in one efficient process. While a verbatim transcript of the discussions will be taken by Allwest Reporting Ltd., all parties may participate in the SRP in an informal yet respectful manner.

The Panel provides details regarding the scope and process of the SRP below.

Scope and Process

The scope of the SRP is to address the Freshet Rate component of the Application. Specifically, BC Hydro requests approval of an amended Freshet Rate (Rate Schedule 1892) to be made available on an ongoing basis, commencing April 1, 2020 with no fixed termination date.¹ BC Hydro has indicated that it is proceeding to enroll customers for the 2020 freshet period on the premise that the Panel will grant its approval prior to May 1, 2020.²

Appendix A of this letter includes a list of BCUC scoping questions in advance of the SRP to facilitate an efficient process. Interveners may submit written questions in advance of the SRP by Monday, March 9, 2020. BC Hydro is requested to address the pre-filed questions as part of its presentation. BC Hydro's presentation should not reintroduce details of the Application. Any other questions by the participants can be addressed during the SRP.

¹ Exhibit B-1, pp. 4–5

² Exhibit B-4, BC Hydro response to BCUC IR 1.5.1

The SRP will proceed in the following order:

1. The Panel Chair will make an opening statement and comment on procedural matters for the day.
2. Participants will register their appearances.
3. BC Hydro will provide its presentation on the scoping items set out in Appendix A as well as the interveners' pre-filed questions. The Panel and participants may ask questions of BC Hydro at the conclusion of its presentation. Before asking questions, participants should first identify themselves for the transcription record.
4. In order for BC Hydro to respond to any confidential questions, the Panel may arrange for an in-camera session.
5. After the question period, BC Hydro and interveners will provide oral final and reply arguments, as applicable, regarding the Freshet Rate approval sought in the Application.
6. Participants are invited to make submissions on process and resolution, if the Panel does not reach a decision on the Freshet Rate component of the Application before May 1, 2020.

If you have any questions or concerns about the SRP, please contact Commission Secretary at commission.secretary@bcuc.com, 604-660-4700 or BC Toll Free: 1-800-663-1385.

Sincerely,

Original signed by:

Patrick Wruck
Commission Secretary

LC/jo
Enclosure

British Columbia Hydro and Power Authority
Transmission Service Market Reference-Priced Rates Application

BCUC Pre-filed Questions for Streamlined Review Process

1. To date, how many customers have given notice to BC Hydro to enroll for the 2020 freshet period? How does the 2020 freshet period enrollment compare to the average historical participation?
2. In response to BCUC information request (IR) 1.9.4, BC Hydro provides its rationale for not curtailing customers for economic reasons. How will all other BC Hydro ratepayers be protected in the absence of curtailment for economic reasons? What are the benefits (and to whom would they accrue) if the curtailment criteria include economic reasons?
3. In response to BCUC IR 1.8.2, BC Hydro states that the 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition 1: Minimum Generation with Exports approximately ■ per cent of the time, Condition 2: Minimum Generation with Imports approximately ■ per cent of the time, and Condition 3: Higher Basin Generation on the Margin approximately ■ per cent of the time. What was the split of such conditions during Years 1 to 3 of the Freshet Rate Pilot?
4. Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?
5. In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?
6. In response to BCSEA IR 1.5.2, BC Hydro submits that the subtraction of implementation costs, and verified load shifting costs, from the estimated revenue gains for the entire period of the Freshet Rate Pilot would have provided a more accurate indication of net financial impact. However, BC Hydro does not have verified estimates of load shifting for Year 3 and 4 of the pilot and has not provided actual implementation costs for Year 4. To the extent possible, what is BC Hydro's best estimate of load shifting and implementation costs, and what is the corresponding financial impact for each of Years 3 and 4?
7. Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?
8. In response to MoveUP IR 1.3.1, BC Hydro explains its proposal to not review the Freshet Rate earlier than ten years. How, if at all, will BC Hydro, BCUC and ratepayers ensure that the Freshet Rate remains economical for all ratepayers during this ten year period?

Fred James

Chief Regulatory Officer

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bchydroregulatorygroup@bchydro.com

February 20, 2020

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

Dear Mr. Wruck:

**RE: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application
Responses to BCUC and Interveners Information Request No. 1**

BC Hydro writes in compliance with BCUC Order No. G-327-19 to provide its responses to Round 1 information requests 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

BC Hydro is filing a number of IR responses and/or attachments to responses confidentially with the BCUC. BC Hydro confirms that in each instance, 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 BCUC's Rules of Practice and Procedure.

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

sh/ma

Enclosure

British Columbia Utilities Commission Information Request No. 1.1.1 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 1 of 2
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

1.0 A. GENERAL

Reference: INTRODUCTION
Exhibit B-1, Application, Sections 1.1.3 and 1.1.4, pp. 7 and 10; Appendices B and C
Eligibility

On page 7 of the British Columbia Hydro and Power Authority (BC Hydro) Transmission Service Market Reference-Priced Rates Application (Application), BC Hydro states:

The Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but would be offered on a year-round basis. BC Hydro expects that some customers will prefer the seasonal Freshet Rate, while others will prefer the annual Incremental Energy Rate [IER] Pilot. Having both rates available will provide transmission service customers with choice during the proposed pilot period. It will also permit direct observation of customer preferences and specific actions taken to increase load.

On page 10 of the Application, BC Hydro states:

On September 30, 2019, the BCUC issued Order No. G-236-19 which approved BC Hydro's application to expand the availability of RS 1880 (Standby and Maintenance Supply) to customers taking service under RS 1828 (Biomass Energy Program). In this application, BC Hydro is seeking similar approval for the Freshet Rate (RS 1892) and Incremental Energy Rate Pilot (RS 1893) to be available to customers taking service under RS 1828, in addition to those taking service under RS 1823. The terms and conditions for RS 1823 and RS 1828 are similar and, in BC Hydro's view, customers taking service under RS 1828 should have equal access to the same non-firm service options as customers taking service under RS 1823.

In the proposed tariff pages as outlined in Appendices B and C, BC Hydro indicates that a Customer may only take service under one of Rate Schedule (RS) 1892 or 1893 in any Billing Year. Specific to RS 1892 in Appendix B, the clause "with the exception of the period ending March 31, 2021" was added.

1.1.1 Please explain whether it is possible for a RS 1823 or RS 1828 Customer to have multiple sites. If so, please clarify how will BC Hydro bill a Customer with multiple sites when the Tariff provides that the Customer may only take service under one of the two rate schedules (i.e. Freshet Rate RS 1892 or IER Pilot RS 1893).

British Columbia Utilities Commission Information Request No. 1.1.1 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 2 of 2
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

RESPONSE:

Yes, it is possible for a Customer (such as Canfor or West Fraser, for example) to own and operate multiple sites. However, it is not possible for a unique Customer site to be served (and billed) under RS 1823 and RS 1828 simultaneously.

BC Hydro provides firm transmission voltage service on a Customer site-specific basis under the applicable rate schedule as follows:

- RS 1823 is BC Hydro's default rate for most firm transmission voltage customers; and
- RS 1828 only applies where the transmission voltage Customer site has an Electricity Purchase Agreement (EPA) under BC Hydro's Biomass Energy Program. At present, only two such Customer sites are served under RS 1828.

The Freshet Rate (RS 1892) and the IER Pilot (RS 1893) are optional non-firm services that BC Hydro proposes to make available to all eligible RS 1823 and RS 1828 Customer sites. Per the "Availability" criteria specified in RS 1892 and RS 1893 and described in the preamble, the Customer may only take service under one of these Rate Schedules in any Billing Year.

For billing purposes, each participating Customer site will be billed under the applicable firm service Rate Schedule (whether RS 1823 or RS 1828) for its baseline electricity use and under the applicable non-firm service Rate Schedule (whether RS 1892 or RS 1893) for its incremental energy use.

British Columbia Utilities Commission Information Request No. 1.1.2 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 1 of 2
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

1.0 A. GENERAL

Reference: INTRODUCTION
Exhibit B-1, Application, Sections 1.1.3 and 1.1.4, pp. 7 and 10; Appendices B and C
Eligibility

On page 7 of the British Columbia Hydro and Power Authority (BC Hydro) Transmission Service Market Reference-Priced Rates Application (Application), BC Hydro states:

The Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but would be offered on a year-round basis. BC Hydro expects that some customers will prefer the seasonal Freshet Rate, while others will prefer the annual Incremental Energy Rate [IER] Pilot. Having both rates available will provide transmission service customers with choice during the proposed pilot period. It will also permit direct observation of customer preferences and specific actions taken to increase load.

On page 10 of the Application, BC Hydro states:

On September 30, 2019, the BCUC issued Order No. G-236-19 which approved BC Hydro's application to expand the availability of RS 1880 (Standby and Maintenance Supply) to customers taking service under RS 1828 (Biomass Energy Program). In this application, BC Hydro is seeking similar approval for the Freshet Rate (RS 1892) and Incremental Energy Rate Pilot (RS 1893) to be available to customers taking service under RS 1828, in addition to those taking service under RS 1823. The terms and conditions for RS 1823 and RS 1828 are similar and, in BC Hydro's view, customers taking service under RS 1828 should have equal access to the same non-firm service options as customers taking service under RS 1823.

In the proposed tariff pages as outlined in Appendices B and C, BC Hydro indicates that a Customer may only take service under one of Rate Schedule (RS) 1892 or 1893 in any Billing Year. Specific to RS 1892 in Appendix B, the clause "with the exception of the period ending March 31, 2021" was added.

1.1.2 Please clarify what BC Hydro means by "with the exception of the period ending March 31, 2021" with respect to the proposed Freshet Rate RS 1892.

British Columbia Utilities Commission Information Request No. 1.1.2 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 2 of 2
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

RESPONSE:

BC Hydro intends that a Customer may only take service under RS 1892 or RS 1893 in any Billing Year.

The reason that BC Hydro added “*with the exception of the period ending March 31, 2021*” to the availability provision of RS 1892 was to address the uncertainty as to if and when the BCUC might approve BC Hydro’s proposals for RS 1892 and RS 1893.

BC Hydro’s expectation is that the BCUC’s decision on these rate proposals would be provided during fiscal 2021. Accordingly, BC Hydro sought to ensure that a customer who might elect to participate in RS 1892 for the May to July period of 2020 would not be prohibited from also participating in RS 1893 for the balance of the fiscal 2021 period between August 2020 and March 2021.

Both RS 1892 and RS 1893 require the customer to provide their notice of participation for one rate schedule or the other by March 1st. The implication of the March 1st sign-up date is that the customer must choose to participate in one of the rates by that date and could not transfer to the other rate schedule during the same Billing Year absent the proposed language “... with the exception of the period ending March 31, 2021.”

Subsequently, if both rate schedules are available, customers can choose to participate in one rate or the other in a future Billing Year by March 1st.

British Columbia Utilities Commission Information Request No. 1.1.3 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 1 of 2
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

1.0 A. GENERAL

Reference: INTRODUCTION
Exhibit B-1, Application, Sections 1.1.3 and 1.1.4, pp. 7 and 10; Appendices B and C
Eligibility

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The Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but would be offered on a year-round basis. BC Hydro expects that some customers will prefer the seasonal Freshet Rate, while others will prefer the annual Incremental Energy Rate [IER] Pilot. Having both rates available will provide transmission service customers with choice during the proposed pilot period. It will also permit direct observation of customer preferences and specific actions taken to increase load.

On page 10 of the Application, BC Hydro states:

On September 30, 2019, the BCUC issued Order No. G-236-19 which approved BC Hydro's application to expand the availability of RS 1880 (Standby and Maintenance Supply) to customers taking service under RS 1828 (Biomass Energy Program). In this application, BC Hydro is seeking similar approval for the Freshet Rate (RS 1892) and Incremental Energy Rate Pilot (RS 1893) to be available to customers taking service under RS 1828, in addition to those taking service under RS 1823. The terms and conditions for RS 1823 and RS 1828 are similar and, in BC Hydro's view, customers taking service under RS 1828 should have equal access to the same non-firm service options as customers taking service under RS 1823.

In the proposed tariff pages as outlined in Appendices B and C, BC Hydro indicates that a Customer may only take service under one of Rate Schedule (RS) 1892 or 1893 in any Billing Year. Specific to RS 1892 in Appendix B, the clause "with the exception of the period ending March 31, 2021" was added.

1.1.3 Please explain why the proposed Freshet Rate and IER Pilot are only offered to transmission service rate customers under RS 1823 and 1828. Has BC Hydro considered making the same offerings available to other transmission service rate customer rate schedules (e.g. RS 1825, 1827, 1852, etc.)? Why or why not?

British Columbia Utilities Commission Information Request No. 1.1.3 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 2 of 2
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

RESPONSE:

RS 1823 and RS 1828 customers represent all but five transmission service load customers served under firm transmission voltage rate schedules. RS 1823 and RS 1828 customers have control over their electricity use, such that they have the ability to increase electricity use under the proposed Freshet Rate and IER Pilot.

BC Hydro considers that it is not appropriate to make these same offerings available to customers served under other firm transmission service rates for the following reasons:

- **No customer is presently served under RS 1825. No customer has requested service under RS 1825 since the rate was introduced in April 2006;**
- **Four customers are exempted from default service under RS 1823 with the approval of the BCUC and served under RS 1827. One customer is served under RS 3808. These customers are either a public utility, or have made representations to the BCUC that they operate like a public utility and should be exempted from RS 1823 as they do not control electricity use by the customers they serve; and**
- **RS 1852 service (Modified Transmission Demand) is only available for a customer already taking service under RS 1823 – it is not a firm service alternative.**

British Columbia Utilities Commission Information Request No. 1.2.1 Dated: January 23, 2020 British Columbia Hydro & Power Authority Response issued February 20, 2020	Page 1 of 1
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2.0 A. GENERAL

**Reference: AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY RATE PILOT RS 1893
 Exhibit B-1, Appendices B and C
 Rate Schedule Comparison**

On page 1 of Appendix B to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1892 during each HLH [High Load Hours] and LLH [Low Load Hours] of the current Freshet Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour; and
 - (b) \$0/kWh; plus
- An \$3.00/MWh adder.

On page 1 of Appendix C to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1893 during each HLH and LLH in the Billing Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour on each day of the Billing Period; and
 - (b) \$0/kWh; plus
- An adder of \$3.00/MWh for the May, June and July Billing Periods and \$7.00/MWh for all other Billing Periods.

1.2.1 Please confirm, or explain otherwise, that the proposed rates charged under each of RS 1892 and RS 1893 are the same during the May, June and July Billing Periods.

RESPONSE:

BC Hydro confirms that the charges (Mid-C index price plus adder) under both rate schedules are the same in each of the May, June and July Billing Periods.

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2.0 A. GENERAL

**Reference: AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY RATE PILOT RS 1893
 Exhibit B-1, Appendices B and C
 Rate Schedule Comparison**

On page 1 of Appendix B to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1892 during each HLH [High Load Hours] and LLH [Low Load Hours] of the current Freshet Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour; and
 - (b) \$0/kWh; plus
- An \$3.00/MWh adder.

On page 1 of Appendix C to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1893 during each HLH and LLH in the Billing Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour on each day of the Billing Period; and
 - (b) \$0/kWh; plus
- An adder of \$3.00/MWh for the May, June and July Billing Periods and \$7.00/MWh for all other Billing Periods.

1.2.1 Please confirm, or explain otherwise, that the proposed rates charged under each of RS 1892 and RS 1893 are the same during the May, June and July Billing Periods.

1.2.1.1 If confirmed, please explain why. Does BC Hydro expect that a customer would choose RS 1893 over RS 1892 because the rates under RS 1893 are the same as RS 1892 during freshet months and in addition RS 1893 provides the option of accessing market energy during non-freshet months?

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RESPONSE:

Customers provided feedback to BC Hydro that their decision to participate in either RS 1892 or RS 1893 would be impacted by factors that include:

- The ability to increase load over three months rather than over 12 months, including the resources required to manage site operations for incremental load based on daily price signals;
- The capability of their site operation to manage the prospective risk of interruption and market price exposure over three months rather than over twelve months; and
- The use of seasonal baselines (three in total) with seasonal billing settlement under RS 1892 as opposed to monthly baselines (36 in total) and monthly billing settlement under RS 1893.

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2.0 A. GENERAL

Reference: AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY RATE PILOT RS 1893
Exhibit B-1, Appendices B and C
Rate Schedule Comparison

On page 1 of Appendix B to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1892 during each HLH [High Load Hours] and LLH [Low Load Hours] of the current Freshet Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour; and
 - (b) \$0/kWh; plus
- An \$3.00/MWh adder.

On page 1 of Appendix C to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1893 during each HLH and LLH in the Billing Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour on each day of the Billing Period; and
 - (b) \$0/kWh; plus
- An adder of \$3.00/MWh for the May, June and July Billing Periods and \$7.00/MWh for all other Billing Periods.

1.2.1 Please confirm, or explain otherwise, that the proposed rates charged under each of RS 1892 and RS 1893 are the same during the May, June and July Billing Periods.

1.2.1.2 To the extent that there is a competitive rate signal between RS 1892 and RS 1893, please discuss the implications to BC Hydro's forecast revenues in these rate schedules.

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RESPONSE:

As described in BC Hydro's response to BCUC IR 1.2.1, the proposed charges under each of RS 1892 and RS 1893 are the same during the May to July Billing Periods.

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2.0 A. GENERAL

Reference: AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY RATE PILOT RS 1893
Exhibit B-1, Appendices B and C
Rate Schedule Comparison

On page 1 of Appendix B to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1892 during each HLH [High Load Hours] and LLH [Low Load Hours] of the current Freshet Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour; and
 - (b) \$0/kWh; plus
- An \$3.00/MWh adder.

On page 1 of Appendix C to the Application, BC Hydro states:

The charge applied to energy supplied under this Rate Schedule 1893 during each HLH and LLH in the Billing Period is equal to:

- The greater of
 - (a) The Intercontinental Exchange (**ICE**) Mid-Columbia (**Mid-C**) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour on each day of the Billing Period; and
 - (b) \$0/kWh; plus
- An adder of \$3.00/MWh for the May, June and July Billing Periods and \$7.00/MWh for all other Billing Periods.

1.2.2 Please explain under what circumstance an eligible transmission service customer would choose RS 1892 over RS 1893.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.1.1.

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3.0 A. GENERAL

Reference: **IMPLEMENTATION COSTS**
Exhibit B-1, Appendix D, p. 35
Pilot Program Costs by Year and Type

In Table 10 on page 35 of Appendix D to the Application, BC Hydro provides a breakdown of implementation costs associated with the Freshet Rate Pilot, from years 1 through 3.

Table 10 Pilot Implementation Costs by Year

Implementation Cost Description	Year 1	Year 2	Year 3	Totals
Freshet rate design / regulatory proceedings	\$ 40,000	\$ -	\$ -	\$ 40,000
Customer and stakeholder engagement	\$ 30,000	\$ 15,000	\$20,000	\$ 65,000
Billing	\$ 20,000	\$ 10,000	\$30,000	\$ 60,000
Evaluation report preparation	\$ 25,000	\$ 5,000	\$10,000	\$ 40,000
Total	\$ 115,000	\$ 30,000	\$60,000	\$ 205,000

1.3.1 Please include the pilot implementation costs for Year 4 of the Freshet Rate Pilot.

RESPONSE:

Implementation costs for Year 4 of the Freshet Rate Pilot were estimated at \$50,000. Please refer to section 1.8.2 of Appendix E to the Application. All other staff and administration costs were funded under existing operating budgets.

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3.0 A. GENERAL

Reference: **IMPLEMENTATION COSTS**
Exhibit B-1, Appendix D, p. 35
Pilot Program Costs by Year and Type

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Table 10 Pilot Implementation Costs by Year

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Evaluation report preparation	\$ 25,000	\$ 5,000	\$10,000	\$ 40,000
Total	\$ 115,000	\$ 30,000	\$60,000	\$ 205,000

1.3.2 Please provide an annual breakdown of implementation costs for the IER Pilot, similar in form to Table 10 as provided in the preamble.

RESPONSE:

BC Hydro's estimated implementation costs for the RS 1893 Pilot are shown in the table below. The costs in the table do not include any costs associated with a potential regulatory proceeding in regards to the final evaluation report.

Estimated Implementation Costs for RS 1893 Pilot	Year 1 (F20-21)	Year 2 (F22)	Year 3 (F23)	Year 4 (F24)	Totals
RS 1893 rate design and regulatory approval	\$ 66,000	\$ -	\$ -	\$ -	\$ 66,000
Customer and stakeholder engagement	\$ 15,000	\$ 10,000	\$ 10,000	\$ 30,000	\$ 65,000
Billing	\$ 105,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 120,000
Evaluation report preparation	\$ -	\$ -	\$ -	\$ 30,000	\$ 30,000
Total	\$ 186,000	\$ 15,000	\$ 15,000	\$ 65,000	\$ 281,000

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4.0 A. GENERAL

Reference: **AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY RATE PILOT RS 1893**
Exhibit B-1, Appendices B and C
Baseline Disputes

In the proposed Tariff pages under Special Conditions of the Freshet Rate and IER Pilot, there are provisions for which the British Columbia Utilities Commission (BCUC) will determine the baselines and reference demands if BC Hydro and the Customer depart from the Tariff or if the two parties cannot reach an agreement.

1.4.1 Please explain what process BC Hydro anticipates for the BCUC to review and determine the appropriate baseline or reference demand.

RESPONSE:

BC Hydro expects a similar review process that the BCUC has used to approve Baselines and Reference Demands for the Freshet Rate Pilot. For example, refer to BCUC Order No. G-94-18 dated May 17, 2018, regarding BC Hydro's Rate Schedule 1892 Transmission Service Freshet Energy Baseline Application.

In this process BC Hydro submits an application to the BCUC describing and requesting approval of the proposed Baselines and Reference Demands. The application includes a summary of BC Hydro's determination in accordance with RS 1892 and a copy of the proposed baselines that were agreed to by the customer.

BC Hydro believes this process is efficient and sufficient for the review of Baselines and Reference Demands baselines for the Incremental Energy Rate Pilot.

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4.0 A. GENERAL

Reference: AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY RATE PILOT RS 1893
Exhibit B-1, Appendices B and C
Baseline Disputes

In the proposed Tariff pages under Special Conditions of the Freshet Rate and IER Pilot, there are provisions for which the British Columbia Utilities Commission (BCUC) will determine the baselines and reference demands if BC Hydro and the Customer depart from the Tariff or if the two parties cannot reach an agreement.

1.4.2 Please identify whether there have been cases where BC Hydro and the Customer cannot reach an agreement on the baseline or reference demand during the Freshet Rate Pilot. Describe the resolution process between BC Hydro and the Customer.

RESPONSE:

There have been no cases where BC Hydro and the Customer could not reach agreement on alternative electricity baselines pursuant to Special Condition No. 4 of RS 1892. The process used for review and determination of the agreed-to baselines between BC Hydro and the Customer is described in the following applications to the BCUC:

- **Rate Schedule (RS) 1892 Transmission Service Freshet Energy Baseline Application (2018), approved by BCUC Order No. G-94-18 on May 17, 2018;**
- **Rate Schedule (RS) 1892 – Transmission Service Freshet Energy Baselines Application (2017), approved by BCUC Order No. G-77-17 on May 18, 2017; and**
- **Rate Schedule (RS) 1892 – Transmission Service Freshet Energy Baselines Application (2016), approved by BCUC Order No. G-76-16 on May 27, 2016.**

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4.0 A. GENERAL

**Reference: AMENDED FRESHET RS 1892 AND INCREMENTAL ENERGY
 RATE PILOT RS 1893
 Exhibit B-1, Appendices B and C
 Baseline Disputes**

In the proposed Tariff pages under Special Conditions of the Freshet Rate and IER Pilot, there are provisions for which the British Columbia Utilities Commission (BCUC) will determine the baselines and reference demands if BC Hydro and the Customer depart from the Tariff or if the two parties cannot reach an agreement.

1.4.3 Please specify whether BC Hydro has sought BCUC review and approval of any baselines or reference demands related to the Freshet Rate Pilot.

RESPONSE:

BC Hydro sought BCUC review and approval of baselines or reference demands related to the Freshet Rate Pilot in 2016, 2017 and 2018. These baselines and reference demands were approved by BCUC Order Nos. G-76-16, G-77-17 and G-94-18.

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5.0 B. FRESHET RATE PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, Section 1.1.2, p. 4
Freshet Rate Timeline

The Freshet Rate pilot is an optional rate for non-firm, interruptible electricity service above normal RS 1823 baseline amounts during a historical freshet period commencing May 1 and ending July 31. The Freshet Rate terminated on December 31, 2019.

BC Hydro is applying for approval of an amended Freshet Rate – Rate Schedule 1892 (RS 1892) effective April 1, 2020 on an ongoing basis. BC Hydro proposes a decision on the Freshet Energy Rate by February 28, 2020. The BCUC established a regulatory timetable by Order G-327-19.

1.5.1 Please discuss BC Hydro's plan to enroll customers for the 2020 Freshet period commencing on May 1, 2020 in light of the established regulatory timetable.

RESPONSE:

BC Hydro is proceeding to enroll customers for the 2020 freshet period on the premise that an Order to approve the rate will be provided by the BCUC prior to May 1, 2020.

BC Hydro has requested that customers provide written notice of their intent to participate in the 2020 freshet period by March 1, 2020, pursuant to the proposed Special Condition No. 2 of RS 1892. An email to this effect, with detailed instructions, was sent by BC Hydro to all eligible RS 1823 and RS 1828 customers on February 3, 2020.

BC Hydro confirms that customers understand that their notice of intent to participate in RS 1892 for the 2020 freshet period is only valid if the rate is approved by the BCUC.

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6.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
 Exhibit B-1, Section 4.1.1, p. 46
 Impact of Variability of Water Flows**

On page 46 of the Application, BC Hydro states "BC Hydro notes that there can be significant variability in system water inflows, in the range of +/- 7,000 GWh/yr. During high inflow years the freshet period energy surplus will be higher and during low inflow years, the freshet period energy surplus will be lower."

1.6.1 Please list the hydro plants and reservoirs contributing to the energy used to serve the Freshet Rate Pilot.

RESPONSE:

BC Hydro operates its system of resources as an integrated portfolio to serve the domestic load and provide marketing opportunities for electricity trade. As such, we are unable to specifically attribute the contribution of any particular hydro plants, reservoirs, or EPA resources to serving the RS 1892 or RS 1893.

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6.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 4.1.1, p. 46
Impact of Variability of Water Flows**

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1.6.2 Please provide water inflow levels (e.g. GWh/yr and in meters), for the past 5-years, for each of the reservoirs contributing to the Freshet Rate Pilot.

RESPONSE:

All assets that are generating during the freshet are contributing to periods of freshet oversupply. This includes dispatchable and non-dispatchable heritage assets owned by BC Hydro, and Independent Power Producers.

Below are the May to July inflows into BC Hydro's heritage assets.

Year	May to July BC Hydro Inflows (GWh)
2015	██████
2016	██████
2017	██████
2018	██████
2019	██████

BC Hydro operates the generation assets as a portfolio, as a result the inflow numbers cannot be translated into meters as the energy per meter conversion varies by asset and by the reservoir elevation of that asset.

BC Hydro does not disclose system inflow information for our reservoirs as those values provide information on the price that BC Hydro is likely willing to transact with Powerex Corp. Disclosure of the information may have impacts on BC Hydro's potential transactions with Powerex. Accordingly, BC Hydro has redacted this information in the public version of this IR response and requests that the BCUC treat it as confidential.

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6.0 B. FRESHET RATE PROPOSAL

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1.6.3 Please explain whether BC Hydro assesses an optimal water inflow level required to serve RS 1892 incremental load. If so, how does BC Hydro arrive at the estimate and what were they for each year of the Freshet Rate Pilot? If not, please explain the limitation of conducting such assessment.

RESPONSE:

BC Hydro interprets this question to ask whether there is a minimum amount of inflow during the freshet period that would ensure ratepayers are not negatively impacted by the proposed RS 1892. BC Hydro has not computed such an inflow.

The intent of RS 1892 is to ameliorate the expected oversupply of energy during the freshet period. This oversupply is the result of system minimum energy during the freshet period, which includes inflows and must-take energy from Independent Power Producers.

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6.0 B. FRESHET RATE PROPOSAL

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1.6.3 Please explain whether BC Hydro assesses an optimal water inflow level required to serve RS 1892 incremental load. If so, how does BC Hydro arrive at the estimate and what were they for each year of the Freshet Rate Pilot? If not, please explain the limitation of conducting such assessment.

1.6.3.1 If applicable, please show how the historical water inflow levels compare to the optimal water inflow levels required to serve the RS 1892 incremental load.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.3.

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6.0 B. FRESHET RATE PROPOSAL

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1.6.3 Please explain whether BC Hydro assesses an optimal water inflow level required to serve RS 1892 incremental load. If so, how does BC Hydro arrive at the estimate and what were they for each year of the Freshet Rate Pilot? If not, please explain the limitation of conducting such assessment.

1.6.3.2 If applicable, please discuss any water inflow trends, identified in the past 5 years, that may have negatively impacted the Freshet Rate Pilot.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.3 for a review of the inflow during the four years of the Freshet Rate Pilot. An analysis of fiscal 2015 has not been prepared.

Over the four years of the Freshet Rate Pilot, fiscal 2019 was the only year when the combination of market prices, inflows and reservoir elevations resulted in a revenue loss of \$0.5 million. Please also refer to Appendix E of the Application for the 2019 evaluation.

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7.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
 Exhibit B-1, Section 5.5.1, pp. 72–73; Appendix D, Freshet
 Rate Pilot Final Evaluation Report – December 2018
 Economic Justification and Ratepayer Impacts**

On pages 72–73 of the Application, BC Hydro states:

BC Hydro uses energy study models designed to optimize BC Hydro's system operations through representation of the components of BC Hydro's load, transmission network, generating system, EPAs and external markets. The models incorporate market prices, inflows and weather conditions for each day of each forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro uses these models to determine an optimal set of reservoir and generating station operations and market transactions, based on current forecast information.

In BC Hydro's consultations, climate change was identified as a potential factor impacting the Freshet Rate Pilot. In the December 2018 consultation report, regarding the question as to whether the Freshet Rate Pilot should be made permanent, the following comment was noted, "Define permanent. With climate change we may not have a benefit of over storage or markets could react negatively (re: price)."

1.7.1 Please provide BC Hydro's revenue forecast and ratepayer impact of the Freshet Rate over the next 3 years, similar to that provided for the IER pilot.

RESPONSE:

BC Hydro has assessed the results for expected RS 1892 net revenue (excluding implementation costs and load shifting impacts) over the freshet periods of 2020, 2021 and 2022 as shown below. BC Hydro used the same approach and inputs as for the IER Pilot and incorporated the following RS 1892 participation and load assumptions:

- **The number of future RS 1892 customer participants will be approximately 50 per cent lower than the number of historical RS 1892 participants due to forestry sector plant shutdowns and certain customers electing to take RS 1893 service rather than RS 1892 service;**

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- **Maximum incremental load demand, in aggregate, across RS 1892 participant customers for the freshet period on any given day is an average of 30 MW over each hour; and**
- **CAD \$55/MWh all-in customer strike price for incremental load was used (being the average RS 1892 price at which BC Hydro expects the customer would reduce incremental load to baseline).**

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	71	kCAD
10th Percentile Net Revenue	-314	kCAD
50th Percentile Net Revenue	81	kCAD
90th Percentile Net Revenue	436	kCAD
Expected Incremental Load	64	GWh
10th Percentile Incremental Load	60	GWh
50th Percentile Incremental Load	65	GWh
90th Percentile Incremental Load	66	GWh

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7.0 B. FRESHET RATE PROPOSAL

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In BC Hydro's consultations, climate change was identified as a potential factor impacting the Freshet Rate Pilot. In the December 2018 consultation report, regarding the question as to whether the Freshet Rate Pilot should be made permanent, the following comment was noted, "Define permanent. With climate change we may not have a benefit of over storage or markets could react negatively (re: price)."

1.7.2 Please provide analysis showing how forecast revenues and ratepayer impact of the Freshet Rate are expected to vary with a change in freshet period inflows. Provide high, low, and average inflow scenarios to show a sensitivity analysis.

RESPONSE:

BC Hydro cannot provide the requested forecast as it has not completed the analysis. However, the four-year trial period covered various inflow conditions. Please also refer to BC Hydro's response to BCOAPO IR 1.9.5 for description of the marginal resource condition during the four-year pilot period.

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7.0 B. FRESHET RATE PROPOSAL

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Economic Justification and Ratepayer Impacts**

On pages 72–73 of the Application, BC Hydro states:

BC Hydro uses energy study models designed to optimize BC Hydro's system operations through representation of the components of BC Hydro's load, transmission network, generating system, EPAs and external markets. The models incorporate market prices, inflows and weather conditions for each day of each forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro uses these models to determine an optimal set of reservoir and generating station operations and market transactions, based on current forecast information.

In BC Hydro's consultations, climate change was identified as a potential factor impacting the Freshet Rate Pilot. In the December 2018 consultation report, regarding the question as to whether the Freshet Rate Pilot should be made permanent, the following comment was noted, "Define permanent. With climate change we may not have a benefit of over storage or markets could react negatively (re: price)."

1.7.3 Please provide a forecast of expected reservoir inflows over the next 3 years. State all input data used and assumptions.

RESPONSE:

The table below presents annual expected inflows into BC Hydro assets, which are calculated as the average of 46 separate weather sequences.

Year	Forecast System Inflow (GWh)
Fiscal 2021	██████
Fiscal 2022	██████
Fiscal 2023	██████

As of October 2019, historic inflow data exists for the period 1973 through 2018. These 46 years of inflows provide the basis for an ensemble of inflow forecasts in cubic meters per second. These inflows are converted to energy using the suite of Energy Studies models.

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BC Hydro does not disclose forecast system inflow information for our reservoirs as those values provide information on the price that BC Hydro is likely willing to transact with Powerex Corp. Disclosure of the information may have impacts on BC Hydro's potential transactions with Powerex. Accordingly, BC Hydro has redacted this information in the public version of this IR response and requests that the BCUC treat it as confidential.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

7.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
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1.7.3 Please provide a forecast of expected reservoir inflows over the next 3 years. State all input data used and assumptions.

1.7.3.1 Please discuss how BC Hydro determines a "set of historical weather scenarios" used to prepare BC Hydro's forecasts. What input data (i.e. actual precipitation data) were used in the scenarios?

RESPONSE:

Please refer to Attachment 1, which contains BC Hydro's response to BCUC IR 1.31.1 as submitted in BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application Proceeding.

British Columbia Utilities Commission Information Request No. 1.31.1 Dated: April 23, 2019 British Columbia Hydro & Power Authority Response issued June 6, 2019	Page 1 of 4
British Columbia Hydro & Power Authority Fiscal 2020 to Fiscal 2021 Revenue Requirements Application	Exhibit: B-5

31.0 D. CHAPTER 4 – COST OF ENERGY

Reference: COST OF ENERGY
Exhibit B-1, Appendix DD, pp. 9, 13
Monthly energy studies – Backtesting

BC Hydro states on page 9 of Appendix DD to the Application that “[m]ost of the 85 models involved in the Energy Studies process are documented in the Model inventory, and have been assigned a primary and a secondary owner.”

On page 13 of Appendix DD, BC Hydro states that “[n]o regular back testing (or benchmarking) is performed in the current process.”

1.31.1 Please explain whether a range of inputs are used in the 85 models. If yes, please elaborate on how the range of values is determined and explain the methodology on how the range of inputs to the 85 models are compiled to produce the single values reported for each of the Cost of Energy components.

RESPONSE:

There are many dependencies between models within the Energy Studies process, where the outputs from one are used as the inputs for another. Most models take inputs in ensemble form and produce an ensemble of results, corresponding to 45 different weather years (1973-2017).

Please see the Hydrology section below for details on the implementation of the ensemble of weather years.

The use of these weather year ensembles ensures that the variability in inflows, prices, loads, and resources due to the impacts of weather are well represented in the models, producing a range of possible outcomes. This range captures both dry and wet periods and accurately represents the historic geographic correlation in weather between the regions included in the modeling. This range is large enough that BC Hydro considers the average of the resulting forecast to be an unbiased estimator of the drivers, and hence how the system will be operated.

Incorporation of Variability in Hydrology

Hydrology, such as the inflows to each reservoir, is the largest driver of uncertainty in the Energy Studies. The inflows are a result of rainfall, and snow pack and glacier melt. Once the annually variable snowpack has melted (usually

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towards the end of summer), rainfall becomes the primary driver of reservoir inflows.

Seasonal inflow forecasts are made at the beginning of every month for each of 25 BC Hydro basins. These forecasts are in ensemble form, with one ensemble member for each historic weather sequence. In the Energy Study, forecast inflows are used for the Peace, Columbia, Kootenay and Pend-d'Oreille basins.

As of 2018, historic weather and inflow data exists for the period 1973 through 2017. These 45 years provide the basis for the ensemble set. The Energy Study models require 5 years of inflow data. As a result, a set of parallel sequences is created from the data that preserves any year-over-year correlation, as follows:

- January 1973 to December 1977
- January 1974 to December 1978
- January 2014 to December 1973
- January 2017 to December 1976

Note that to ensure a continuous sequence of five years in all ensembles, the initial year (1973) is assumed to follow the last year (in this case, 2017). This same set of 45 weather year ensembles was used in all key model inputs. 2018 historic data is now available, and in January 2019 the number of ensembles increased to 46 with the addition of the 2018 data.

Within the Energy Studies the use of these weather year ensembles ensures that variability in inflows, prices, loads, and resources due to the impacts of weather are well represented in the models, producing a range of possible outcomes.

For the small plants that are not explicitly modelled, historic generation is used with adjustments for upgrades, outages, or restrictions.

Incorporation of Variability in Markets:

The Energy Studies market model uses historic variability in the price of natural gas at Henry Hub to produce a forecast of gas price variability. This variability flows through to variability in Sumas gas and Mid-C electricity market prices. The Henry Hub gas prices are assumed to be uncorrelated with weather, but weather drivers do have some impact on the Sumas gas and Mid-C electricity forecasts.

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Incorporation into Energy Studies:

The sources of uncertainty listed above are addressed in the Energy Study by using modeling techniques that are tailored to explicitly represent these uncertainties in the economic optimization process, and produce a distribution of outcomes in the form of an ensemble of forecasts.

The 45 possible weather sequences were used as an input into the October 2018 Energy Studies, along with the starting elevation of each reservoir as of October 1, 2018.

The monthly Energy Studies models are proprietary decision support software developed in-house specifically to represent the characteristics of the BC Hydro system and adjacent energy markets. The suite of models forecasts, over a five-year time horizon, an optimal set of reservoir and generating station operations and import/export activity.

BC Hydro uses historic storage levels as a benchmark when ranking the current or forecasted storage. Historic storage levels are not used in the forecasting of future storage levels.

Primary System Operation Risks to Cost of Energy:

From an energy perspective, the primary system operation risks are not having enough water and having to import energy when prices are high, and having too much water and having to spill water and export energy when prices are low. Both of these risks can affect the cost of energy, and the Energy Studies is the primary tool used to assess the potential financial and system operating risks.

Dry Period Risks:

Some of the scenarios examined will have combinations of higher winter loads, lower winter inflows, and lower delivery from BC Hydro small hydro facilities and independent power producers. These scenarios may forecast a draft of system storage, increased imports, and the operation of Island Generation to manage system storage.

Scenarios that result in exceptional drafts of storage are examined to ensure that load requirements can be met.

Wet Period Risks:

BC Hydro reviews the results of the Energy Studies to manage the risk of spill in wet/warm sequences.

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Results for the Test Period:

The values reported under the Heritage Energy section (lines 1-3) and Market Energy section (lines 8-10) of Schedule 4 of Appendix A of the Application are derived from the October 2018 Energy Study. The Energy Study calculates these values with a monthly granularity for an ensemble of weather years. The average of the ensemble is used as the basis for the fiscal year forecasts.

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7.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
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1.7.4 Please confirm if BC Hydro has prepared a forecast of reservoir inflows for the 2020 freshet period based on forecast 2020 weather data and actual precipitation to-date.

RESPONSE:

BC Hydro updates the forecast of reservoir inflows every month as part of the Energy Studies using actual precipitation to date and using the weather ensembles explained in BC Hydro's response to BCUC IR 1.7.3.1.

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1.7.4 Please confirm if BC Hydro has prepared a forecast of reservoir inflows for the 2020 freshet period based on forecast 2020 weather data and actual precipitation to-date.

1.7.4.1 If confirmed, please explain how the forecast inflows from 2019–20 weather data compare to the expected inflows from BC Hydro's set of historical weather scenarios.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.7.3.1.

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1.7.5 Please explain whether BC Hydro has considered climate change (e.g. change in temperature, precipitation levels, rate of snow melt, etc.) when forecasting water inflows and to determine the optimal set of reservoir levels. If so, please specify how these factors are included in BC Hydro's forecasts. If not, please explain why such factors are not considered.

RESPONSE:

The requested information is provided in Attachment 1 to this response, which contains BC Hydro's response to CEC IR 1.17.1 from BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application.

Commercial Energy Consumers Association of British Columbia Information Request No. 1.17.1 Dated: May 2, 2019 British Columbia Hydro & Power Authority Response issued June 6, 2019	Page 1 of 1
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17.0 Reference: Exhibit B-1, page 4-15

System, market and weather conditions can significantly affect market prices.
 Large snowpack, windy and wet conditions act to depress the Mid-C electricity price, while hot, dry summer or cold winter conditions act to raise Mid-C prices.

1.17.1 How does BC Hydro account for climate change related weather conditions in assessing its cost of energy and market prices for energy, if at all?

RESPONSE:

BC Hydro accounts for weather variability in assessing the cost of energy for the three main drivers as described in BC Hydro's response to BCUC IR 1.31.1. BC Hydro's assessment includes:

- Weather variability affecting inflow;
- Weather variability affecting load; and
- Weather variability affecting markets.

Each year, the most recent year of historic data is added to the modeled weather sequences, so that the range adjusts over time and always includes the most recent data. This is based on the assumption that the variability in the historic record is an order of magnitude larger than the impact of any climate change on the mean forecast for the test period. This also means that impacts of climate change are implicitly included in the forecast.

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8.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 4.1, p. 45, Appendix E, pp. 13–19
Evaluation Report for Year Four**

On page 45 of the Application, BC Hydro states:

BC Hydro has identified that Year 4 of the Freshet Rate pilot represented a substantial change in conditions compared to Years 1 to 3. As described in the 2019 Evaluation Report for Year 4 contained in **Appendix E**, conditions during the May to July 2019 freshet period were characterized by a electricity supply issue as a result of the Enbridge gas pipeline issue and low reservoir inflows. This reduced the freshet energy surplus and contributed to higher system marginal prices and higher market energy imports. These conditions resulted in a revenue loss of \$0.5 million for 2019. This compares to revenue gains of \$2.3 million in 2016, \$2.2 million in 2017 and \$1.9 million in 2018.

... Although there is a risk of loss to ratepayers in any given year if adverse conditions arise, the rate design is expected to provide net benefits to ratepayers over a multiyear time period.

On page 19 of Appendix E, BC Hydro states:

Across the winter of 2018/2019, low winter inflows into the BC Hydro system in combination with the Enbridge Gas Pipeline explosion (that impacted thermal generation) resulted in strong downward pressure on system storage. Williston and Kinbasket Reservoirs both approached record minimum storage levels.

Further on page 16 of Appendix E of the Application, BC Hydro provides the following table:

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Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 45	\$ (107)	\$ (275)	\$ (337)
June	\$ 65	\$ (91)	\$ (55)	\$ (81)
July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

- 1.8.1 Please clarify what is meant by “revenue gain” and “revenue loss”. How will revenue gains and losses affect ratepayers enrolled in the Freshet Rate and all other BC Hydro ratepayers? In other words, who will benefit from revenue gains and who will bear revenue losses resulting from the Freshet Rate?

RESPONSE:

The revenue gains and losses referred to are impacts to all ratepayers. Directionally, revenue gains have the effect of reducing BC Hydro’s overall revenue requirements (to the benefit of ratepayers), while losses have the effect of increasing BC Hydro’s overall revenue requirements (to the detriment of ratepayers).

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

8.0 B. FRESHET RATE PROPOSAL

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-4

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

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May	\$ 61	\$ (6)	\$ 481	\$ 536
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	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

1.8.2 Please provide a detailed explanation on the revenue loss to BC Hydro in Year 4 of the Freshet Rate Pilot. In your response, please include all calculations to support the \$543,000 revenue loss.

RESPONSE:

The 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition No. 1 approximately [REDACTED] per cent of the time, Condition No. 2 approximately [REDACTED] per cent of the time, and Condition No. 3 approximately [REDACTED] per cent of the time.

BC Hydro estimates that, as a result of periods under Condition No. 2, BC Hydro imported approximately [REDACTED] GWh, which represents [REDACTED] per cent of the total 2019 RS 1892 load of 111 GWh.

BC Hydro provides as Confidential Attachment 1 to this IR a spreadsheet containing a detailed breakdown for each day by HLH and LLH block. The attachment follows the same format as the examples in the attachments to

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BC Hydro's response to BCUC IRs 1.20.1 and 1.20.2. BC Hydro requests confidential treatment of this attachment as it contains day ahead Mid-C ICE pricing, which has been provided by ICE to BC Hydro subject to confidentiality terms. BC Hydro only has permission to share this data confidentially with the Commission.

BC Hydro also provides as Public Attachment 1 to this IR, a redacted version of this spreadsheet, which excludes day ahead Mid-C ICE pricing.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

1.8.3 Please explain the direct effect of the Enbridge pipeline rupture on BC Hydro's electricity supply and how this contributed to a negative net revenue in Year 4.

RESPONSE:

BC Hydro is not able to provide a direct impact of the Enbridge pipeline rupture on the availability of electricity during the freshet of 2019. Absent the Enbridge pipeline rupture, BC Hydro believes there would still have been a negative impact to ratepayers due to the dry conditions in spring 2019.

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Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 45	\$ (107)	\$ (275)	\$ (337)
June	\$ 65	\$ (91)	\$ (55)	\$ (81)
July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

1.8.4 Please discuss what impact, resulting from the incremental demand of the Freshet Rate during 2018 and prior freshet periods have had on Williston and Kinbasket reservoir levels in October 2018.

RESPONSE:

The Freshet Rate incremental energy had a negligible impact on the elevation of the major reservoirs in 2018.

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8.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 4.1, p. 45, Appendix E, pp. 13–19
Evaluation Report for Year Four**

On page 45 of the Application, BC Hydro states:

BC Hydro has identified that Year 4 of the Freshet Rate pilot represented a substantial change in conditions compared to Years 1 to 3. As described in the 2019 Evaluation Report for Year 4 contained in **Appendix E**, conditions during the May to July 2019 freshet period were characterized by a electricity supply issue as a result of the Enbridge gas pipeline issue and low reservoir inflows. This reduced the freshet energy surplus and contributed to higher system marginal prices and higher market energy imports. These conditions resulted in a revenue loss of \$0.5 million for 2019. This compares to revenue gains of \$2.3 million in 2016, \$2.2 million in 2017 and \$1.9 million in 2018.

... Although there is a risk of loss to ratepayers in any given year if adverse conditions arise, the rate design is expected to provide net benefits to ratepayers over a multiyear time period.

On page 19 of Appendix E, BC Hydro states:

Across the winter of 2018/2019, low winter inflows into the BC Hydro system in combination with the Enbridge Gas Pipeline explosion (that impacted thermal generation) resulted in strong downward pressure on system storage. Williston and Kinbasket Reservoirs both approached record minimum storage levels.

Further on page 16 of Appendix E of the Application, BC Hydro provides the following table:

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	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

1.8.5 Please explain in detail under what conditions would yield revenue losses to BC Hydro in the three factors (i.e. forced export, market import, system basin) identified in Table 5.

RESPONSE:

“Forced export”, “market import”, and “system basin” are synonymous with the marginal resource conditions 1, 2 and 3, respectively, which are described in the Application.

Under condition 1, there is always expected to be a net benefit to the ratepayer.

Under condition 2, there is a ratepayer loss unless the Mid-C price is sufficiently negative (refer to BC Hydro’s response to BCUC IR 1.23.1).

Under condition 3, where system storage is the marginal resource, ‘Revenue gain (loss)’ is a notional term as it is based on the difference between the RS 1892 Rate and the system marginal value at the time of the incremental load.

Please refer to the attachment to BC Hydro’s response to BCUC IR 1.13.3 for detailed calculations of the ratepayer impact from these conditions.

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... Although there is a risk of loss to ratepayers in any given year if adverse conditions arise, the rate design is expected to provide net benefits to ratepayers over a multiyear time period.

On page 19 of Appendix E, BC Hydro states:

Across the winter of 2018/2019, low winter inflows into the BC Hydro system in combination with the Enbridge Gas Pipeline explosion (that impacted thermal generation) resulted in strong downward pressure on system storage. Williston and Kinbasket Reservoirs both approached record minimum storage levels.

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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

1.8.5 Please explain in detail under what conditions would yield revenue losses to BC Hydro in the three factors (i.e. forced export, market import, system basin) identified in Table 5.

1.8.5.1 What mitigation factors, if any, have BC Hydro considered to address any identified conditions.

RESPONSE:

Potential negative ratepayer impacts from serving the incremental load could be mitigated by raising the energy charge adder.

The proposed adder pricing has been chosen because BC Hydro believes it to be low enough to encourage additional load and high enough that other ratepayers are not negatively impacted in most of the scenarios analyzed.

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8.0 B. FRESHET RATE PROPOSAL

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On page 45 of the Application, BC Hydro states:

BC Hydro has identified that Year 4 of the Freshet Rate pilot represented a substantial change in conditions compared to Years 1 to 3. As described in the 2019 Evaluation Report for Year 4 contained in **Appendix E**, conditions during the May to July 2019 freshet period were characterized by a electricity supply issue as a result of the Enbridge gas pipeline issue and low reservoir inflows. This reduced the freshet energy surplus and contributed to higher system marginal prices and higher market energy imports. These conditions resulted in a revenue loss of \$0.5 million for 2019. This compares to revenue gains of \$2.3 million in 2016, \$2.2 million in 2017 and \$1.9 million in 2018.

... Although there is a risk of loss to ratepayers in any given year if adverse conditions arise, the rate design is expected to provide net benefits to ratepayers over a multiyear time period.

On page 19 of Appendix E, BC Hydro states:

Across the winter of 2018/2019, low winter inflows into the BC Hydro system in combination with the Enbridge Gas Pipeline explosion (that impacted thermal generation) resulted in strong downward pressure on system storage. Williston and Kinbasket Reservoirs both approached record minimum storage levels.

Further on page 16 of Appendix E of the Application, BC Hydro provides the following table:

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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

1.8.5 Please explain in detail under what conditions would yield revenue losses to BC Hydro in the three factors (i.e. forced export, market import, system basin) identified in Table 5.

1.8.5.2 Are there any other factors that may contribute to the ratepayer impacts associated with the Freshet Rate?

RESPONSE:

Table 3 of the Freshet Rate Final Evaluation Report, included as Appendix D to the Application, lists the additional factors that impact ratepayers. These are: implementation costs; customer reported load shifting; unexplained load variances; natural load growth; and RS 1880 replacement service.

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9.0 B. FRESHET RATE PROPOSAL

Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 1.1.1, p. 2, Section 4.1, p. 45; Appendix D;
Appendix E, p. 14
Order G-17-16, Reasons for Decision dated February 9, 2016
Curtailment Criteria

On page 45 of the Application, BC Hydro states:

The Freshet Rate is non-firm and interruptible. BC Hydro will provide energy and capacity under this rate schedule only to the extent it is available.

In the Reasons for Decision for the BC Hydro Transmission Service Freshet Rate Pilot dated February 9, 2016, on page 13, one of the evaluation criteria noted was as follows:

Did BC Hydro curtail any customers under the non-firm provisions of the rate? If so, what led to the curtailments? If not, were there any financial impacts on BC Hydro from not curtailing customers during constrained periods?

In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

BC Hydro did not curtail RS 1892 service during the 2019 Freshet Period. Sufficient energy and capacity were available at all times to serve incremental load.

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.1 Please clarify what is meant by “BC Hydro will provide energy and capacity... only to the extent it is available.” What is meant by available (i.e. operationally, economically, or other)?

RESPONSE:

“Available” in this context refers to the availability of energy and capacity not being limited by system constraints. BC Hydro would import to serve RS 1892 and RS 1893 load. BC Hydro does plan to meet this load requirement in an operational view, but we do not add it to our load forecast in a planning view and would not build new resources to meet it.

Proposed Rate Schedule 1892 Special Condition No. 1, provided in Appendix B, provides further clarity and is shown below.

BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 or 88 to provide Service under this Rate Schedule.

The language used in Rate Schedule 1892 Special Condition No. 1 is consistent with BC Hydro’s standard language for non-firm rate schedules that have already been approved by the BCUC. For example: Rate Schedule 1880 – Transmission Service – Standby and Maintenance Supply; Rate Schedule 1853 Transmission Service – IPP Station Service; and Rate Schedule 1891 Transmission Service Shore Power Service.

In all cases of non-firm service, electricity service may be interrupted in circumstances where BC Hydro does not have sufficient energy or capacity, which BC Hydro considers to reflect transmission and generation system constraints.

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9.0 B. FRESHET RATE PROPOSAL

Reference: BC HYDRO'S FRESHET RATE PROPOSAL
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Did BC Hydro curtail any customers under the non-firm provisions of the rate? If so, what led to the curtailments? If not, were there any financial impacts on BC Hydro from not curtailing customers during constrained periods?

In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

BC Hydro did not curtail RS 1892 service during the 2019 Freshet Period. Sufficient energy and capacity were available at all times to serve incremental load.

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.2 Please explain whether the revenue loss in Year 4 of the Freshet Rate Pilot could have been avoided due to curtailment or otherwise.

RESPONSE:

The revenue loss in Year 4 of the Freshet Rate Pilot could not have been avoided due to curtailment, as the conditions required for curtailment under RS 1892 were not present in the Year 4 Freshet Period.

As described in BC Hydro's response to BCUC IR 1.9.1, curtailment under RS 1892 would only have been curtailed in the event energy or capacity was not available. Please refer to BC Hydro's response to BCUC IR 1.9.4 for a discussion of why curtailment is not proposed for economic reasons.

Mitigating losses to ratepayers in Year 4 of the Freshet Energy Rate would have required that either BC Hydro not offer the Freshet Energy Rate, or do so with an energy charge adder that was higher than the \$3/MWh approved as part of RS 1892 by the BCUC. BC Hydro notes that the energy charge adder of \$3/MWh was sufficient to provide ratepayer benefits in years one, two and three of the Freshet Energy Rate pilot.

On April 8, 2019, BC Hydro applied to the BCUC to offer the Freshet Energy Rate in 2019. As described in that application, BC Hydro initially decided to not offer the Freshet Rate in 2019 because of water conditions and the possibility of high Mid-C prices. However, in consideration of customer feedback and the strong performance of the Freshet Energy Rate in prior years, BC Hydro decided to file the application to offer the Freshet Energy Rate in 2019. That application was subsequently approved by BCUC Order No. G-106-19.

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Curtailment Criteria

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In the Reasons for Decision for the BC Hydro Transmission Service Freshet Rate Pilot dated February 9, 2016, on page 13, one of the evaluation criteria noted was as follows:

Did BC Hydro curtail any customers under the non-firm provisions of the rate? If so, what led to the curtailments? If not, were there any financial impacts on BC Hydro from not curtailing customers during constrained periods?

In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

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On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.3 From Year 1 through Year 3, it appears that BC Hydro had two interruption considerations: (i) sufficient energy and capacity available and (ii) no negative financial impact to BC Hydro from not curtailing customers. However, BC Hydro appears to have omitted (ii) financial impact in Year 4. Please explain the changes to BC Hydro's interruption consideration from Year 1 to Year 4.

RESPONSE:

There were no changes to BC Hydro's interruption considerations from Year 1 to Year 4.

The same interruption provisions existed in all four years of the Freshet Rate Pilot. These were described in Special Condition No. 2 of Rate Schedule 1892.

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The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

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On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.4 Please clarify why “BC Hydro does not propose to interrupt these non-firm services for economic reasons.” Please clarify whose economic considerations the statement refers to. Please discuss the benefits and risks to RS 1892 ratepayers, BC Hydro, and all other ratepayers if curtailment is not considered due to “economic reasons”.

RESPONSE:

BC Hydro notes that none of its nine¹ existing, non-firm service Rate Schedules in its Electric Tariff (excluding RS 1892 and RS 1893) require BC Hydro to interrupt the service for economic reasons.

In the Application, interrupting service for economic reasons refers to curtailment of service under conditions where energy and capacity is available, but providing service may result in an economic loss to ratepayers.

BC Hydro would import to serve non-firm load. BC Hydro does plan to meet non-firm load requirement in an operational view, but we do not add it to our load forecast in a planning view and would not build new resources to meet it.

The economic considerations used in the analysis of ratepayer impacts of the Freshet and Incremental Energy Rates refers to the difference between the revenues received for the service under the Freshet or Incremental Energy Rate Schedules and the system marginal value of resources used to serve the incremental load.

While the ability to interrupt service for economic reasons may reduce the risk of such an economic loss to ratepayers, there are barriers to developing reliable and transparent indicators during time periods when service may result in an economic loss to ratepayers. For example, there would be additional costs to BC Hydro and to participating customers associated with developing, communicating and implementing an economic interruption provision. Further, providing public information indicative of the system marginal value of BC Hydro resources could compromise BC Hydro’s ability to benefit from energy trade. BC Hydro considers the system marginal value information to be confidential.

¹ These are: RS 1105, RS 1205, RS 1206, RS 1207, RS 1253, RS 1280, RS 1853, RS 1880 and RS 1891.

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BC Hydro acknowledges that if these non-firm services are not interrupted for economic reasons, then there is a risk of revenue loss that is borne by all ratepayers as was experienced in Year Four of the Freshet Rate Pilot. However, for the four-year Freshet Energy Rate Pilot period, the Freshet Energy Rate pricing was sufficient to result in net benefits to all ratepayers.

BC Hydro's view is that pricing for these proposed non-firm services, and in particular the proposed energy charge adder, reasonably mitigates the risk of providing non-firm service when it might be uneconomic to all ratepayers under certain conditions. As shown in Appendices B and C, the proposed Freshet Energy Rate and Incremental Energy Rate each include an energy charge adder, which is a charge that is added to the market index price to mitigate the risk of such negative impacts to ratepayers. Relative to developing and enforcing reliable and transparent conditions under which service may be interrupted for economic reasons, the proposed adders can achieve similar outcomes for all ratepayers for lower overall administrative cost, complexity and controversy.

Under the proposed Freshet and Incremental Energy Rates, BC Hydro does retain the right to interrupt service due to lack of sufficient capacity and energy, and BC Hydro will not undertake any system reinforcements that may be required to serve the non-firm load.

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9.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 1.1.1, p. 2, Section 4.1, p. 45; Appendix D;
Appendix E, p. 14
Order G-17-16, Reasons for Decision dated February 9, 2016
Curtailment Criteria**

On page 45 of the Application, BC Hydro states:

The Freshet Rate is non-firm and interruptible. BC Hydro will provide energy and capacity under this rate schedule only to the extent it is available.

In the Reasons for Decision for the BC Hydro Transmission Service Freshet Rate Pilot dated February 9, 2016, on page 13, one of the evaluation criteria noted was as follows:

Did BC Hydro curtail any customers under the non-firm provisions of the rate? If so, what led to the curtailments? If not, were there any financial impacts on BC Hydro from not curtailing customers during constrained periods?

In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

BC Hydro did not curtail RS 1892 service during the 2019 Freshet Period. Sufficient energy and capacity were available at all times to serve incremental load.

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.5 If conditions during the May to July 2019 freshet period were characterized by an electricity supply issue as a result of the Enbridge gas pipeline interruption and low reservoir inflows, please explain why BC Hydro did not curtail the supply of electricity under the Freshet Rate Pilot.

RESPONSE:

From May to July 2019, there was an electricity supply issue as a result of the Enbridge gas pipeline interruption and low reservoir inflows which contributed to a reduction in the freshet energy surplus, higher system marginal prices and higher market energy imports.

Under Special Condition 2 of RS 1892, BC Hydro had the right to withdraw service if there was a lack of available energy or capacity. However, BC Hydro still had available energy and capacity to serve RS 1892 customers during this period and therefore did not curtail the supply of electricity under the Freshet Rate Pilot. Please also refer to BC Hydro's response to BCUC IR 1.9.1.

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9.0 B. FRESHET RATE PROPOSAL

Reference: BC HYDRO'S FRESHET RATE PROPOSAL
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On page 45 of the Application, BC Hydro states:

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In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

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BC Hydro did not curtail RS 1892 service during the 2019 Freshet Period. Sufficient energy and capacity were available at all times to serve incremental load.

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.6 In practice, please explain the conditions and priority levels for BC Hydro to curtail RS 1892 Freshet Rate customers.

RESPONSE:

The following are the conditions under which RS 1892 service could be withdrawn:

- For planned or unplanned transmission constraints; and
- For planned or unplanned generation (energy) constraints.

Such events tend to be local or regional in nature as opposed to a system wide provincial constraint. When the constraint is local and only impacts a local subset of RS 1892 customers, BC Hydro will request that only the RS 1892 customers affected by the constraint curtail load. When the constraint is system-wide, all RS 1892 customers will be requested to curtail load. This approach avoids having to establish unique conditions or priority levels for curtailment specific to RS 1892 customers.

As BC Hydro has no direct means to physically curtail loads at the customer site, RS 1892 customers will be asked to curtail load to their Reference Demand level until the constraint is resolved. BC Hydro will follow its curtailment notification procedures as documented in its System Operating Order to effect a curtailment request to RS 1892 customers.

More broadly, under NERC Mandatory Reliability Standards for Capacity and Energy Emergencies, BC Hydro's priority for curtailing loads is to curtail non-firm interruptible loads first (including RS 1892 and other non-firm services) in order to balance the system before curtailing firm loads (including RS 1823 and other firm services) if additional actions are required.

Consistent with these standards, BC Hydro will follow this curtailment priority for both planned and unplanned (including emergency) conditions. BC Hydro may also, without notice to the customer, in emergency conditions and events, terminate the supply of electricity if at any time BC Hydro does not have sufficient energy or capacity.

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9.0 B. FRESHET RATE PROPOSAL

Reference: BC HYDRO'S FRESHET RATE PROPOSAL
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Curtailment Criteria

On page 45 of the Application, BC Hydro states:

The Freshet Rate is non-firm and interruptible. BC Hydro will provide energy and capacity under this rate schedule only to the extent it is available.

In the Reasons for Decision for the BC Hydro Transmission Service Freshet Rate Pilot dated February 9, 2016, on page 13, one of the evaluation criteria noted was as follows:

Did BC Hydro curtail any customers under the non-firm provisions of the rate? If so, what led to the curtailments? If not, were there any financial impacts on BC Hydro from not curtailing customers during constrained periods?

In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

BC Hydro did not curtail RS 1892 service during the 2019 Freshet Period. Sufficient energy and capacity were available at all times to serve incremental load.

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.6 In practice, please explain the conditions and priority levels for BC Hydro to curtail RS 1892 Freshet Rate customers.
- 1.9.6.1 Please specify these curtailment provisions in the proposed tariff.

RESPONSE:

Special Condition No. 1 of RS 1892 currently provides the following provisions for curtailment:

BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 or 88 to provide Service under this Rate Schedule.

BC Hydro has developed notification procedures specific to the curtailment and restoration of RS 1892 service for system constraints. These procedures are incorporated into the System Operating Order, as described in BC Hydro's response to BCUC IR 1.9.6.

However, BC Hydro has not specified any additional curtailment provisions in RS 1892. This is in contrast to BC Hydro's proposed RS 1893. For example:

- **Special Condition No. 3a of RS 1893 requires the customer to satisfy BC Hydro that it can reduce its load to Monthly Reference Demand within one hour of receiving notice to do so from BC Hydro; and**
- **Special Condition No. 4 of RS 1893 describes the consequences if a customer fails to reduce load to its Monthly Reference Demand in accordance with a notice from BC Hydro.**

BC Hydro does not propose interruption criteria as Special Conditions in RS 1892 so as to minimize the technical and administrative burden for BC Hydro and customers associated with a short seasonal rate offer that has a low risk of interruption. For example, during the four-year RS 1892 Pilot, there were no events

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or conditions which required interruption of RS 1892 supply due to insufficient energy or capacity.

BC Hydro intends to utilize an internal daily operations plan for prospective RS 1892 service interruption that will be administered by its real time operating staff. In the event of a system constraint, real time operating staff will follow the notification procedures set out in the System Operating Order to request curtailment of RS 1892 customer loads.

For the reasons above, BC Hydro does not currently view additional curtailment provisions in RS 1892 as being required.

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9.0 B. FRESHET RATE PROPOSAL

Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 1.1.1, p. 2, Section 4.1, p. 45; Appendix D;
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BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

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Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.9.7 Please confirm, or otherwise explain, that during the 2019 Freshet Rate Pilot period, due to a reduction in the availability of the freshet energy surplus, market energy imports were purchased in place of freshet energy to meet load demands under RS 1892.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.2.

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9.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
 Exhibit B-1, Section 1.1.1, p. 2, Section 4.1, p. 45; Appendix D;
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In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

The underlined statement was also noted in the Year 1 and Year 2. However, in Year 4, on page 14 of Appendix E, BC Hydro states:

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

1.9.7 Please confirm, or otherwise explain, that during the 2019 Freshet Rate Pilot period, due to a reduction in the availability of the freshet energy surplus, market energy imports were purchased in place of freshet energy to meet load demands under RS 1892.

1.9.7.1 If confirmed, please quantify the amount of market energy purchased and the associated costs during this time period in order to meet load demands under RS 1892.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.2.

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9.0 B. FRESHET RATE PROPOSAL

Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 1.1.1, p. 2, Section 4.1, p. 45; Appendix D; Appendix E, p. 14
Order G-17-16, Reasons for Decision dated February 9, 2016
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On page 45 of the Application, BC Hydro states:

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In the Reasons for Decision for the BC Hydro Transmission Service Freshet Rate Pilot dated February 9, 2016, on page 13, one of the evaluation criteria noted was as follows:

Did BC Hydro curtail any customers under the non-firm provisions of the rate? If so, what led to the curtailments? If not, were there any financial impacts on BC Hydro from not curtailing customers during constrained periods?

In Appendix D of the Application, the Freshet Rate Pilot Final Evaluation Report – December 2018, BC Hydro states:

BC Hydro did not curtail RS 1892 service to any customer during the 2018 Freshet Period. Sufficient energy and capacity were available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers. [Emphasis added]

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On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater

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certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

1.9.7 Please confirm, or otherwise explain, that during the 2019 Freshet Rate Pilot period, due to a reduction in the availability of the freshet energy surplus, market energy imports were purchased in place of freshet energy to meet load demands under RS 1892.

1.9.7.2 Please explain why BC Hydro incurred market import losses during the Freshet Rate Pilot when RS 1892 rates are based on the Mid-C market price plus an energy charge adder. Were the rates under RS 1892 insufficient to cover BC Hydro's costs to import market energy from Mid-C to serve incremental load during the Freshet Rate Pilot?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.2 for a discussion of ratepayer impacts.

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10.0 B. FRESHET RATE PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, Section 4.1.1, p. 47; *BC Clean Energy Act* Part 1, Section 2
Market Energy Imports and Exports

On page 47 of the Application, BC Hydro states:

In a low inflow year, there is an increased risk that market energy imports might be used to serve incremental energy under the Freshet Rate in any given hour. This is described as “Condition 2: Minimum Generation with Imports” in the Final Evaluation Report and 2019 evaluation report for Year 4.

The *BC Clean Energy Act* Part 1, Section 2, states BC’s energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.10.1 Please discuss how the Freshet Rate affected BC Hydro’s ability to be a net exporter of electricity in each year of the pilot.

RESPONSE:

Shown below are Freshet Energy Rate sales compared to Market Energy Imports or Exports.¹

- **In F2017 total Market Energy exports were 5,488 GWh, while RS 1892 energy sales were 139 GWh;**

¹ Please refer to BC Hydro’s response to CEABC IR 2.43.1 in the BC Hydro Fiscal 2020 to Fiscal 2021 Revenue Requirements Application for additional information on net purchases or sales from Powerex.

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- In F2018 total Market Energy exports were 5,479 GWh, while RS 1892 energy sales were 168 GWh;
- In F2019 total Market Energy imports were 452 GWh, while RS 1892 energy sales were 150 GWh; and
- F2020 total Market Energy imports are not yet available but are forecast to be 5,488 GWh.

BC Hydro notes that net purchases in F2019 were impacted by an electricity supply issue arising from the explosion of the Enbridge Pipeline in October 2018 and low water inflows to BC Hydro's reservoirs.

Generally BC Hydro has a significant surplus that will not be significantly affected by the volumes of energy sales under the Freshet Rate. The expected energy sales under the Freshet Rate are a small fraction of BC Hydro's domestic load, and far less than the variation in system inflows.

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10.0 B. FRESHET RATE PROPOSAL

Reference: INTRODUCTION
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(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.10.2 Please discuss how BC Hydro’s Freshet Rate affected gross and net energy imports in each year of the pilot.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.10.1.

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10.0 B. FRESHET RATE PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, Section 4.1.1, p. 47; *BC Clean Energy Act* Part 1, Section 2
Market Energy Imports and Exports

On page 47 of the Application, BC Hydro states:

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(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.10.3 Please discuss how BC Hydro’s Freshet Rate affected the total percentage of electricity consumed in British Columbia coming from clean or renewable sources.

RESPONSE:

BC Hydro notes that objective (c) referred to in the preamble is specific to electricity generation and not electricity consumption.

British Columbia’s energy objectives as defined the *Clean Energy Act* includes the objective stated in section 2(c), which is to generate at least 93 per cent of the electricity in British Columbia from clean or renewable resources. To the extent there are any incremental imports (not from generation within B.C.) to meet the additional load associated with RS 1893, these incremental imports neither advance nor conflict with this objective.

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In addition, regarding Objective (n), to the extent there are any incremental imports to meet the additional load associated with RS 1892, any emissions associated with such imports would be reported by Powerex as part of the Industrial Facility Greenhouse Gas Emissions as per the British Columbia's *Greenhouse Gas Industrial Reporting Control Act* (GGIRCA). Summary information is publicly reported at:
<https://www2.gov.bc.ca/gov/content/environment/climate-change/data/industrial-facility-ghg>.

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10.0 B. FRESHET RATE PROPOSAL

Reference: INTRODUCTION
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The *BC Clean Energy Act* Part 1, Section 2, states BC’s energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.10.4 If the proposed Freshet Rate is approved as permanent and considering that BC Hydro will use market energy imports to serve load, please discuss how BC Hydro ensures that BC’s Energy Objectives (c) and (n) will be met in the future.

RESPONSE:

BC Hydro’s ability to meet British Columbia’s Energy Objectives (c) or (n) was not impacted by the RS 1892 pilot. On that basis, we expect this to continue should RS 1892 be approved as an ongoing rate.

Please also refer to BC Hydro’s response to BCUC IRs 1.10.1 and 1.10.3.

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10.0 B. FRESHET RATE PROPOSAL

Reference: INTRODUCTION
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(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.10.5 Please explain how the carbon intensity of BC Hydro’s electricity imports is accounted for in BC’s provincial emissions inventory¹.

RESPONSE:

The carbon intensity of BC Hydro’s electricity imports is not included in the Provincial Greenhouse Gas Emissions Inventory referenced in the information request because the inventory only covers the emissions emanating from within the province. Emissions from electricity imports are not reported in the National Inventory Report since they occur outside of the province and are not included in international guidelines on assembly of national inventories (IPCC/UNFCCC

¹ <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory>.

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guidelines). These emission sources are reported in the jurisdiction in which the electricity is generated.²

However, emissions associated with electricity imports into B.C. are reported as part of the Industrial Facility Greenhouse Gas Emissions as per the British Columbia's *Greenhouse Gas Industrial Reporting Control Act* (GGIRCA). Powerex reports emissions associated with electricity imports under the GGIRCA Reporting Regulation Schedule D. Summary information is publicly reported at: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/industrial-facility-ghg>.

² <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory/faq>.

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11.0 B. FRESHET RATE PROPOSAL

Reference: **MARGINAL COST**
Exhibit B-1, pp. 2, 45
System Marginal Value

In footnote 2 on page 2 of the Application, BC Hydro states:

BC Hydro uses “system marginal value” as its marginal cost of energy for incremental sales. The system marginal value represents the estimated marginal value of energy in the system, which is typically the expected value of generation from one of BC Hydro’s large storage reservoirs.

On page 45 of the Application, BC Hydro states “Freshet Rate energy pricing is based on the Mid-C market price, which is expected to be generally reflective of BC Hydro’s marginal cost of energy.”

- 1.11.1 Please reconcile the statement “BC Hydro uses ‘system marginal value’ as its marginal cost of energy for incremental sales” with the statement “Freshet Rate energy pricing is based on the Mid-C market price, which is expected to be generally reflective of BC Hydro’s marginal cost of energy.” Is BC Hydro’s marginal cost of energy equal to the Mid-C market price, or the system marginal value?

RESPONSE:

BC Hydro’s marginal cost of energy under Condition No. 3 is the system marginal value.

The system marginal value is calculated by the monthly Energy Studies modelling, which produces a value of the water in system storage over the three year operating time horizon. As such it is the best value to use as the cost of serving an incremental load when system storage is the marginal resource, Condition No. 3.

The Mid-C market is the dominant trading hub for energy transactions in the Pacific Northwest. The day-ahead Mid-C prices are transparent and available via subscription. The Mid-C market price is an input to the Energy Studies, and is one of the key drivers that can significantly affect the output of the Energy Studies. As such, the Mid-C market price affects BC Hydro’s system marginal value, and BC Hydro has used the Mid-C price as a transparent proxy for BC Hydro’s modelled system marginal value because the Energy Studies and system marginal value are confidential. This is what is implied by the statement

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“Freshet Rate energy pricing is based on the Mid-C market price, which is expected to be generally reflective of BC Hydro’s marginal cost of energy”.

Please note that the Application used the term ‘short run marginal price’, synonymous with ‘system marginal value’. However, BC Hydro’s modelled system marginal value is not specific to system conditions in operations in any given hour, nor the conditions in external markets which can change from hour to hour. Therefore, the system marginal value is not intended to reflect BC Hydro’s actual hourly marginal cost of energy. For example, if the marginal value of the Williston Reservoir is lower than the Kinbasket Reservoir it implies that all of the available units at GMS generating station (Williston) should be used prior to using units at Mica generating station (Kinbasket). However, in operations such a unit configuration is rarely possible due to a number of system needs so the resulting actual generation configuration will be different.

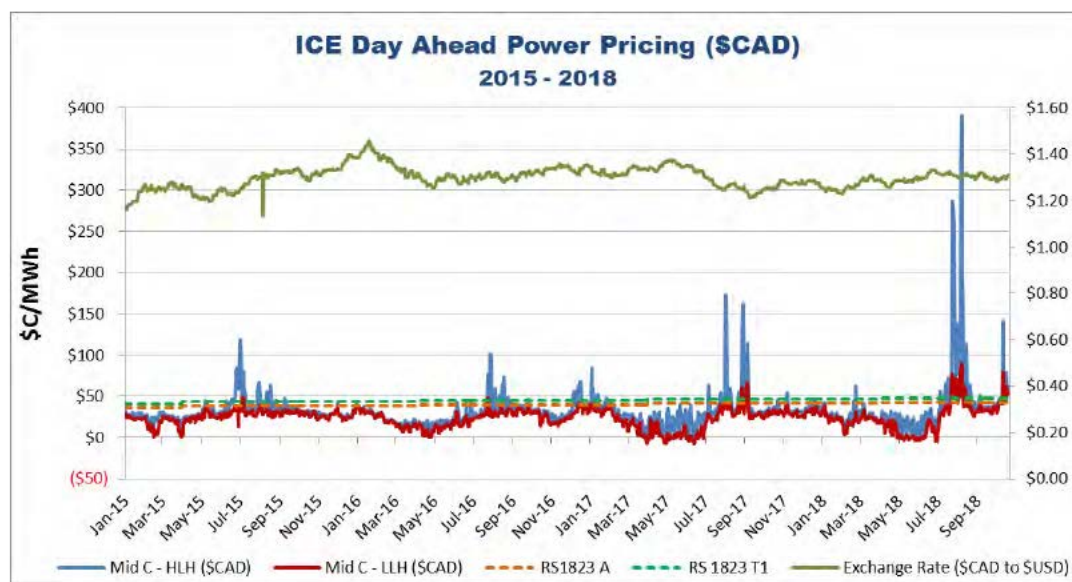
Furthermore, during periods under Condition Nos. 1 and 2, the Mid-C market is considered the marginal cost of energy as incremental load would result in less exports (Condition No. 1) or more imports (Condition No. 2). However, these conditions do not change the modelled system marginal value during those periods.

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12.0 B. FRESHET RATE PROPOSAL

Reference: **MARGINAL COST**
Exhibit B-1, Appendix D, pp. 32, 53
Market Indices

In Figure 12 of Appendix D, BC Hydro provides a historical comparison of the Mid-C Market High Load Hours (HLH) and Low Load Hours (LLH) Prices against the RS 1823 Tier 1 and Part A energy charges.



On page 32 of Appendix D, BC Hydro provides a chart showing its Northwest Power Pool import/export activity during each of the Freshet Rate Pilot. BC Hydro states:

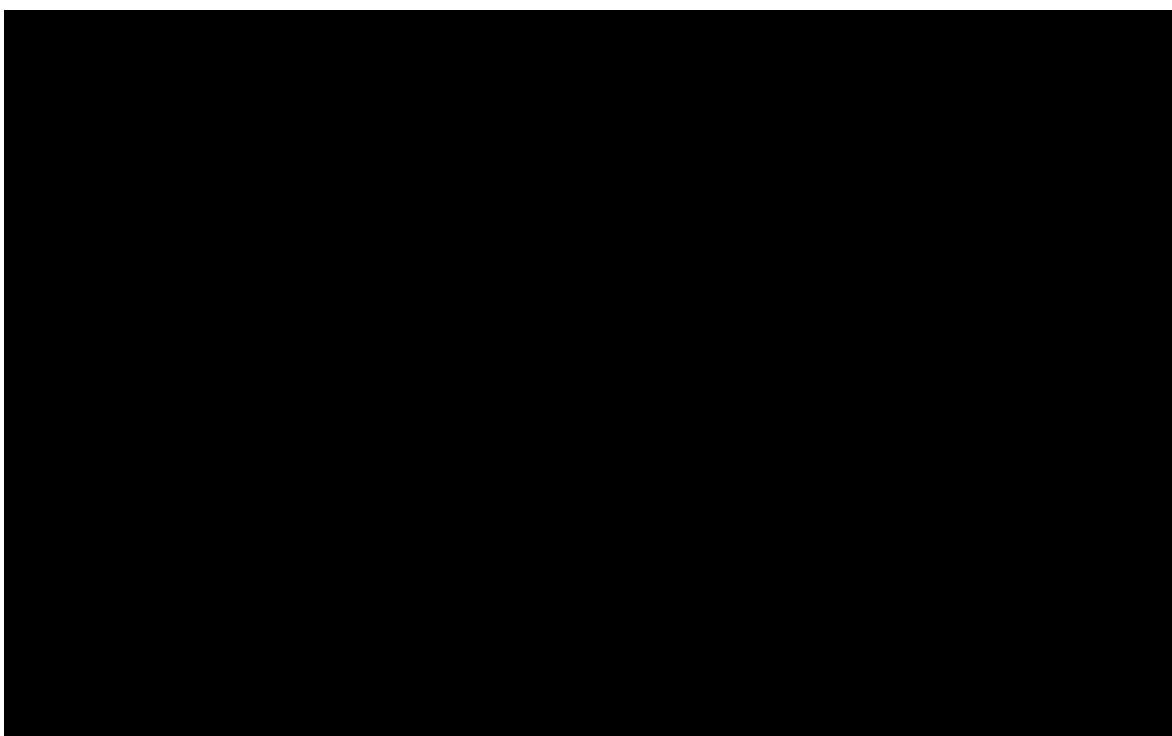
In general, BC Hydro is on net exports for a significant portion of the freshet months (May through July) to manage higher volumes of surplus energy and to enable exports to US and Alberta markets on days when market prices are high.

1.12.1 Please update the Figure 12 to incorporate actual prices up to December 31, 2019.

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RESPONSE:

The requested chart has been updated to include the Mid-C market data information up to December 31, 2019 and is provided below. This chart is provided to the BCUC on a confidential basis and BC Hydro requests confidential treatment of this information as it contains day ahead Mid-C ICE pricing, which has been provided by ICE to BC Hydro subject to confidentiality terms. BC Hydro only has permission to share this data confidentially with the BCUC.

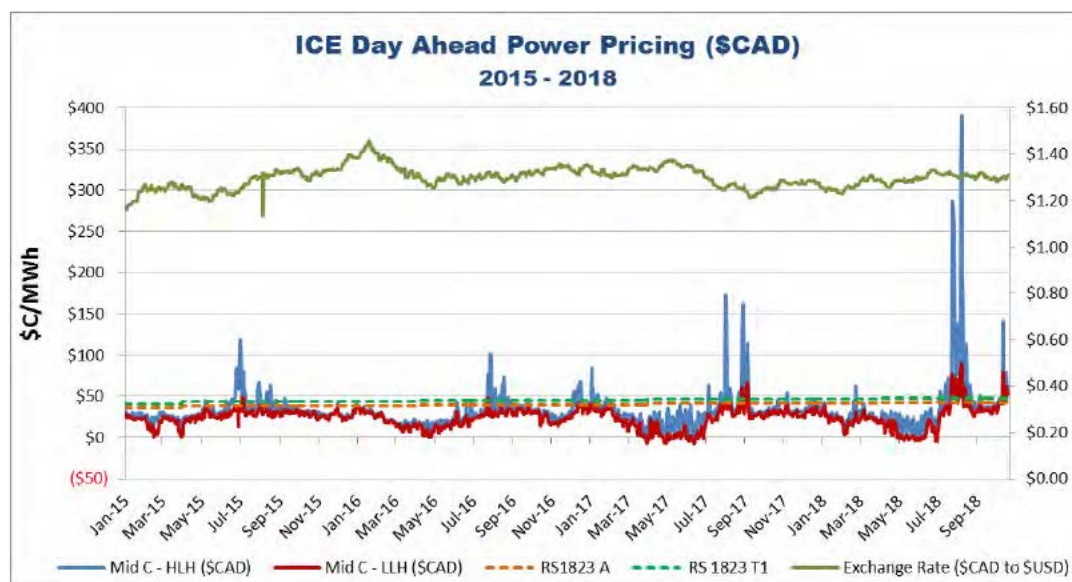


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12.0 B. FRESHET RATE PROPOSAL

Reference: **MARGINAL COST**
Exhibit B-1, Appendix D, pp. 32, 53
Market Indices

In Figure 12 of Appendix D, BC Hydro provides a historical comparison of the Mid-C Market High Load Hours (HLH) and Low Load Hours (LLH) Prices against the RS 1823 Tier 1 and Part A energy charges.



On page 32 of Appendix D, BC Hydro provides a chart showing its Northwest Power Pool import/export activity during each of the Freshet Rate Pilot. BC Hydro states:

In general, BC Hydro is on net exports for a significant portion of the freshet months (May through July) to manage higher volumes of surplus energy and to enable exports to US and Alberta markets on days when market prices are high.

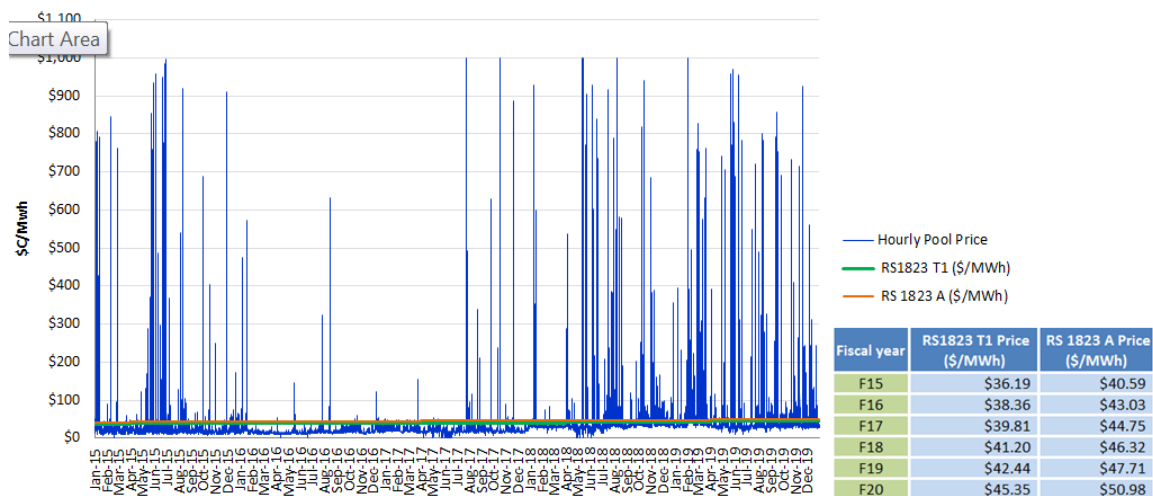
1.12.2 Please create two graphs similar to Figure 12 from the preamble that compares the following data sets up to and including December 31, 2019:

- Graph 1: Mid-C Market HLH, RS1823 A, RS 1823 T1, Alberta Pool HLH Index
- Graph 2: Mid-C Market LLH, RS1823 A, RS 1823 T1, Alberta Pool LLH Index

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RESPONSE:

The Alberta Electric System Operator (AESO) Power Pool is an hourly market and does not transact in HLH/LLH blocks. The requested chart has been prepared comparing the hourly AESO Pool Price with RS 1823 Tier 1 and RS 1823A energy prices for the requested period.



Hourly AESO Power Pool prices are available at <http://ets.aeso.ca/>.

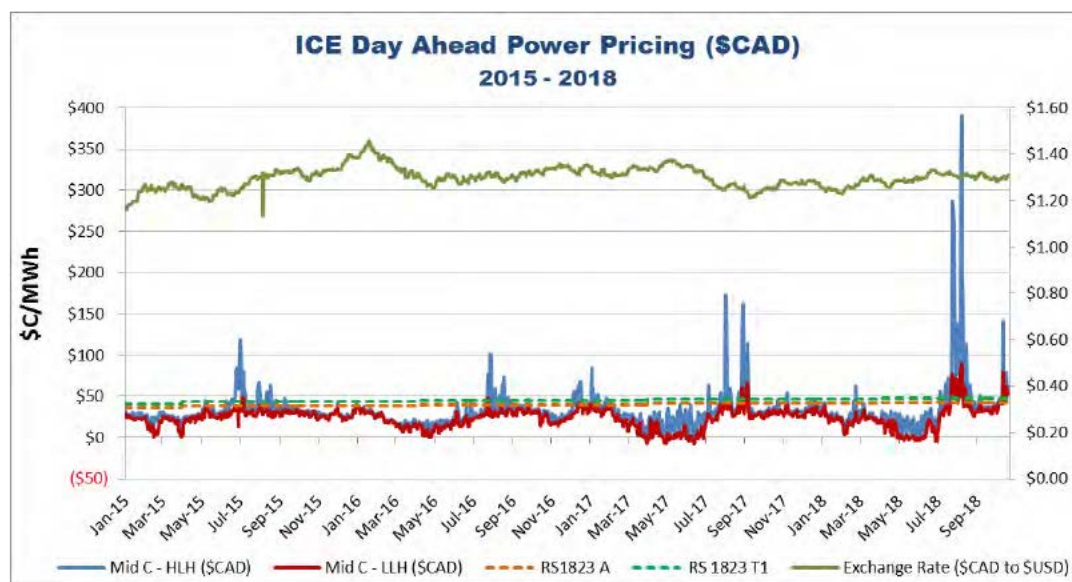
This Mid-C Market HLH and LLH data can be found in BC Hydro's confidential response to BCUC IR 1.12.1.

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12.0 B. FRESHET RATE PROPOSAL

Reference: MARGINAL COST
Exhibit B-1, Appendix D, pp. 32, 53
Market Indices

In Figure 12 of Appendix D, BC Hydro provides a historical comparison of the Mid-C Market High Load Hours (HLH) and Low Load Hours (LLH) Prices against the RS 1823 Tier 1 and Part A energy charges.



On page 32 of Appendix D, BC Hydro provides a chart showing its Northwest Power Pool import/export activity during each of the Freshet Rate Pilot. BC Hydro states:

In general, BC Hydro is on net exports for a significant portion of the freshet months (May through July) to manage higher volumes of surplus energy and to enable exports to US and Alberta markets on days when market prices are high.

1.12.3 Please discuss whether BC Hydro has considered using the Alberta Pool Price¹ as a reference price for the Freshet Rate in place of (or in combination with) the Mid-C market price. Please explain why this would or would not be appropriate? Please assess and compare the pros and cons of using the Alberta Pool Price vs. Mid-C market price, or some combination of the two.

¹ <https://www.aeso.ca/market/market-and-system-reporting/>.

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RESPONSE:

The Intercontinental Exchange Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price was approved to be used as the reference price for the Freshet Rate by BCUC Order No. G-17-16 as part of BC Hydro's 2015 Rate Design Application.²

As part of that application, BC Hydro considered both the market prices at the Alberta Pool and Mid-C and determined that the Mid-C pricing index is appropriate because *“Mid-C reflects BC Hydro’s short run opportunity cost. In addition, flows on the US intertie are much greater than on the Alberta intertie.”*³

When prices in Alberta deviate from Mid-C prices (adjusting for exchange rates and transmission costs between the two markets), the B.C.-Alberta intertie, being significantly smaller than the B.C.-U.S. intertie, becomes fully scheduled such that no incremental energy can flow between B.C. and Alberta, which effectively disconnects the price in Alberta from Mid-C. However, the B.C.-U.S. intertie typically has additional capacity so that incremental energy can flow between B.C. and the U.S., which allows Mid-C to reflect B.C.'s short run opportunity cost as noted above.

² <https://www.bcuc.com/ApplicationView.aspx?ApplicationId=511>.

³ 2015 Rate Design Application, Chapter 7 page 7-40.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 46 of Appendix D to the Application, BC Hydro states:

Footnote 29 – System Minimum Generation – if the system is operating exclusively on must-take energy, then it is considered to be operating at minimum generation.

Footnote 30 – System Minimum Energy – is the sum of must-take and freshet shapeable energy. At times where system minimum energy is higher than system load, there is a system surplus for that time period. When this happens, BC Hydro is forced to either sell the surplus energy or spill.

1.13.1 Please define and explain the term “freshet shapeable energy.”

RESPONSE:

“Freshet shapeable energy” is the energy generated from large storage plants that is required within the freshet period to maintain an acceptable spill risk. This energy can be dispatched to higher value hours, but must be generated during freshet.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 46 of Appendix D to the Application, BC Hydro states:

Footnote 29 – System Minimum Generation – if the system is operating exclusively on must-take energy, then it is considered to be operating at minimum generation.

Footnote 30 – System Minimum Energy – is the sum of must-take and freshet shapeable energy. At times where system minimum energy is higher than system load, there is a system surplus for that time period. When this happens, BC Hydro is forced to either sell the surplus energy or spill.

1.13.2 Please confirm, or otherwise explain, that the only difference between system minimum generation and system minimum energy is freshet shapeable energy.

RESPONSE:

Not confirmed.

System Minimum Generation is a state of the system in which the system is operating exclusively on must-take energy.

System Minimum Energy is a volume of energy, composed of must-take and freshet shapeable energy. A system surplus exists in freshet when this volume of energy is higher than the total energy load in freshet.

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13.0 B. FRESHET RATE PROPOSAL

Reference: **BENEFITS TO NON-PARTICIPANTS**
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

Table 8 on page 25 of Appendix D to the Application shows BC Hydro's calculation of ratepayer benefit (cost) based on three different system conditions, as reflected below:

Table 8 Monthly Ratepayer Benefit by System Condition

	Condition 1	Condition 2	Condition 3	
	\$,000	\$,000	\$,000	\$,000
Year 1 (2016)	Export	Import	System Basin	Ratepayer benefit
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Export	Import	System Basin	Ratepayer benefit
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Export	Import	System Basin	Ratepayer benefit
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
			Total	\$ 6,325

On page 23 of Appendix D, BC Hydro states:

Condition 1: Minimum Generation with Exports

When BC Hydro is experiencing a minimum generation constraint, and there are net exports, incremental domestic sales under RS 1892 will reduce exports. Holding market price constant, BC Hydro will see a revenue increase equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the avoided US \$5.16/MWh wheeling charge paid for energy delivery from the BC border to the Mid-C market (converted to Canadian dollars daily) plus 1.9 per cent transmission losses.

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1.13.3 In a functional spreadsheet format, please provide an example calculation of “Condition 1: Minimum Generation with Exports” that illustrates the revenue increase associated with a reduction in net exports to serve incremental domestic sales under RS 1892 for each of the following scenarios:

- i BC Hydro is experiencing a minimum generation constraint, and the market price (i.e. Mid-C market price) is positive;
- ii BC Hydro is experiencing a minimum generation constraint, and the market price (i.e. Mid-C market price) is negative;
- iii BC Hydro is not experiencing a minimum generation constraint, and the Mid-C market price is positive; and
- iv BC Hydro is not experiencing a minimum generation constraint, and the Mid-C market price is negative.

RESPONSE:

All scenarios from this IR and BCUC IR 1.13.6 are included in Attachment 1 to this response. Please note:

- **Scenarios 1.13.3.i and 1.13.3.ii qualify as Condition No. 1;**
- **Scenarios 1.13.6.i and 1.13.6.ii qualify as Condition No. 2; and**
- **Scenarios 1.13.3.iii and 1.13.3.iv qualify as Condition No. 3 along with scenarios 1.13.6.iii and 1.13.6.iv. They are presented in the attached workbook under conditions where the system is importing and exporting.**

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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13.0 B. FRESHET RATE PROPOSAL

Reference: **BENEFITS TO NON-PARTICIPANTS**
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

1.13.4 Please explain what is meant by the term “economic market imports”.

RESPONSE:

BC Hydro’s economic market imports are purchases from Powerex made because the market price, net of transmission cost, is lower than the Threshold Purchase Price under the Transfer Pricing Agreement. BC Hydro sets the Threshold Purchase Price based on the marginal basin prices in the Energy Studies.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

- 1.13.5 Please explain why load served under RS 1892 would not be curtailed, if all scenarios show that the ratepayer benefit is negative (i.e. costs to ratepayers increase), as reflected in Table 8 of the preamble.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.9.4 where BC Hydro describes the practical and customer barriers to service interruption for economic reasons.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

1.13.6 In a functional spreadsheet format, please provide an example calculation of “Condition 2” Minimum Generation with Imports” that illustrates the revenue decrease associated with increasing economic market imports to serve incremental domestic sales under RS 1892 for each of the following scenarios:

- i BC Hydro is experiencing a minimum generation constraint, and the market price (i.e. Mid-C market price) is positive;
- ii BC Hydro is experiencing a minimum generation constraint, and the market price (i.e. Mid-C market price) is negative;
- iii BC Hydro is not experiencing a minimum generation constraint, and the market Mid-C price is positive; and
- iv BC Hydro is not experiencing a minimum generation constraint, and the market Mid-C price is negative.

RESPONSE:

Please refer to Attachment 1 of BC Hydro’s response to BCUC IR 1.13.3.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

1.13.6 In a functional spreadsheet format, please provide an example calculation of “Condition 2” Minimum Generation with Imports” that illustrates the revenue decrease associated with increasing economic market imports to serve incremental domestic sales under RS 1892 for each of the following scenarios:

- i BC Hydro is experiencing a minimum generation constraint, and the market price (i.e. Mid-C market price) is positive;
- ii BC Hydro is experiencing a minimum generation constraint, and the market price (i.e. Mid-C market price) is negative;
- iii BC Hydro is not experiencing a minimum generation constraint, and the market Mid-C price is positive; and
- iv BC Hydro is not experiencing a minimum generation constraint, and the market Mid-C price is negative.

1.13.6.1 For each scenario, please calculate the alternative where load served under RS 1892 is curtailed and compare the results.

RESPONSE:

Please refer to Attachment 1 to BC Hydro’s response to BCUC IR 1.13.3.

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13.0 B. FRESHET RATE PROPOSAL

Reference: **BENEFITS TO NON-PARTICIPANTS**
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

1.13.7 Please explain whether Network Integrated Transmission Service (NITS) is used to serve load under the Freshet Rate.

RESPONSE:

Yes. As approved by the BCUC, Network Integrated Transmission Service is the form of transmission service that is reserved to allow BC Hydro to serve its domestic load under the Electric Tariff, including customers taking service under the Freshet Energy Rate.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

1.13.7 Please explain whether Network Integrated Transmission Service (NITS) is used to serve load under the Freshet Rate.

1.13.7.1 If yes, please explain why customers under the Freshet Rate appear to not be paying for this NITS cost (or any other third party wheeling costs) on the electricity consumed under the Freshet Rate.

RESPONSE:

All customers served under the Freshet Energy Rate take service under BC Hydro's applicable default rate for firm transmission voltage service. BC Hydro's transmission related costs are recovered through the firm service rate.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 23 of Appendix D, BC Hydro states:

Condition 2: Minimum Generation with Imports

When BC Hydro is experiencing a minimum generation constraint, with economic market imports, incremental domestic sales under RS 1892 will increase market imports. Holding market price constant, BC Hydro will see a revenue decrease equal to the difference between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under RS 1892 and the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days where the market price is negative, the daily revenue loss is reduced by the difference between the actual market price and \$0/MWh floor price under RS 1892.

1.13.7 Please explain whether Network Integrated Transmission Service (NITS) is used to serve load under the Freshet Rate.

1.13.7.2 If no, please confirm, or otherwise explain, that there are no other transaction costs in addition to the “the US \$5.16/MWh wheeling charge paid for energy delivery from the Mid-C market to the BC border (converted to Canadian dollars daily) plus 1.9 per cent transmission losses”.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.13.7.

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13.0 B. FRESHET RATE PROPOSAL

Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis

On page 24 of Appendix D, BC Hydro states:

Condition 3: Higher Basin Generation on the Margin

Holding import/export volumes constant, the loading of BC Hydro's large basin generation will be increased to serve additional RS 1892 load. BC Hydro considers that the cost consequence (i.e., revenue gain or loss) of this circumstance can be estimated by comparing the actual revenue gained from RS 1892 energy sales with the deemed marginal value of the water/energy removed to serve the additional load rather than being held in storage. The value of the incremental generation from the large basin that is operated to serve the load can be expressed as a daily System Marginal Value. For any day where basin energy was used to serve RS 1892 loads, the difference between the value of actual RS 1892 energy sales and BC Hydro's System Marginal Value is used to determine the revenue gain or loss on that day. This condition typically results in a revenue gain for BC Hydro. Similar to Condition 1, where there might otherwise be an export of surplus energy into low-priced markets, a revenue gain arises from the avoidance of wheeling fee and losses to shape and deliver the energy to market in some future period.

- 1.13.8 Please discuss the circumstances under which BC Hydro could hold system energy in storage to supply any customer in a future period rather than to serve RS 1892 load during the current freshet period.

RESPONSE:

The choice to use system storage or imports to serve load (including RS 1892 load) is an economic decision. BC Hydro does not propose to interrupt the RS 1892 non-firm services for economic reasons as described in BC Hydro's response to BCUC IR 1.9.4.

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13.0 B. FRESHET RATE PROPOSAL

**Reference: BENEFITS TO NON-PARTICIPANTS
Exhibit B-1, Appendix D, pp. 23–25, 46
Scenario Analysis**

On page 24 of Appendix D, BC Hydro states:

Condition 3: Higher Basin Generation on the Margin

Holding import/export volumes constant, the loading of BC Hydro's large basin generation will be increased to serve additional RS 1892 load. BC Hydro considers that the cost consequence (i.e., revenue gain or loss) of this circumstance can be estimated by comparing the actual revenue gained from RS 1892 energy sales with the deemed marginal value of the water/energy removed to serve the additional load rather than being held in storage. The value of the incremental generation from the large basin that is operated to serve the load can be expressed as a daily System Marginal Value. For any day where basin energy was used to serve RS 1892 loads, the difference between the value of actual RS 1892 energy sales and BC Hydro's System Marginal Value is used to determine the revenue gain or loss on that day. This condition typically results in a revenue gain for BC Hydro. Similar to Condition 1, where there might otherwise be an export of surplus energy into low-priced markets, a revenue gain arises from the avoidance of wheeling fee and losses to shape and deliver the energy to market in some future period.

- 1.13.9 Please discuss the circumstances under which BC Hydro could hold system energy in storage for export in a future period, rather than serve load under RS 1892 during the current freshet period.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.9.4.

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1.13.9 Please discuss the circumstances under which BC Hydro could hold system energy in storage for export in a future period, rather than serve load under RS 1892 during the current freshet period.

1.13.9.1 In a functional spreadsheet format, please provide an example calculation that illustrates the forgone net revenue gain or loss of future system exports compared to the net revenue gain or loss from serving load under RS 1892. In your response, please explain how this comparison is measured.

RESPONSE:

Please refer to Attachment 1 to BC Hydro's response to BCUC IR 1.13.1 which contains the requested information. Refer specifically to row references 1.13.3.iii and 1.13.3.iv to explain how this comparison is measured.

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14.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 3.1.7, pp. 36–38
Load Shifting Impacts Monitoring**

On page 36 of Appendix D of the Application, BC Hydro states, "BC Hydro sought to identify and verify the energy consumption impact of any load shifting events by participant customers in Year 1 (2016) and Year 2 (2017)."

Further on page 38 of Appendix D, BC Hydro states:

- Identify customers that purchased less RS 1823 energy compared to F2016. The intent of this comparison is to identify any potential relationship between a reduction in RS 1823 energy sales and a corresponding increase in RS 1892 energy sales, such that there was no net annual load increase; and
- Identify customers that purchased more RS 1823 energy compared to F2016. The intent of this comparison is to assess whether there was any relationship between an increase in both RS 1823 energy sales and RS 1892 energy sales, such that the load increase (e.g., natural load growth) might reasonably be expected to have occurred anyway.

1.14.1 Please confirm, or otherwise explain, that BC Hydro will continue to monitor load shifting impacts if the proposed Freshet Rate is made permanent.

RESPONSE:

BC Hydro does not plan to continue to monitor and report on load shifting impacts if the proposed Freshet Rate is made permanent.

BC Hydro has monitored and reported on the Freshet Energy Rate four times, covering each of the four years of the Freshet Energy Rate Pilot. BC Hydro considers the results included in these reports to provide conclusive information on the performance of the Freshet Energy Rate over a variety of conditions. Please refer to Appendices D and E of the Application for these reports.

Monitoring and reporting on individual rate schedules is resource intensive, resulting in increased costs for ratepayers, and is not standard practice for all rate schedules. Given the extensive analysis of the Freshet Energy Rate already completed and included as evidence in this proceeding, BC Hydro does not propose to complete additional monitoring and reporting on Freshet Energy Rate net revenues.

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14.0 B. FRESHET RATE PROPOSAL

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- Identify customers that purchased more RS 1823 energy compared to F2016. The intent of this comparison is to assess whether there was any relationship between an increase in both RS 1823 energy sales and RS 1892 energy sales, such that the load increase (e.g., natural load growth) might reasonably be expected to have occurred anyway.

1.14.1 Please confirm, or otherwise explain, that BC Hydro will continue to monitor load shifting impacts if the proposed Freshet Rate is made permanent.

1.14.1.1 If confirmed, will BC Hydro continue to use F2016 annual energy sales under 1823 to calculate the financial impact for new participants of the Freshet Rate? Please explain BC Hydro's rationale for the comparator year used and whether BC Hydro has considered using more current comparator year(s).

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.14.1 where we explain that BC Hydro does not propose to continue to monitor load shifting impacts.

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15.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 3.2, pp. 19–23; Appendix F
Engagement with Customers and Stakeholders**

BC Hydro states that it conducted broad province-wide engagement with RS 1823 customers, the Association of Major Power and Customers (AMPC) and stakeholders on market reference-priced rates. On pages 22–23 of the Application, BC Hydro provides statistics on the number of attendees at the October 2018, November 2018, and September 2019 workshops. Based on the feedback from these workshops, BC Hydro considers that responses from the participants “demonstrate strong support for the Freshet Rate to be made availability on an ongoing basis.”

In Appendix F of the Application, BC Hydro included letters of support from AMPC, Copper Mountain Mine (BC) Ltd., ERCO Worldwide, and the Ministry of Energy, Mines and Petroleum Resources.

- 1.15.1 To the extent possible, please provide a further breakdown showing the representation of attendees in the following categories: (i) RS 1823 or RS 1828 customers already enrolled in the Freshet Rate Pilot, (ii) RS 1823 or RS 1828 customers not enrolled in the Freshet Rate Pilot, and (iii) non-RS 1823 or 1828 customers.

RESPONSE:

BC Hydro notes that RS 1892 enrolment is specific to each year of the four year Freshet Rate Pilot and so, for simplicity, has differentiated between existing customers that have, or have not, participated in any year of the Pilot.

Per Table 2 of the Application, there were a total of 105 participants for BC Hydro's October 2018 workshop. The breakdown of participants is shown below.

October 2018 Workshop	# of participants	%
Existing customers that have participated in RS 1892	25	24%
Existing customers that have NOT participated in RS 1892	26	25%
Prospective new customers	30	29%
Intervenors and stakeholders	24	23%
Total # of participants	105	100%

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Per Table 3 of the Application, there were a total of 55 participants for BC Hydro's November 2018 workshop. The breakdown of participants is shown below.

November 2018 Workshop	# of participants	%
Existing customers that have participated in RS 1892	17	31%
Existing customers that have NOT participated in RS 1892	8	15%
Prospective new customers	12	22%
Intervenors and stakeholders	18	33%
Total # of participants	55	100%

Per Table 4 of the Application, there were a total of 94 participants for B Hydro's September 2019 workshop. The breakdown of participants is shown below.

September 2019 Workshop	# of participants	%
Existing customers that have participated in RS 1892	33	35%
Existing customers that have NOT participated in RS 1892	42	45%
Prospective new customers	17	18%
Intervenors and stakeholders	2	2%
Total # of participants	94	100%

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15.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
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In Appendix F of the Application, BC Hydro included letters of support from AMPC, Copper Mountain Mine (BC) Ltd., ERCO Worldwide, and the Ministry of Energy, Mines and Petroleum Resources.

1.15.2 The Transmission Service Freshet Rate Pilot – Evaluation Report for Year 4 is dated October 31, 2019. Did BC Hydro communicate Year 4 results to customers and stakeholders, particularly in the September 2019 Workshop, that the pilot experienced a revenue loss of approximately \$0.5 million in Year 4?

RESPONSE:

Yes. Please also refer to BC Hydro's response to BCUC IR 1.15.2.1.

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15.0 B. FRESHET RATE PROPOSAL

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In Appendix F of the Application, BC Hydro included letters of support from AMPC, Copper Mountain Mine (BC) Ltd., ERCO Worldwide, and the Ministry of Energy, Mines and Petroleum Resources.

1.15.2 The Transmission Service Freshet Rate Pilot – Evaluation Report for Year 4 is dated October 31, 2019. Did BC Hydro communicate Year 4 results to customers and stakeholders, particularly in the September 2019 Workshop, that the pilot experienced a revenue loss of approximately \$0.5 million in Year 4?

1.15.2.1 With respect to the letters of support, did BC Hydro communicate to these customers and stakeholders the Year 4 results prior to the parties submitting their letters?

RESPONSE:

Yes, BC Hydro communicated preliminary Year 4 results, including ratepayer impacts, for the Freshet Rate Pilot in its September 2019 Workshops and all subsequent customer and stakeholder engagements prior to filing its Year 4 Evaluation Report with the BCUC on October 31, 2019 as part of its Application. BC Hydro confirms that these Year 4 results (and a draft of the Application) were provided in advance of any party submitting a letter of support.

For reference, the figure below shows slide 25 from BC Hydro's September 2019 Workshop materials. It shows the revenue loss for Year 4 and describes the unique system conditions which characterized the 2019 freshet period.

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YEAR 4 RESULTS: RATEPAYER IMPACT

Year 1 (2016)	Forced Export	Market Import	System Basin	Ratepayer benefit
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Ratepayer benefit
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Ratepayer benefit
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Ratepayer benefit
May	\$ 45	\$ (107)	\$ (275)	\$ (337)
June	\$ 65	\$ (91)	\$ (55)	\$ (81)
July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)

- Exceptionally low 18/19 winter inflows
- Exceptionally low reservoir levels
- Weak 2019 freshet inflows
- High system marginal prices
- Significant increase in # of market import days

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15.0 B. FRESHET RATE PROPOSAL

**Reference: BC HYDRO'S FRESHET RATE PROPOSAL
Exhibit B-1, Section 3.2, pp. 19–23; Appendix F
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In Appendix F of the Application, BC Hydro included letters of support from AMPC, Copper Mountain Mine (BC) Ltd., ERCO Worldwide, and the Ministry of Energy, Mines and Petroleum Resources.

1.15.2 The Transmission Service Freshet Rate Pilot – Evaluation Report for Year 4 is dated October 31, 2019. Did BC Hydro communicate Year 4 results to customers and stakeholders, particularly in the September 2019 Workshop, that the pilot experienced a revenue loss of approximately \$0.5 million in Year 4?

1.15.2.2 Has BC Hydro communicated to any other customers or stakeholders of its Year 4 results prior to filing the Application? Please specify.

RESPONSE:

Prior to filing the Application, BC Hydro did not separately communicate these results to any other customers and stakeholders that did not attend the September 2019 workshops.

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16.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, pp. 58–59
Rationale for the IER Pilot

On page 59, with respect to the IER Pilot, BC Hydro states, “BC Hydro assessed ratepayer impacts under a range of scenarios and expects them to be positive over the pilot period...”

Footnote 36 of page 59 states “The economic analysis considers 46 unique years of historical weather sequences, water inflows and market prices.”

1.16.1 Please confirm, or otherwise explain, how many scenarios were run that assessed ratepayer impacts of the IER Pilot. Identify how many of these scenarios reflected a positive ratepayer impact.

RESPONSE:

The impact of the IER Pilot was based on the 46 weather sequences used in the Energy Studies, and 40 of these weather sequences showed a positive ratepayer impact.

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Footnote 36 of page 59 states “The economic analysis considers 46 unique years of historical weather sequences, water inflows and market prices.”

1.16.2 Please confirm, or otherwise explain, that the statement that “ratepayer impacts under a range of scenarios...” are expected “...to be positive over the pilot period” implies that the IER Pilot is expected to have a favourable rate impact to all ratepayers over the pilot period.

RESPONSE:

Confirmed.

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17.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 5.5.1, pp. 72–73
Economic Justification and Ratepayer Impacts**

On pages 72 to 73 of the Application, BC Hydro states:

BC Hydro uses energy study models designed to optimize BC Hydro's system operations through representation of the components of BC Hydro's load, transmission network, generating system, EPAs and external markets. The models incorporate market prices, inflows and weather conditions for each day of each forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro uses these models to determine an optimal set of reservoir and generating station operations and market transactions, based on current forecast information.

- 1.17.1 Please provide analysis showing how revenues and ratepayer impact of the IER program are expected to vary with a change in reservoir inflows.

RESPONSE:

Revenues under RS 1893 are not expected to vary with a change in reservoir inflows.

Ratepayer impact associated with RS 1893 depends on the system marginal value when the incremental sales are made. The system marginal value is based on inflows, market price, future load, and the elevation of the major reservoirs.

Please refer to BC Hydro's response to BCUC IR 1.16.1 where we describe that 40 of the 46 weather sequences showed a positive ratepayer impact. Each of the sequences has a different inflow.

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17.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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1.17.2 Please confirm whether BC Hydro uses trends in historical data to forecast future reservoir inflows, as opposed to strictly using historical average data.

RESPONSE:

Not confirmed. Please refer to BC Hydro's response to BCUC IR 1.7.3.1 for an explanation of the use of historical data to forecast an ensemble of future reservoir inflows.

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17.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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- 1.17.2 Please confirm whether BC Hydro uses trends in historical data to forecast future reservoir inflows, as opposed to strictly using historical average data.
- 1.17.2.1 If confirmed, please explain how these forecasts differ from BC Hydro's revenue forecasting based on historical weather scenarios.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.7.3.1.

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17.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
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1.17.2 Please confirm whether BC Hydro uses trends in historical data to forecast future reservoir inflows, as opposed to strictly using historical average data.

1.17.2.2 If not, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.7.3.1.

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17.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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1.17.3 Please explain how the revenue gains and losses will affect ratepayers enrolled in the IER pilot and all other BC Hydro ratepayers? In other words, who will benefit from financial gains and who will bear losses associated with the IER Pilot?

RESPONSE:

Any financial gains or losses of the IER Pilot will accrue to all ratepayers.

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18.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, Section 1.1.3, p. 7; Section 5.5.1, pp. 72–73
Hydrology and Operations

On page 7 of the Application, BC Hydro states “The Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but would be offered on a year-round basis.”

On pages 72–73 of the Application, BC Hydro states:

BC Hydro uses energy study models designed to optimize BC Hydro’s system operations through representation of the components of BC Hydro’s load, transmission network, generating system, EPAs and external markets. The models incorporate market prices, inflows and weather conditions for each day of each forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro uses these models to determine an optimal set of reservoir and generating station operations and market transactions, based on current forecast information.

1.18.1 Please list the hydro plants and reservoirs that contributing to the energy used to serve the year-round IER pilot.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.6.1.

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18.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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1.18.1 Please list the hydro plants and reservoirs that contributing to the energy used to serve the year-round IER pilot.

1.18.1.1 For the reservoirs contributing to the IER Pilot, please show how the average water inflow levels (e.g. in GWh/yr and meters) compare to the optimal set of reservoir levels required to run the year-round IER Pilot.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.6.1.

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Hydrology and Operations

On page 7 of the Application, BC Hydro states “The Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but would be offered on a year-round basis.”

On pages 72–73 of the Application, BC Hydro states:

BC Hydro uses energy study models designed to optimize BC Hydro’s system operations through representation of the components of BC Hydro’s load, transmission network, generating system, EPAs and external markets. The models incorporate market prices, inflows and weather conditions for each day of each forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro uses these models to determine an optimal set of reservoir and generating station operations and market transactions, based on current forecast information.

- 1.18.2 How will this year-round IER pilot impact BC Hydro’s short term and medium term resource planning (including operating and maintenance implications on BC Hydro’s generating plants and reservoirs, management of dam water levels, implications of downstream distribution facilities to serve additional load, any capacity constraints on any part of BC Hydro’s system).

RESPONSE:

The incremental RS 1893 energy sales are expected to have a negligible impact on the items listed above. The expected sales of 266 GWh per year is about 0.5 per cent of the expected load, and far less than the variation in system inflows.

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18.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, Section 1.1.3, p. 7; Section 5.5.1, pp. 72–73
Hydrology and Operations

On page 7 of the Application, BC Hydro states “The Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but would be offered on a year-round basis.”

On pages 72–73 of the Application, BC Hydro states:

BC Hydro uses energy study models designed to optimize BC Hydro’s system operations through representation of the components of BC Hydro’s load, transmission network, generating system, EPAs and external markets. The models incorporate market prices, inflows and weather conditions for each day of each forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro uses these models to determine an optimal set of reservoir and generating station operations and market transactions, based on current forecast information.

- 1.18.2 How will this year-round IER pilot impact BC Hydro’s short term and medium term resource planning (including operating and maintenance implications on BC Hydro’s generating plants and reservoirs, management of dam water levels, implications of downstream distribution facilities to serve additional load, any capacity constraints on any part of BC Hydro’s system).
- 1.18.2.1 What curtailment strategies, if any, has BC Hydro considered in the event of an unscheduled plant outage.

RESPONSE:

In the event of an unscheduled plant outage resulting in a generation constraint, BC Hydro and the customer will follow the terms and conditions regarding curtailment described in the Special Conditions of Rate Schedule 1893, as shown in Appendix C of the Application. The relevant special conditions are also copied below.

2. BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be

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required to construct a System Reinforcement under Electric Tariff Supplement Nos. 6 or 88 to provide Service under this Rate Schedule.

3. In order for a Customer to be eligible to take Electricity under this Rate Schedule:

(a) The Customer must satisfy BC Hydro that it can reduce its load to its Monthly Reference Demand within one hour of receiving notice to reduce its load from BC Hydro; and

...

4. If a Customer fails to reduce load to its Monthly Reference Demand in accordance with a notice received from BC Hydro:
(a) the Customer will be charged 150% of the Energy Charge applicable to the hour for all RS 1893 Energy supplied during the period that the Customer failed to reduce its load as determined by BC Hydro; and (b) BC Hydro may, at its discretion, cancel the Customer's service under this Rate Schedule. If a Customer's service is cancelled under this subsection, BC Hydro may require the Customer to install load control relays and associated telecommunications equipment at its facilities, at the Customer's cost, and provide BC Hydro with real-time control of these relays before the Customer is again eligible to take service under this Rate Schedule.

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19.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT RS 1893
 Exhibit B-1, Section 1.1.1, p. 2, Appendix C, p. 5
 Interruption Criteria**

On page 5 of Appendix C to the Application, BC Hydro states “BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has the energy and capacity to do so.”

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.19.1 Please clarify what is meant by the statement that BC Hydro agrees to provide electricity “... to the extent that it has the energy and capacity to do so.” As part of your response, please identify what factors are taken into consideration (i.e. operationally, financially, or other)?

RESPONSE:

The conditions under which RS 1892 and RS 1893 service could be withdrawn are for planned and unplanned transmission and generation constraints.

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19.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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Exhibit B-1, Section 1.1.1, p. 2, Appendix C, p. 5
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Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

1.19.1 Please clarify what is meant by the statement that BC Hydro agrees to provide electricity “... to the extent that it has the energy and capacity to do so.” As part of your response, please identify what factors are taken into consideration (i.e. operationally, financially, or other)?

1.19.1.1 Please confirm, or otherwise explain, that imports may be required to serve customers under the IER Pilot whenever sufficient energy or capacity exists.

RESPONSE:

BC Hydro confirms that imports may be used to serve customers under the IER pilot. BC Hydro is obliged to provide service to the extent it has sufficient energy and capacity available.

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19.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT RS 1893
Exhibit B-1, Section 1.1.1, p. 2, Appendix C, p. 5
Interruption Criteria**

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On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

1.19.2 Please clarify why “BC Hydro does not propose to interrupt these non-firm services for economic reasons.” Please clarify whose “economic reasons” is referred to in the above underlined portion of the preamble. Please discuss the benefits and risks to RS 1893 ratepayers, BC Hydro, and all other ratepayers if curtailment is not considered due to “economic reasons”.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.9.4.

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19.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT RS 1893
Exhibit B-1, Section 1.1.1, p. 2, Appendix C, p. 5
Interruption Criteria**

On page 5 of Appendix C to the Application, BC Hydro states “BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has the energy and capacity to do so.”

On page 2 of the Application, with respect to the proposed Freshet Rate and Incremental Energy Rate Pilot, BC Hydro also states:

Minimize risk to all ratepayers by not requiring BC Hydro to undertake system reinforcements and not requiring BC Hydro to provide service if the electrical system is constrained for technical reasons such as forced or planned outages of its transmission or generation system. For greater certainty, BC Hydro does not propose to interrupt these non-firm services for economic reasons. [Emphasis added]

- 1.19.3 Please discuss whether the process BC Hydro would use to apply curtailments to customers under the IER Pilot would be the same process BC Hydro uses to apply curtailments to customers under different non-firm and interruptible rate schedules, including RS 1892. If there are any differences in treatment, please specify and explain.

RESPONSE:

For non-firm interruptible transmission voltage rate schedules, BC Hydro’s right to curtail is the same. However, there may be differences in the procedures related to interruption of service as specified in each different rate schedule.

For example, under Special Condition No. 4 of RS 1891 for Shore Power service, BC Hydro may dispatch a power line technician or other work to operate the switchgear for each connect and disconnect of Eligible Vessels. This procedure does not apply to any other transmission voltage non-firm rate schedule. In contrast, RS 1853 (IPP Station Service), RS 1880 (Standby and Maintenance Service) and RS 1892 (Freshet Energy Rate) do not specify any procedures for interruption or for curtailment, whereas RS 1893 (Incremental Energy Rate) does.

Please refer to BC Hydro’s response to BCUC IR 1.18.2.1 for the special conditions regarding curtailment under RS 1893.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: SYSTEM MARGINAL VALUE
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.1 Please provide an example calculation in Excel format that illustrates a forecast net revenue gain to BC Hydro when forecast RS 1893 revenue is greater than the cost of supply.

RESPONSE:

The requested Excel spreadsheet is provided as Attachment 1 to this response.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: SYSTEM MARGINAL VALUE
Exhibit B-1, pp. 73–74

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On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.2 Please provide an example calculation in Excel format that illustrates a forecast net revenue loss to BC Hydro when forecast RS 1893 revenue is less than the cost of supply.

RESPONSE:

The requested Excel spreadsheet is provided as Attachment 1 to this response.



REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **SYSTEM MARGINAL VALUE**
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.3 Please explain why the system marginal value is used to represent the cost of supply.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.11.1.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **SYSTEM MARGINAL VALUE**
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.3 Please explain why the system marginal value is used to represent the cost of supply.

1.20.3.1 Please discuss whether system marginal value, or some other value, would be the appropriate marginal cost measurement if BC Hydro was required to import electricity to serve load under the IER Pilot.

RESPONSE:

BC Hydro expects that the evaluation of the ratepayer impact for the IER Pilot will be done using the same methodology (e.g., Condition Nos. 1, 2, 3) as was done for evaluating the ratepayer impact of the Freshet Rate Pilot.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **SYSTEM MARGINAL VALUE**
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.4 Please discuss whether BC Hydro could choose to export energy from the system at a later period rather than serve load under RS 1893 in the current period, if it were deemed to generate higher expected net revenues.

RESPONSE:

Under the terms of the proposed RS 1893, BC Hydro could not choose to export energy from the system at a later period rather than serve load under RS 1893 in the current period if it were deemed to generate higher expected net revenues.

As described in the proposed Special Condition No. 2 of RS 1893 included in Appendix C of the Application, BC Hydro agrees to provide service under this rate schedule only to the extent it has available energy and capacity to do so.

Please also refer to BC Hydro's response to BCUC IR 1.9.4.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **SYSTEM MARGINAL VALUE**
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.5 Please discuss whether imports could be used to serve load for RS 1893 customers.

RESPONSE:

Market purchases from Powerex may or may not be used to serve incremental load. It depends on the price of the market purchases, the marginal resource condition and the system marginal price at the time of the incremental load.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **SYSTEM MARGINAL VALUE**
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.5 Please discuss whether imports could be used to serve load for RS 1893 customers.

1.20.5.1 If yes, please provide an example calculation in Excel format that illustrates a forecast net revenue gain or loss to BC Hydro consequent to using imports to serve load to RS 1893 customers.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.20.5.

For an example calculation of the impact under the marginal resource Condition No. 2, system minimum generation with imports, please refer to rows 9 and 10 on both tabs of Attachment 1 to BC Hydro's response to BCUC IR 1.20.1.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **SYSTEM MARGINAL VALUE**
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.5 Please discuss whether imports could be used to serve load for RS 1893 customers.

1.20.5.2 If yes, please explain whether NITS is used in cases where market energy is imported to serve load under the IER Pilot.

RESPONSE:

Network Integrated Transmission Service (NITS) is the form of transmission service that is reserved to allow BC Hydro to serve all of its domestic load under the Electric Tariff, irrespective of the source of supply, including customers taking service under the Incremental Energy Rate.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: SYSTEM MARGINAL VALUE
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.5 Please discuss whether imports could be used to serve load for RS 1893 customers.

1.20.5.2 If yes, please explain whether NITS is used in cases where market energy is imported to serve load under the IER Pilot.

1.20.5.2.1 If NITS is used, please explain why the IER Pilot customers appear to not be paying this portion of BC Hydro's NITS (or any other third party wheeling costs), in cases where market energy imports are used to serve this load.

RESPONSE:

All customers served under the proposed Incremental Energy Rate take service under a firm service rate, either RS 1823 or RS 1828 as applicable, for their baseline load. BC Hydro's NITS costs are recovered through the firm service rate.

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20.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: SYSTEM MARGINAL VALUE
Exhibit B-1, pp. 73–74

Scenario Analysis

On pages 73 to 74 of the Application, BC Hydro states:

BC Hydro used its forecast of system marginal value from the energy study models in estimating the ratepayer impact of serving incremental customer load under the proposed Incremental Energy Rate Pilot for the pilot period. This methodology and approach is consistent with the ratepayer impact analysis described in the Final Evaluation Report and the 2019 evaluation report for Year 4.

The system marginal value represents the estimated marginal value of energy stored as water in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs.

For the Incremental Energy Rate Pilot:

- Where the forecast RS 1893 revenue is greater than the cost of supply evaluated at the system marginal value, there is a forecast net revenue gain to BC Hydro; and
- Where the forecast RS 1893 revenue is less than the cost of supply evaluated at the system marginal value, there is a forecast net revenue loss to BC Hydro.

1.20.6 Please provide a historical monthly chart in Excel format that compares the system marginal values against the daily Mid-C price over the past 10 years. As part of the response, please include a brief description of the relative difference between Mid-C and system marginal value and explain any notable annual or monthly trends or correlations between the two values.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.11.1. In that response we describe the rationale for using the system marginal value to assess the energy cost of serving an incremental load under RS 1893 and also explain that Mid-C prices are an input into BC Hydro's Energy Studies which determine our system marginal values.

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BC Hydro is unable to provide the comparison of the system marginal values against the daily Mid-C price over the last ten years in the time provided. To develop the data set would require going back in daily files to pull out the basin prices. This process would be manual and would be a significant amount of work. Furthermore, BC Hydro does not compare or correlate historic Mid-C prices against its system marginal value because doing so serves no operational purpose as we do not expect them to be the same.

BC Hydro does not make its basin prices or system marginal values public as they are outputs from the energy studies and could be used by third parties to help calibrate a model of BC Hydro's system and its potential import and export requirements. Enabling parties to predict BC Hydro's import and export requirements could impact BC Hydro's ability to optimize its system which could in turn harm ratepayers. As a result, BC Hydro does not want to provide this highly sensitive commercial information at all but would provide it to the BCUC on a confidential basis.

BC Hydro assumes that the purpose of this information request is to estimate the potential economic impacts of RS 1893 to all ratepayers, by comparing revenues which are proposed to be based on Mid-C market prices, to BC Hydro's costs, as approximated by BC Hydro's system marginal values. Based on this assumption, BC Hydro respectfully submits that the appropriate way to compare revenues with approximated costs is by using the methodologies that BC Hydro has applied for the Freshet Energy Rate (described in section 3.1.1.2 of Appendix D – Freshet Rate Final Evaluation Report), and extending that methodology to the full year as we commit to do so in our evaluation of RS 1893.

The proposed RS 1893 evaluation criteria and reporting is described in section 5.7 of the Application. BC Hydro is amenable to the BCUC and Intervener feedback on the scope of the evaluation.

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21.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS
Exhibit B-1, pp. 75–76**

Energy Charge Adder Modelling Assumptions

On pages 75 to 76 of the Application, BC Hydro states:

A key sensitivity for estimating the ratepayer impact is the pricing of the energy charge adder. The adder is designed to mitigate the forecast risk of under-recovering marginal costs from participant customers and to incorporate a reasonable margin to address uncertainties and make a contribution to fixed costs. BC Hydro considered various options for the adder that will provide price signals to participant customers that are fair, transparent and easy to understand. For example, by shaping the pricing of the adder in specific months, BC Hydro can send a relative price signal to customers regarding the prospective incremental costs of energy which impact the risk of revenue under-recovery in that month.

BC Hydro's financial modeling is designed to estimate forecast incremental energy volumes and net revenue for the Incremental Energy Rate Pilot. The model incorporates forward-looking data inputs for the three-year period of fiscal 2020 to fiscal 2022. The results are sensitive to BC Hydro's forecast of system marginal values, forecast Mid-C market prices, assumed customer-specific incremental consumption and energy charge adder pricing.

Key model assumptions are as follows:

- \$55/MWh all-in customer strike price¹ for incremental non-firm load;
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices;
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact; and
- Results are preliminary, illustrative and subject to change.

Customer-specific assumptions regarding incremental load potential were provided to BC Hydro staff through confidential meetings and discussions. Estimates of incremental load were validated against prior Freshet Rate results and known plant operational capabilities.

1.21.1 Please clarify and substantiate BC Hydro's statement, "the adder is designed to mitigate the forecast risk of under-recovering marginal costs from participant customers and to incorporate a

¹ On page 74 of the Application, BC Hydro describes the "strike price" to be the estimated price at which the customer will stop taking incremental load and/or turndown to their baseline.

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reasonable margin to address uncertainties and make a contribution to fixed costs.” Please provide calculations to illustrate that forecast revenues collected by serving load under RS 1892 are sufficient to recover costs under this rate schedule over the pilot period.

RESPONSE:

BC Hydro expects that total RS 1893 revenue (including the adder) will be higher than system marginal value on some days and lower than system marginal value on others. Illustrative calculations are shown in the table below for a sample week under Condition No. 3 with all values in Canadian dollars. For further examples please see the attachments to BC Hydro’s responses to BCUC IRs 1.20.1, 1.20.2, and BCOAPO IR 1.26.2.

In all cases under Condition No. 3, the daily revenue over-recovery or under-recovery for net daily RS 1893 energy sales arises from the difference between the Mid-C index price (plus adder) and the system marginal value on the given day.

Illustrative RS 1893 Calculations: Sample Week	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Totals
Net RS 1893 energy sales volume in HLH (MWh)	600	600	600	600	600	600	0	
Mid-C index price in HLH (\$/MWh)	\$ 30	\$ 32	\$ 34	\$ 36	\$ 38	\$ 40	\$ -	
Energy charge adder (\$/MWh)	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ -	
Total RS 1893 energy charge (\$/MWh)	\$ 37	\$ 39	\$ 41	\$ 43	\$ 45	\$ 47	\$ -	
System Marginal Value in HLH (\$/MWh)	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ 40	\$ -	
Unit energy price difference: (\$/MWh)	\$ (3)	\$ (1)	\$ 1	\$ 3	\$ 5	\$ 7	\$ -	
Revenue gain/(loss) for RS 1893 HLH energy sales (\$)	\$ (1,800)	\$ (600)	\$ 600	\$ 1,800	\$ 3,000	\$ 4,200	\$ -	\$7,200
Net RS 1893 energy sales volume in LLH (MWh)	300	300	300	300	300	300	900	
Mid-C index price in LLH (\$/MWh)	\$ 20	\$ 21	\$ 22	\$ 23	\$ 24	\$ 25	\$ 25	
Energy charge adder (\$/MWh)	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	
Total RS 1893 energy charge (\$/MWh)	\$ 27	\$ 28	\$ 29	\$ 30	\$ 31	\$ 32	\$ 32	
System Marginal Value in LLH (\$/MWh)	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30	
Unit energy price difference: (\$/MWh)	\$ (3)	\$ (2)	\$ (1)	\$ -	\$ 1	\$ 2	\$ 2	
Revenue gain/(loss) for RS 1893 LLH energy sales (\$)	\$ (900)	\$ (600)	\$ (300)	\$ -	\$ 300	\$ 600	\$ 1,800	\$ 900
Total daily net RS 1893 energy sales (MWh)	900	900	900	900	900	900	900	
Total revenue gain/(loss) for RS 1893 energy sales (\$)	\$ (2,700)	\$ (1,200)	\$ 300	\$ 1,800	\$ 3,300	\$ 4,800	\$ 1,800	\$8,100

For the provision of RS 1893 service, a net revenue gain represents an over-recovery of BC Hydro’s marginal energy costs. Conversely, a net revenue loss represents an under-recovery of BC Hydro’s marginal energy costs.

On a forecast annual basis, BC Hydro expects that forecast RS 1893 net revenue (including the adder) will be \$1.3 million. Please refer to Table 9 in the Application. As such, BC Hydro considers that forecast RS 1893 revenue will be sufficient to recover its forecast marginal cost of energy for providing RS 1893 service.

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21.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS
 Exhibit B-1, pp. 75–76**

Energy Charge Adder Modelling Assumptions

On pages 75 to 76 of the Application, BC Hydro states:

A key sensitivity for estimating the ratepayer impact is the pricing of the energy charge adder. The adder is designed to mitigate the forecast risk of under-recovering marginal costs from participant customers and to incorporate a reasonable margin to address uncertainties and make a contribution to fixed costs. BC Hydro considered various options for the adder that will provide price signals to participant customers that are fair, transparent and easy to understand. For example, by shaping the pricing of the adder in specific months, BC Hydro can send a relative price signal to customers regarding the prospective incremental costs of energy which impact the risk of revenue under-recovery in that month.

BC Hydro's financial modeling is designed to estimate forecast incremental energy volumes and net revenue for the Incremental Energy Rate Pilot. The model incorporates forward-looking data inputs for the three-year period of fiscal 2020 to fiscal 2022. The results are sensitive to BC Hydro's forecast of system marginal values, forecast Mid-C market prices, assumed customer-specific incremental consumption and energy charge adder pricing.

Key model assumptions are as follows:

- \$55/MWh all-in customer strike price¹ for incremental non-firm load;
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices;
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact; and
- Results are preliminary, illustrative and subject to change.

Customer-specific assumptions regarding incremental load potential were provided to BC Hydro staff through confidential meetings and discussions. Estimates of incremental load were validated against prior Freshet Rate results and known plant operational capabilities.

¹ On page 74 of the Application, BC Hydro describes the "strike price" to be the estimated price at which the customer will stop taking incremental load and/or turndown to their baseline.

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- 1.21.2 Please explain whether price elasticity has been considered in the financial modelling used in estimating forecast incremental energy volumes and net revenues for the IER Pilot. Discuss how price elasticity would affect the results.

RESPONSE:

BC Hydro has not used price elasticity for modelling customer response to the Incremental Energy Rate. As such, BC Hydro is unable to quantify how doing so may affect the results.

Directionally, BC Hydro does not expect that using price elasticity would improve the accuracy of our estimate of customer response to RS 1893. This is because price elasticity assumes that a customer's price response is continuous, i.e. each percentage change in price results in a fixed percentage change in electricity usage. In contrast, customers taking service under RS 1892 have exhibited a more binary price response. Customers generally take RS 1892 energy when the price is below a predetermined acceptable level (described as a strike price in the Application), and reduce their usage to baseline levels if the price exceeds that level.

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21.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS
Exhibit B-1, pp. 75–76**

Energy Charge Adder Modelling Assumptions

On pages 75 to 76 of the Application, BC Hydro states:

A key sensitivity for estimating the ratepayer impact is the pricing of the energy charge adder. The adder is designed to mitigate the forecast risk of under-recovering marginal costs from participant customers and to incorporate a reasonable margin to address uncertainties and make a contribution to fixed costs. BC Hydro considered various options for the adder that will provide price signals to participant customers that are fair, transparent and easy to understand. For example, by shaping the pricing of the adder in specific months, BC Hydro can send a relative price signal to customers regarding the prospective incremental costs of energy which impact the risk of revenue under-recovery in that month.

BC Hydro's financial modeling is designed to estimate forecast incremental energy volumes and net revenue for the Incremental Energy Rate Pilot. The model incorporates forward-looking data inputs for the three-year period of fiscal 2020 to fiscal 2022. The results are sensitive to BC Hydro's forecast of system marginal values, forecast Mid-C market prices, assumed customer-specific incremental consumption and energy charge adder pricing.

Key model assumptions are as follows:

- \$55/MWh all-in customer strike price¹ for incremental non-firm load;
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices;
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact; and
- Results are preliminary, illustrative and subject to change.

Customer-specific assumptions regarding incremental load potential were provided to BC Hydro staff through confidential meetings and discussions. Estimates of incremental load were validated against prior Freshet Rate results and known plant operational capabilities.

¹ On page 74 of the Application, BC Hydro describes the "strike price" to be the estimated price at which the customer will stop taking incremental load and/or turndown to their baseline.

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- 1.21.3 Please clarify whether BC Hydro's use of the "strike price" should be interpreted to mean the term used in financial securities (e.g. the exercise price in an option contract).²

RESPONSE:

The strike price is intended to reflect the notional RS 1893 price at which a participant customer will voluntarily elect to reduce its take of incremental energy under RS 1893 to baseline levels to avoid incurring an energy charge for RS 1893 energy purchases that might otherwise be deemed uneconomic by the customer.

² For example:
<https://www.cfainstitute.org/-/media/documents/book/rf-publication/2013/rf-v2013-n3-1-sum.ashx> (p. 4).

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21.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS
Exhibit B-1, pp. 75–76**

Energy Charge Adder Modelling Assumptions

On pages 75 to 76 of the Application, BC Hydro states:

A key sensitivity for estimating the ratepayer impact is the pricing of the energy charge adder. The adder is designed to mitigate the forecast risk of under-recovering marginal costs from participant customers and to incorporate a reasonable margin to address uncertainties and make a contribution to fixed costs. BC Hydro considered various options for the adder that will provide price signals to participant customers that are fair, transparent and easy to understand. For example, by shaping the pricing of the adder in specific months, BC Hydro can send a relative price signal to customers regarding the prospective incremental costs of energy which impact the risk of revenue under-recovery in that month.

BC Hydro's financial modeling is designed to estimate forecast incremental energy volumes and net revenue for the Incremental Energy Rate Pilot. The model incorporates forward-looking data inputs for the three-year period of fiscal 2020 to fiscal 2022. The results are sensitive to BC Hydro's forecast of system marginal values, forecast Mid-C market prices, assumed customer-specific incremental consumption and energy charge adder pricing.

Key model assumptions are as follows:

- \$55/MWh all-in customer strike price¹ for incremental non-firm load;
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices;
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact; and
- Results are preliminary, illustrative and subject to change.

Customer-specific assumptions regarding incremental load potential were provided to BC Hydro staff through confidential meetings and discussions. Estimates of incremental load were validated against prior Freshet Rate results and known plant operational capabilities.

¹ On page 74 of the Application, BC Hydro describes the "strike price" to be the estimated price at which the customer will stop taking incremental load and/or turndown to their baseline.

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- 1.21.4 To what extent is BC Hydro's \$55/MWh strike price for incremental non-firm load is based on the trade-off to take firm service under the Tier 2 rate of RS 1823 (and the comparable RS 1828, as applicable).

RESPONSE:

For greater certainty, the \$55/MWh "strike price" is not part of RS 1893 and is not a BC Hydro price. It represents a notional price point communicated to BC Hydro by customers during consultation where, all else being equal, the customer might seek to curtail incremental energy use to baseline levels to avoid incurring an energy charge that they consider to be uneconomic.

It is BC Hydro's understanding that customers consider the notional \$55/MWh strike price to approximate the average unit price of RS 1823 Tier 1 energy (currently \$45.35/MWh), plus the RS 1823 demand charge (currently \$8.695/kVA). This notional pricing consideration is similar for the two customers taking service under RS 1828.

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21.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS
Exhibit B-1, pp. 75–76**

Energy Charge Adder Modelling Assumptions

On pages 75 to 76 of the Application, BC Hydro states:

A key sensitivity for estimating the ratepayer impact is the pricing of the energy charge adder. The adder is designed to mitigate the forecast risk of under-recovering marginal costs from participant customers and to incorporate a reasonable margin to address uncertainties and make a contribution to fixed costs. BC Hydro considered various options for the adder that will provide price signals to participant customers that are fair, transparent and easy to understand. For example, by shaping the pricing of the adder in specific months, BC Hydro can send a relative price signal to customers regarding the prospective incremental costs of energy which impact the risk of revenue under-recovery in that month.

BC Hydro's financial modeling is designed to estimate forecast incremental energy volumes and net revenue for the Incremental Energy Rate Pilot. The model incorporates forward-looking data inputs for the three-year period of fiscal 2020 to fiscal 2022. The results are sensitive to BC Hydro's forecast of system marginal values, forecast Mid-C market prices, assumed customer-specific incremental consumption and energy charge adder pricing.

Key model assumptions are as follows:

- \$55/MWh all-in customer strike price¹ for incremental non-firm load;
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices;
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact; and
- Results are preliminary, illustrative and subject to change.

Customer-specific assumptions regarding incremental load potential were provided to BC Hydro staff through confidential meetings and discussions. Estimates of incremental load were validated against prior Freshet Rate results and known plant operational capabilities.

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- 1.21.5 Please confirm whether the “expected value of energy in the system” is equivalent to the system marginal price. If not, please explain what “expected value of energy in the system” means.

RESPONSE:

Confirmed. This is also equivalent to ‘system marginal value’.

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22.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS**
Exhibit B-1, pp. 76–80
Assessment of Energy Adder Alternatives

Table 6 on page 76 of the Application is shown below, and summarizes the six energy charge adder alternatives:

Table 6 Summary of Energy Charge Adder Alternatives

ENERGY CHARGE ADDER ALTERNATIVES (\$/MWh)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Option 1A - Flat	\$8.00	\$8.00	\$8.00	\$8.00	\$3.00	\$3.00	\$3.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00
Option 1B - Shaped	\$9.00	\$9.00	\$9.00	\$6.00	\$3.00	\$3.00	\$3.00	\$6.00	\$6.00	\$9.00	\$9.00	\$9.00
Option 2A - Flat	\$7.00	\$7.00	\$7.00	\$7.00	\$3.00	\$3.00	\$3.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00
Option 2B - Shaped	\$8.00	\$8.00	\$8.00	\$5.00	\$3.00	\$3.00	\$3.00	\$5.00	\$5.00	\$8.00	\$8.00	\$8.00
Option 3A - Flat	\$6.00	\$6.00	\$6.00	\$6.00	\$3.00	\$3.00	\$3.00	\$6.00	\$6.00	\$6.00	\$6.00	\$6.00
Option 3B - Shaped	\$7.00	\$7.00	\$7.00	\$4.00	\$3.00	\$3.00	\$3.00	\$4.00	\$4.00	\$7.00	\$7.00	\$7.00

Tables 7, 8 and 9 on page 77 summarize system modeling results for expected energy adder Option 1A, 1B and 2A:

Table 7 Option 1A – Flat \$8/MWh Adder in Non-freshet months

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1473	kCAD
10th Percentile Net Revenue	-69	kCAD
50th Percentile Net Revenue	1457	kCAD
90th Percentile Net Revenue	3015	kCAD
Expected Incremental Load	264	GWh
10th Percentile Incremental Load	240	GWh
50th Percentile Incremental Load	270	GWh
90th Percentile Incremental Load	280	GWh

Table 8 Option 1B – Shaped Adder in Non-freshet months that averages \$8/MWh

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1445	kCAD
10th Percentile Net Revenue	-85	kCAD
50th Percentile Net Revenue	1436	kCAD
90th Percentile Net Revenue	2986	kCAD
Expected Incremental Load	263	GWh
10th Percentile Incremental Load	239	GWh
50th Percentile Incremental Load	268	GWh
90th Percentile Incremental Load	280	GWh

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Table 9 **Option 2A – Flat \$7/MWh Adder in Non-freshet months**

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1315	kCAD
10th Percentile Net Revenue	-257	kCAD
50th Percentile Net Revenue	1308	kCAD
90th Percentile Net Revenue	2881	kCAD
Expected Incremental Load	266	GWh
10th Percentile Incremental Load	243	GWh
50th Percentile Incremental Load	272	GWh
90th Percentile Incremental Load	282	GWh

On page 79 of the Application, BC Hydro also states:

BC Hydro's proposal in this application is to proceed with Option 2A, which uses a flat energy charge adder of \$7/MWh in non-freshet months and a flat \$3/MWh energy charge adder of \$3/MWh in freshet months. This option reflects AMPC's proposal and is generally consistent with customer feedback requesting simplicity in adder pricing.

- 1.22.1 Please explain the rationale for selecting Option 2A over both of Option 1A or 1B, when the alternatives appear to provide higher expected incremental load net revenue.

RESPONSE:

For expected incremental load net revenue, the difference between Option 2A and Option 1A is \$0.16 million and the difference between Option 2A and Option 1B is \$0.13 million.

The expected net revenue difference is a function of the energy charge adder applied to the forecast of incremental energy load in non-freshet months. More revenue is forecast to be collected with an energy charge adder of \$8/MWh than with an energy charge adder of \$7/MWh.

In the Application, BC Hydro sought to balance feedback from the Association of Major Power Customers (AMPC) and customers who requested that the energy charge adder be priced lower and that the adder price be flat (rather than shaped) across non-freshet months for simplicity.

BC Hydro proposed Option 2A in the Application in consideration of this feedback and the revenue differences between the modelled alternatives.

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22.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **ECONOMIC JUSTIFICATION AND RATEPAYER IMPACTS**
Exhibit B-1, pp. 76–80
Assessment of Energy Adder Alternatives

Table 6 on page 76 of the Application is shown below, and summarizes the six energy charge adder alternatives:

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ENERGY CHARGE ADDER ALTERNATIVES (\$/MWh)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Option 1A - Flat	\$8.00	\$8.00	\$8.00	\$8.00	\$3.00	\$3.00	\$3.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00
Option 1B - Shaped	\$9.00	\$9.00	\$9.00	\$6.00	\$3.00	\$3.00	\$3.00	\$6.00	\$6.00	\$9.00	\$9.00	\$9.00
Option 2A - Flat	\$7.00	\$7.00	\$7.00	\$7.00	\$3.00	\$3.00	\$3.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00
Option 2B - Shaped	\$8.00	\$8.00	\$8.00	\$5.00	\$3.00	\$3.00	\$3.00	\$5.00	\$5.00	\$8.00	\$8.00	\$8.00
Option 3A - Flat	\$6.00	\$6.00	\$6.00	\$6.00	\$3.00	\$3.00	\$3.00	\$6.00	\$6.00	\$6.00	\$6.00	\$6.00
Option 3B - Shaped	\$7.00	\$7.00	\$7.00	\$4.00	\$3.00	\$3.00	\$3.00	\$4.00	\$4.00	\$7.00	\$7.00	\$7.00

Tables 7, 8 and 9 on page 77 summarize system modeling results for expected energy adder Option 1A, 1B and 2A:

Table 7 Option 1A – Flat \$8/MWh Adder in Non-freshet months

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1473	kCAD
10th Percentile Net Revenue	-69	kCAD
50th Percentile Net Revenue	1457	kCAD
90th Percentile Net Revenue	3015	kCAD
Expected Incremental Load	264	GWh
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50th Percentile Incremental Load	270	GWh
90th Percentile Incremental Load	280	GWh

Table 8 Option 1B – Shaped Adder in Non-freshet months that averages \$8/MWh

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1445	kCAD
10th Percentile Net Revenue	-85	kCAD
50th Percentile Net Revenue	1436	kCAD
90th Percentile Net Revenue	2986	kCAD
Expected Incremental Load	263	GWh
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50th Percentile Incremental Load	268	GWh
90th Percentile Incremental Load	280	GWh

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Table 9 **Option 2A – Flat \$7/MWh Adder in Non-freshet months**

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1315	kCAD
10th Percentile Net Revenue	-257	kCAD
50th Percentile Net Revenue	1308	kCAD
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Expected Incremental Load	266	GWh
10th Percentile Incremental Load	243	GWh
50th Percentile Incremental Load	272	GWh
90th Percentile Incremental Load	282	GWh

On page 79 of the Application, BC Hydro also states:

BC Hydro's proposal in this application is to proceed with Option 2A, which uses a flat energy charge adder of \$7/MWh in non-freshet months and a flat \$3/MWh energy charge adder of \$3/MWh in freshet months. This option reflects AMPC's proposal and is generally consistent with customer feedback requesting simplicity in adder pricing.

- 1.22.2 Please explain why expected incremental load changes under each of the six energy adder scenarios (e.g. 263 GWh in Option 1B and 266 GWh in Option 2A) when only the energy charge adder is different in each scenario.

RESPONSE:

The adder changes the total RS 1893 price that the customer will see for incremental load. For example, when the adder is \$1/MWh higher, the RS 1893 energy price is \$1/MWh higher and vice versa.

In all six adder scenarios modelled, BC Hydro used a notional strike price of \$55/MWh to represent the price point at which the customer would curtail its incremental load to baseline levels.

When the total RS 1893 price is higher, due to a higher adder, the notional \$55/MWh strike price is triggered more often (i.e., the model assumes that the customer will self-curtail its incremental load to baseline levels on any day priced higher than \$55/MWh). Accordingly, a higher RS 1893 energy price will reduce expected incremental load and a lower RS 1893 energy price will increase expected incremental load.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 79 of the Application, BC Hydro states:

BC Hydro's proposal in this application is to proceed with Option 2A, which uses a flat energy charge adder of \$7/MWh in non-freshet months and a flat \$3/MWh energy charge adder of \$3/MWh in freshet months.

On page 80 of the Application, BC Hydro states:

For any day where market energy imports are deemed to serve incremental RS 1893 load, BC Hydro would see an approximate net revenue loss equal to the difference between the RS 1893 energy charge adder collected and the current US\$5.16 /MWh wheeling cost for delivery from the Mid-C market to the B.C. Border plus 1.9 per cent transmission losses deemed to be paid (converted to Canadian dollars daily). On days where the market price is negative, the revenue loss from deemed market imports would be reduced by the difference between the actual market price and the \$0/MWh floor price under RS 1893.

- 1.23.1 Please provide an Excel file that calculates the break-even price when market energy imports are used to serve RS 1893 load (i.e. net revenue loss equals zero) (i) during freshet months and (ii) during non-freshet months.

RESPONSE:

BC Hydro interprets this question to ask for the Mid-C market price that would result in no impact to the ratepayer under Condition No. 2 when imports are used to serve the RS 1893 load. Please refer to Attachment 1 to this IR response which contains a working Excel spreadsheet that provides examples.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 79 of the Application, BC Hydro states:

BC Hydro's proposal in this application is to proceed with Option 2A, which uses a flat energy charge adder of \$7/MWh in non-freshet months and a flat \$3/MWh energy charge adder of \$3/MWh in freshet months.

On page 80 of the Application, BC Hydro states:

For any day where market energy imports are deemed to serve incremental RS 1893 load, BC Hydro would see an approximate net revenue loss equal to the difference between the RS 1893 energy charge adder collected and the current US\$5.16 /MWh wheeling cost for delivery from the Mid-C market to the B.C. Border plus 1.9 per cent transmission losses deemed to be paid (converted to Canadian dollars daily). On days where the market price is negative, the revenue loss from deemed market imports would be reduced by the difference between the actual market price and the \$0/MWh floor price under RS 1893.

- 1.23.1 Please provide an Excel file that calculates the break-even price when market energy imports are used to serve RS 1893 load (i.e. net revenue loss equals zero) (i) during freshet months and (ii) during non-freshet months.
- 1.23.1.1 Please calculate the break-even exchange rate on days where the prevailing market price is negative.

RESPONSE:

BC Hydro interprets this question to ask for a calculation of the exchange rate that would result in no impact to the ratepayer when the Mid-C price is negative. Please refer to Attachment 1 to this IR response.

Note, an exchange rate that would result in no impact to the ratepayer can only be calculated when the Mid-C price is between -\$5.16 and \$0 due to the \$0/MWh price floor under RS 1893.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 79 of the Application, BC Hydro states:

BC Hydro's proposal in this application is to proceed with Option 2A, which uses a flat energy charge adder of \$7/MWh in non-freshet months and a flat \$3/MWh energy charge adder of \$3/MWh in freshet months.

On page 80 of the Application, BC Hydro states:

For any day where market energy imports are deemed to serve incremental RS 1893 load, BC Hydro would see an approximate net revenue loss equal to the difference between the RS 1893 energy charge adder collected and the current US\$5.16 /MWh wheeling cost for delivery from the Mid-C market to the B.C. Border plus 1.9 per cent transmission losses deemed to be paid (converted to Canadian dollars daily). On days where the market price is negative, the revenue loss from deemed market imports would be reduced by the difference between the actual market price and the \$0/MWh floor price under RS 1893.

1.23.2 Please explain how BC Hydro could mitigate the risk of low inflows in order to minimize net revenue losses associated with market energy imports.

RESPONSE:

Potential negative ratepayer impacts from serving RS 1892 and RS 1893 load could be mitigated by raising the energy charge adder.

The proposed adder pricing has been chosen because BC Hydro believes it to be low enough to encourage additional load and high enough that other ratepayers are not negatively impacted in most of the scenarios analyzed.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 79 of the Application, BC Hydro states:

BC Hydro's proposal in this application is to proceed with Option 2A, which uses a flat energy charge adder of \$7/MWh in non-freshet months and a flat \$3/MWh energy charge adder of \$3/MWh in freshet months.

On page 80 of the Application, BC Hydro states:

For any day where market energy imports are deemed to serve incremental RS 1893 load, BC Hydro would see an approximate net revenue loss equal to the difference between the RS 1893 energy charge adder collected and the current US\$5.16 /MWh wheeling cost for delivery from the Mid-C market to the B.C. Border plus 1.9 per cent transmission losses deemed to be paid (converted to Canadian dollars daily). On days where the market price is negative, the revenue loss from deemed market imports would be reduced by the difference between the actual market price and the \$0/MWh floor price under RS 1893.

1.23.3 Please explain how BC Hydro could mitigate exchange rate risks associated with transmission used to transport market energy imports from Mid-C to the BC Border.

RESPONSE:

BC Hydro manages U.S. foreign exchange risk on a company-wide basis. U.S. foreign exchange risk associated with specified items is managed within a Foreign Exchange (FX) Risk Limit, as identified in BC Hydro's Board-approved Treasury Risk Management Policy. The FX Risk Limit applies to a forward-looking 24-month timeframe and specified U.S. currency exposure items, and is managed using only the approved risk management products as outlined in the Policy.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On pages 80 to 81, BC Hydro states:

For any day where basin energy is deemed to serve incremental RS 1893 loads, the difference between the value of actual RS 1893 energy sales and BC Hydro's System Marginal Value would be used to determine the revenue gain or loss on that day. If system conditions are characterized by low reservoir levels and below average inflows, there would be a bias towards higher system marginal prices. In turn, this can lead to higher revenue losses if the marginal value of water in the system is higher than the Mid-C marginal energy prices (plus adder) used as a reference for RS 1893 pricing.

- 1.23.4 Please provide an Excel file that calculates the break-even price when basin energy is deemed to serve incremental RS 1893 load (i) during freshet months and (ii) during non-freshet months.

RESPONSE:

BC Hydro interprets this question to ask for the Mid-C market price that would result in no impact to the ratepayer when basin energy is used to serve RS 1893 load, also known as Condition No. 3.

Attachment 1 to this response contains the requested working Excel spreadsheet. The breakeven point also depends on the system marginal value, so it has been kept constant for the example provided.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On pages 80 to 81, BC Hydro states:

For any day where basin energy is deemed to serve incremental RS 1893 loads, the difference between the value of actual RS 1893 energy sales and BC Hydro's System Marginal Value would be used to determine the revenue gain or loss on that day. If system conditions are characterized by low reservoir levels and below average inflows, there would be a bias towards higher system marginal prices. In turn, this can lead to higher revenue losses if the marginal value of water in the system is higher than the Mid-C marginal energy prices (plus adder) used as a reference for RS 1893 pricing.

1.23.5 Please discuss explain how BC Hydro could mitigate the risk of low inflows in order to minimize net revenue losses associated with serving RS 1893 load with basin energy.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.23.2.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On pages 80 to 81, BC Hydro states:

For any day where basin energy is deemed to serve incremental RS 1893 loads, the difference between the value of actual RS 1893 energy sales and BC Hydro's System Marginal Value would be used to determine the revenue gain or loss on that day. If system conditions are characterized by low reservoir levels and below average inflows, there would be a bias towards higher system marginal prices. In turn, this can lead to higher revenue losses if the marginal value of water in the system is higher than the Mid-C marginal energy prices (plus adder) used as a reference for RS 1893 pricing.

- 1.23.6 Absent the IER Pilot, in the case where system conditions would be biased towards higher system marginal prices due to low reservoir levels and below average inflows, please discuss whether BC Hydro would choose to import market energy to conserve reservoir levels.

RESPONSE:

The decision to purchase energy from Powerex instead of generating more from the system storage depends on the Threshold Purchase Price under the Transfer Pricing Agreement relative to the price of electricity at Mid-C plus transmission costs plus losses.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On pages 80 to 81, BC Hydro states:

For any day where basin energy is deemed to serve incremental RS 1893 loads, the difference between the value of actual RS 1893 energy sales and BC Hydro's System Marginal Value would be used to determine the revenue gain or loss on that day. If system conditions are characterized by low reservoir levels and below average inflows, there would be a bias towards higher system marginal prices. In turn, this can lead to higher revenue losses if the marginal value of water in the system is higher than the Mid-C marginal energy prices (plus adder) used as a reference for RS 1893 pricing.

- 1.23.7 Please explain whether the optimal scenario to serve RS 1893 load would be when BC Hydro's System Marginal Value is lower than the Mid-C price. In your response, please explain under what conditions the System Marginal Value could be lower than the Mid-C price and provide a calculation in Excel format.

RESPONSE:

BC Hydro assumes that 'optimal scenario to serve RS 1893 load' is referring to conditions when other non-participating customers are not negatively affected. As a general statement, the RS 1893 load is expected, on average, to provide non-participating customers benefits while BC Hydro has an operational annual surplus of energy. As the annual surplus decreases, the benefit to non-participating customers will generally decrease, all else being equal.

In operations, the incremental load from RS 1893 would not be treated any differently than other customer load, and therefore BC Hydro does not attribute imports, exports or draft of system storage to any particular load.

The condition that provides the greatest benefit to non-participating customers is Condition No. 1, which typically occurs during the freshet. Non-participating customers would also benefit under Condition No. 3 when system marginal value is less than Mid-C plus the energy charge adder.

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Examples of when the system marginal price may be lower than the Mid-C price plus transmission costs on the BPA system include: (1) when the reservoirs are very high, such as after a high inflow period; or (2) when the market price temporarily spikes.

The system marginal values are an output from the Energy Studies, which are not conducted in a spreadsheet-based software and therefore BC Hydro cannot provide a calculation in Excel format.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 81, BC Hydro also states:

Another scenario that was described is a low inflow year with limited market energy available. This might occur, for example, where BC Hydro has to buy replacement energy from the market during a current period to help serve domestic load at some future period. There could be a net revenue loss if BC Hydro uses lower cost market energy to serve Incremental Energy Rate Pilot load in real time during a low market price period rather than storing that energy in large reservoirs for later domestic use during a higher market price period. This net revenue loss impact would be in addition to the adder potentially not covering the cost of wheeling described above. The net revenue loss impact will be greater if the future market energy import is priced higher than the freshet market energy import and will be lower if the future market energy import is priced lower than the freshet market energy import.

An additional scenario which could occur is if, in high load periods, BC Hydro has to reduce its sales of energy to market to serve Incremental Energy Rate Pilot load, there may be a revenue loss if the forgone export would have been at a higher price than the price of the Incremental Energy Rate. BC Hydro notes this risk may be low given the situation is more likely to occur during high priced periods, which may have lower customer participation as described in the final paragraph of section 5.2.

1.23.8 Please explain whether BC Hydro could purchase forward market energy to serve RS 1893 customers in future periods. Provide an example calculation that would demonstrate the net revenue or loss under this scenario.

RESPONSE:

BC Hydro operates its resources as an integrated portfolio to serve the domestic load. As such, any forward electricity purchases, such as under the proposed 2019 Letter Agreement with Powerex, would not be made to serve a specific load.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 81, BC Hydro also states:

Another scenario that was described is a low inflow year with limited market energy available. This might occur, for example, where BC Hydro has to buy replacement energy from the market during a current period to help serve domestic load at some future period. There could be a net revenue loss if BC Hydro uses lower cost market energy to serve Incremental Energy Rate Pilot load in real time during a low market price period rather than storing that energy in large reservoirs for later domestic use during a higher market price period. This net revenue loss impact would be in addition to the adder potentially not covering the cost of wheeling described above. The net revenue loss impact will be greater if the future market energy import is priced higher than the freshet market energy import and will be lower if the future market energy import is priced lower than the freshet market energy import.

An additional scenario which could occur is if, in high load periods, BC Hydro has to reduce its sales of energy to market to serve Incremental Energy Rate Pilot load, there may be a revenue loss if the forgone export would have been at a higher price than the price of the Incremental Energy Rate. BC Hydro notes this risk may be low given the situation is more likely to occur during high priced periods, which may have lower customer participation as described in the final paragraph of section 5.2.

1.23.9 Please provide an example calculation in Excel format that illustrates a net revenue loss from serving RS 1893 load during a low market price period rather than a higher market price period.

RESPONSE:

BC Hydro interprets this question to ask for examples of ratepayer impacts under Condition No. 3.

Attachment 1 to this response contains the requested Excel spreadsheet. In Attachment 1, when market prices plus the adder is less than the system marginal value, then there is a negative impact on the ratepayer. When the market price plus adder is greater than the system marginal value, then there is a benefit to the ratepayer.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: **INTRODUCTION**
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 81, BC Hydro also states:

Another scenario that was described is a low inflow year with limited market energy available. This might occur, for example, where BC Hydro has to buy replacement energy from the market during a current period to help serve domestic load at some future period. There could be a net revenue loss if BC Hydro uses lower cost market energy to serve Incremental Energy Rate Pilot load in real time during a low market price period rather than storing that energy in large reservoirs for later domestic use during a higher market price period. This net revenue loss impact would be in addition to the adder potentially not covering the cost of wheeling described above. The net revenue loss impact will be greater if the future market energy import is priced higher than the freshet market energy import and will be lower if the future market energy import is priced lower than the freshet market energy import.

An additional scenario which could occur is if, in high load periods, BC Hydro has to reduce its sales of energy to market to serve Incremental Energy Rate Pilot load, there may be a revenue loss if the forgone export would have been at a higher price than the price of the Incremental Energy Rate. BC Hydro notes this risk may be low given the situation is more likely to occur during high priced periods, which may have lower customer participation as described in the final paragraph of section 5.2.

1.23.10 Please explain how the freshet market energy imports affect the net revenue loss under the IER Pilot when market energy is imported in the future to serve load under the IER pilot.

RESPONSE:

As stated in BC Hydro's response to BCUC IR 1.23.7, BC Hydro does not attribute imports, exports or draft of system storage to any particular load.

When the price is low during the freshet, it is usually economic to import as much electricity as possible. In the event imports are limited by market depth or transmission constraints (i.e., imports are not limited by System Minimum Generation), then RS 1893 incremental load would be served from system storage. In this scenario the incremental load is either offsetting a future export, or will result in a future import. The expected value of the future import or export is reflected in the system marginal value, and the ratepayer impact is the difference between the system marginal value and the RS 1893 rate.

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 81, BC Hydro also states:

Another scenario that was described is a low inflow year with limited market energy available. This might occur, for example, where BC Hydro has to buy replacement energy from the market during a current period to help serve domestic load at some future period. There could be a net revenue loss if BC Hydro uses lower cost market energy to serve Incremental Energy Rate Pilot load in real time during a low market price period rather than storing that energy in large reservoirs for later domestic use during a higher market price period. This net revenue loss impact would be in addition to the adder potentially not covering the cost of wheeling described above. The net revenue loss impact will be greater if the future market energy import is priced higher than the freshet market energy import and will be lower if the future market energy import is priced lower than the freshet market energy import.

An additional scenario which could occur is if, in high load periods, BC Hydro has to reduce its sales of energy to market to serve Incremental Energy Rate Pilot load, there may be a revenue loss if the forgone export would have been at a higher price than the price of the Incremental Energy Rate. BC Hydro notes this risk may be low given the situation is more likely to occur during high priced periods, which may have lower customer participation as described in the final paragraph of section 5.2.

1.23.11 Please provide an example calculation in Excel that illustrates a net revenue loss resulting from forgone exports at prices higher than what can be sold at the IER Pilot rates.

RESPONSE:

Holding the daily Mid-C price constant, the Incremental Energy Rate load could not result in a net revenue loss from foregone exports on the same day. This is because the daily RS 1893 price (including adder) for a domestic sale is always higher than the daily delivered export price (net of transmission costs) for a market sale.

However, forgone export at a later date may occur as a result of the Incremental Energy Rate load. The value of this future forgone export is not known at the time

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of the IER load; however, the system marginal value incorporates the possibility of those future sales. Under this case there will be a net impact to the ratepayer if the system marginal value is higher than the RS 1893 rate when the Incremental Energy Rate load occurred. Please refer to Attachment 1 of this response for an Excel spreadsheet illustrating this second example.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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23.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

Reference: INTRODUCTION
Exhibit B-1, pp. 79–81
Risk Assessment – Market Imports and Low Inflows

On page 81, BC Hydro also states:

Another scenario that was described is a low inflow year with limited market energy available. This might occur, for example, where BC Hydro has to buy replacement energy from the market during a current period to help serve domestic load at some future period. There could be a net revenue loss if BC Hydro uses lower cost market energy to serve Incremental Energy Rate Pilot load in real time during a low market price period rather than storing that energy in large reservoirs for later domestic use during a higher market price period. This net revenue loss impact would be in addition to the adder potentially not covering the cost of wheeling described above. The net revenue loss impact will be greater if the future market energy import is priced higher than the freshet market energy import and will be lower if the future market energy import is priced lower than the freshet market energy import.

An additional scenario which could occur is if, in high load periods, BC Hydro has to reduce its sales of energy to market to serve Incremental Energy Rate Pilot load, there may be a revenue loss if the forgone export would have been at a higher price than the price of the Incremental Energy Rate. BC Hydro notes this risk may be low given the situation is more likely to occur during high priced periods, which may have lower customer participation as described in the final paragraph of section 5.2.

- 1.23.12 Please discuss what strategies BC Hydro could use to mitigate risks associated with using replacement energy in low market priced periods to serve load under the IER pilot.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.23.2.

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24.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 5.5.4, p. 79; *BC Clean Energy Act*,
Chapter 22, Part 1, Section 2
Hydrology Conditions and Energy Imports**

On pages 79 to 80 of the Application, BC Hydro states:

Based on the assumptions provided, for energy charge adder Option 2A:

- Expected incremental RS 1893 energy sales are 266 GWh per year and expected net revenue to BC Hydro is approximately \$1.3 million per year;
- At the 10th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue loss of approximately (\$0.3 million) or more for approximately 243 GWh of incremental energy sales; and
- At the 90th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue gain of approximately \$2.9 million or more for approximately 282 GWh of incremental energy sales.

The *BC Clean Energy Act* Part 1, Section 2, states BC's energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

- 1.24.1 Please discuss how the forecast incremental electricity consumption from the IER Pilot is expected to affect reservoir storage levels over the next 3 years.

RESPONSE:

RS 1893 energy sales are expected to have a negligible impact on reservoir elevations over the next three years. The expected sales of 266 GWh per year, shown in Table 9 on page 77 of the Application, is about 0.5 per cent of the expected load, and far less than the variation in system inflows.

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24.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 5.5.4, p. 79; *BC Clean Energy Act*,
Chapter 22, Part 1, Section 2
Hydrology Conditions and Energy Imports**

On pages 79 to 80 of the Application, BC Hydro states:

Based on the assumptions provided, for energy charge adder Option 2A:

- Expected incremental RS 1893 energy sales are 266 GWh per year and expected net revenue to BC Hydro is approximately \$1.3 million per year;
- At the 10th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue loss of approximately (\$0.3 million) or more for approximately 243 GWh of incremental energy sales; and
- At the 90th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue gain of approximately \$2.9 million or more for approximately 282 GWh of incremental energy sales.

The *BC Clean Energy Act* Part 1, Section 2, states BC's energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.24.2 Please discuss how BC Hydro expects the IER Pilot to affect BC Hydro's ability to be a net exporter of electricity.

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RESPONSE:

BC Hydro's surplus over the next three years is approximately 4,000 GWh under average water conditions.¹ The amount of energy sales under the IER Pilot is expected to be negligible compared with the average annual surplus and the annual variation in system inflow plus Independent Power Producer deliveries.

¹ As taken from BC Hydro's response to BCUC IR 1.15.3, as filed in its Fiscal 2020 to Fiscal 2021 Revenue Requirements Application.

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24.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
 Exhibit B-1, Section 5.5.4, p. 79; *BC Clean Energy Act*,
 Chapter 22, Part 1, Section 2
 Hydrology Conditions and Energy Imports**

On pages 79 to 80 of the Application, BC Hydro states:

Based on the assumptions provided, for energy charge adder Option 2A:

- Expected incremental RS 1893 energy sales are 266 GWh per year and expected net revenue to BC Hydro is approximately \$1.3 million per year;
- At the 10th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue loss of approximately (\$0.3 million) or more for approximately 243 GWh of incremental energy sales; and
- At the 90th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue gain of approximately \$2.9 million or more for approximately 282 GWh of incremental energy sales.

The *BC Clean Energy Act* Part 1, Section 2, states BC's energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

1.24.3 Please discuss how BC Hydro expects the IER Pilot to affect gross and net energy imports for the duration of the pilot.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.24.2.

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24.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 5.5.4, p. 79; *BC Clean Energy Act*,
Chapter 22, Part 1, Section 2
Hydrology Conditions and Energy Imports**

On pages 79 to 80 of the Application, BC Hydro states:

Based on the assumptions provided, for energy charge adder Option 2A:

- Expected incremental RS 1893 energy sales are 266 GWh per year and expected net revenue to BC Hydro is approximately \$1.3 million per year;
- At the 10th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue loss of approximately (\$0.3 million) or more for approximately 243 GWh of incremental energy sales; and
- At the 90th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue gain of approximately \$2.9 million or more for approximately 282 GWh of incremental energy sales.

The *BC Clean Energy Act* Part 1, Section 2, states BC's energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

- 1.24.4 Please discuss how BC Hydro expects the IER Pilot to affect the total percentage of electricity consumed in British Columbia coming from clean or renewable sources, for the duration of the pilot.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.10.3.

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24.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
 Exhibit B-1, Section 5.5.4, p. 79; *BC Clean Energy Act*,
 Chapter 22, Part 1, Section 2
 Hydrology Conditions and Energy Imports**

On pages 79 to 80 of the Application, BC Hydro states:

Based on the assumptions provided, for energy charge adder Option 2A:

- Expected incremental RS 1893 energy sales are 266 GWh per year and expected net revenue to BC Hydro is approximately \$1.3 million per year;
- At the 10th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue loss of approximately (\$0.3 million) or more for approximately 243 GWh of incremental energy sales; and
- At the 90th percentile, there is a 10 per cent chance that BC Hydro would see a forecast annual net revenue gain of approximately \$2.9 million or more for approximately 282 GWh of incremental energy sales.

The *BC Clean Energy Act* Part 1, Section 2, states BC's energy objectives, including the following:

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

(n)to be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia;

- 1.24.5 Please discuss how BC Hydro will ensure that BC's Energy Objectives (c) and (n) will be met in the future, considering the possibility of a low-inflow year in conjunction with expected incremental energy demand from the IER Pilot.

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RESPONSE:

With respect to Objectives (c) and (n), please refer to BC Hydro's response to BCUC IRs 1.10.3 and 1.24.2.

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25.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PROPOSAL
 Exhibit B-1, Section 5.4, p. 67
 RS 1893 Baseline Determination**

On page 67 of the Application, BC Hydro states:

For a Customer with at least two years of consumption history, the default period for determining HLH and LLH Baselines and Monthly Reference Demand will be the 365 days of BC Hydro's fiscal 2019.

Further on footnote 40 on page 67 of the Application, BC Hydro states:

Fiscal 2019 is the most recent fiscal year for which customers have a final Energy CBL [Customer Baseline] that has been filed with and approved by the BCUC. This will ensure alignment of RS 1893 energy baselines with the customer's annual Energy CBL determined in accordance with TS 74.

1.25.1 Please confirm or otherwise explain that Fiscal 2019 consumption data will be used for determining HLH, LLH Baselines and Monthly Reference Demand for customers that participate in the IER Pilot in any year of the proposed pilot period.

RESPONSE:

Confirmed. Fiscal 2019 consumption is the proposed default period for RS 1893 baseline determination. The conditions that might result in an alternate period being used for RS 1893 baseline determination, or for making RS 1893 baseline adjustments, are described in Special Condition Nos.7, 8 and 9 of RS 1893.

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25.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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1.25.2 Please explain whether BC Hydro also considers previous year's consumption to set the Energy CBL and Monthly Reference Demand under RS 1823 (and the comparable RS 1828, if applicable).

RESPONSE:

As applicable, BC Hydro considers the previous year's annual RS 1823 energy consumption in accordance with the criteria set out in TS 74 (CBL Determination Guidelines) for RS 1823 Initial Energy CBL determination (section 3 of TS 74) and for RS 1823 Annual Energy CBL Resets (section 4.3 of TS 74).

Customers served under RS 1828 do not have an RS 1823 Energy CBL, so the provisions of TS 74 do not apply.

There is no Monthly Reference Demand under RS 1823, RS 1828 or TS 74, so the consideration of previous year's consumption does not apply.

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25.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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1.25.2 Please explain whether BC Hydro also considers previous year's consumption to set the Energy CBL and Monthly Reference Demand under RS 1823 (and the comparable RS 1828, if applicable).

1.25.2.1 If confirmed, please explain why this is also appropriate for customers participating under RS 1893.

RESPONSE:

BC Hydro understands this question to relate to the interaction of baseline setting provisions as between RS 1893 and RS 1823.

RS 1893 service is only available to eligible RS 1823 and RS 1828 customers.

Since the participating customer must take firm service under RS 1823 to be eligible to take non-firm service under RS 1893, the provisions of TS 74 related to the RS 1823 Energy CBL will continue to apply. Please also refer to BC Hydro's responses to BCUC IR 1.25.2 and BCOAPO IR 1.39.2.

Further, Special Condition No. 9 of RS 1893 is intended to ensure that any RS 1823 Energy CBL adjustment requested by the customer under TS 74 will result in a matching adjustment to the customer's RS 1893 baselines.

Taken together, BC Hydro is of the view that it is appropriate to consider eligible baseline adjustment events (and previous year's consumption, where applicable) under both rates so as to ensure a fair, consistent and transparent outcome for BC Hydro and participant customers.

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26.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 3.4.2, pp. 35–36
10 MVA Minimum Size Threshold**

As part of its customer engagement for the IER Pilot, BC Hydro sought feedback for a 10 MVA minimum size threshold. BC Hydro stated its concerns as follows:

... BC Hydro was concerned that prospective new customers might acquire (or choose to locate at) existing customer brownfield sites with minimal historical consumption, such that the majority of new load might be taken under the Incremental Energy Rate rather than under RS 1823. Where any new load is not “truly incremental”, such that the load might reasonably be considered to have occurred in the absence of the Incremental Energy Rate Pilot, there would be a different electricity pricing and revenue outcome. To the extent that a revenue reduction arises, relative to RS 1823, this could lead to an under-recovery of BC Hydro’s fixed costs and negative impacts for ratepayers.

However, existing and prospective new customers did not support the 10 MVA minimum size threshold because such a threshold would exclude them being able to participate. BC Hydro submits that approximately 55 per cent of existing RS 1823 transmission service load customers would not meet the minimum 10 MVA threshold.

As an alternative, BC Hydro proposes to limit the volume of incremental energy made available to the customer under RS 1893 to a maximum level not to exceed two times their monthly baselines.

1.26.1 In light of the risks identified by BC Hydro pertaining to the under-recovery of fixed costs and negative impacts for ratepayers, please state the pros and cons for BC Hydro under two mitigation methods: (i) initial 10 MVA minimum threshold and (ii) setting the maximum level of energy available to customers. Compare and contrast the two methods with the objective of mitigating the identified risks.

RESPONSE:

Special Condition No. 11 under RS 1893 sets the maximum level of electricity available to customers under RS 1893. This limitation on RS 1893 usage was proposed as an alternative to a 10 MVA minimum size threshold after consultation with customers and AMPC. Both methods seek to mitigate the potential for load

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shifting between RS 1823 and RS 1893. The two methods are compared and contrasted below.

10 MVA Minimum Size Threshold

- This method would provide for a simple and transparent separation of firm and non-firm service. For prospective new customers, it would provide clarity as to the customer's minimum investment in new plant (i.e., 10 MVA) that would be subject to firm electricity service under RS 1823 before any incremental load would be eligible for non-firm service under RS 1893.
- However, for new customers, using a fixed threshold could result in all new load greater than 10 MVA being priced under RS 1893 rather than RS 1823. Depending on the size of the incremental load, this could result in a significant load shift for loads in excess of 10 MVA.
- In addition, the 10 MVA threshold would exclude approximately 55 per cent of existing RS 1823 customers with loads smaller than 10 MVA from participating. Existing RS 1823 customers provided clear feedback to BC Hydro that this approach would be unfair.
- BC Hydro also notes that no transmission service rate schedules have a minimum size threshold.

Limitation on RS 1893 usage

- The proposed limitation on RS 1893 usage (Special Condition No. 11 of RS 1893) would apply equally to all RS 1823 customers of any size.
- The proposed limitation on RS 1893 usage of 2.0 times historical electricity consumption is intended to enable a customer to optimize production capacity that is idle or under-utilized. For instance, the customer could re-start an idled production line, re-start a piece of shutdown equipment, add a production shift, curtail self-generation, or make more energy intensive product grades. In these circumstances, BC Hydro generally expects that the incremental load would be within the prescribed limitation.
- BC Hydro considers that the proposed limitation on RS 1893 usage will help to right-size the customer's baselines during the Billing Year if new load is more than double historical load.
- Limitation of RS 1893 usage also involves BC Hydro monitoring each customer's monthly energy use and making baseline adjustments, as applicable. This approach also assists BC Hydro to flag significant and/or unusual increases in RS 1893 energy use that would be assessed under Special Condition No. 8 of RS 1893 to ensure the customer's RS 1893

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baselines are set appropriately to reflect normal expected RS 1823 electricity usage.

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27.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 5.4, p. 66
RS 1893 as an Alternative to RS 1880 for Customers with
Self-Generation**

On page 66 of the Application, BC Hydro proposes that Customers with self-generation may elect to use RS 1893 as an alternative to RS 1880 for the instantaneous pick-up of load due to loss of self-generation. However, the Customer must choose one service or the other. There is no ability to switch back and forth between RS 1893 and RS 1880.

1.27.1 Please explain under what circumstances (e.g. financial and operational considerations) would a customer choose to remain in RS 1893 and not switch to RS 1880.

RESPONSE:

BC Hydro expects that a customer with self-generation would typically choose to remain with RS 1893 service and not switch to RS 1880 service under one or more of the following circumstances and in no specific order:

- **Where the applicable RS 1893 energy price is lower than the RS 1880 price during the period of generator curtailment;**
- **Where the RS 1893 Monthly Reference Demand reflects the customer's normal monthly site operations and electricity purchases from BC Hydro, net of normal monthly self-generation output used for self-supply;**
- **Where site operations staff prefer the certainty of managing site generation to a fixed Monthly Reference Demand under RS 1893, rather than a dynamic 30 minute HLH Reference Demand under RS 1880;**
- **Where the Period of Use for generator curtailment occurs in LLH;**
- **Where the Monthly Reference Demand under RS 1893 is lower than the HLH Reference Demand that would be determined under RS 1880 prior to the Period of Use;**
- **Where there is no expected risk of Energy CBL reset under TS 74 (whether on a unique site or aggregated site basis) by remaining with RS 1893 service; and**
- **To avoid cancellation of RS 1893 service for the remainder of the Billing Year pursuant to Special Condition No. 12 of RS 1893.**

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27.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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1.27.2 Please clarify what is BC Hydro's rationale to not allow customers to switch back and forth between RS 1893 and RS 1880.

RESPONSE:

BC Hydro's rationale is that the customer should not be allowed to switch back and forth between RS 1893 pricing and RS 1880 pricing for each event of generator curtailment, based on whichever service is priced lower during the Billing Year.

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28.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

**Reference: INCREMENTAL ENERGY RATE PILOT PROPOSAL
Exhibit B-1, Section 5.3, p. 61
Annual Monitoring and Evaluation**

On page 61 of the Application, BC Hydro proposes to conduct annual monitoring and prepare an evaluation report to consider the results and impacts of the rate in fall 2023 after the results for the initial period (January 1, 2020 to March 31, 2021) and three complete fiscal years (fiscal 2021, fiscal 2022 and fiscal 2023) are available.

BC Hydro indicates that this will provide time for BC Hydro to conduct further analysis and consultation regarding whether any changes to the rate should be made and whether it should be extended as a pilot or made a permanent rate.

1.28.1 Please clarify whether BC Hydro is proposing to file annual reporting regarding the IER Pilot or will the first evaluation report occur in fall 2023.

RESPONSE:

BC Hydro is proposing to file an evaluation report in fall 2023.

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28.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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BC Hydro indicates that this will provide time for BC Hydro to conduct further analysis and consultation regarding whether any changes to the rate should be made and whether it should be extended as a pilot or made a permanent rate.

1.28.1 Please clarify whether BC Hydro is proposing to file annual reporting regarding the IER Pilot or will the first evaluation report occur in fall 2023.

1.28.1.1 If BC Hydro is proposing to file annual reports, please indicate when BC Hydro will submit the first and subsequent filings and detail the information that is proposed to be included.

RESPONSE:

Not applicable. BC Hydro is not proposing to file annual reports.

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28.0 C. INCREMENTAL ENERGY RATE PILOT PROPOSAL

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BC Hydro indicates that this will provide time for BC Hydro to conduct further analysis and consultation regarding whether any changes to the rate should be made and whether it should be extended as a pilot or made a permanent rate.

1.28.1 Please clarify whether BC Hydro is proposing to file annual reporting regarding the IER Pilot or will the first evaluation report occur in fall 2023.

1.28.1.2 Please compare the proposed IER Pilot reporting timeframe against the previously approved Freshet Rate Pilot.

RESPONSE:

The proposed IER Pilot reporting time frame for the evaluation report is fall 2023.

The Freshet Energy Rate Pilot included: (i) preliminary evaluation reports for Year 1 in fall 2016 and for Year 2 in fall 2017; and (ii) a final evaluation report, including an evaluation of Year 3, in fall 2018. BC Hydro also included an evaluation report for Year 4, as Appendix E to the Application.

BC Hydro is of the view that a single final evaluation report filed in fall 2023 would be more useful for stakeholders since the results would be covering three full fiscal years of the pilot.

BC Hydro does not support annual reporting for the IER Pilot due to its resource intensity and low regulatory efficiency.

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BC Hydro indicates that this will provide time for BC Hydro to conduct further analysis and consultation regarding whether any changes to the rate should be made and whether it should be extended as a pilot or made a permanent rate.

1.28.2 Please state the key success measures of the IER Pilot in order to determine whether the IER Pilot should be continued, extended, made permanent, or terminated. Discuss each measure and indicate whether certain measures should be given more (or less) weight.

RESPONSE:

BC Hydro will use some of the same key success measures used in the Freshet Rate evaluations for the evaluation of the IER Pilot. These include:

- **Estimate of the costs and benefits of the IER Pilot. This will be determined on an overall ratepayer basis;**
- **Estimate of participant benefit based on the unit cost reduction of incremental electricity (and any other measures identified by participant customers);**
- **Estimate of incremental energy sales and revenue;**
- **Assessment of whether risk mitigation measures such as the energy charge adder were sufficient to protect non-participants from harm; and**
- **Assessment of customer participation and satisfaction regarding the rate.**

Please also refer to section 5.7 of the Application.

For the IER Pilot rate to continue, BC Hydro believes that ratepayers should not be harmed and that the rate meets customer needs. These factors will need to be

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assessed carefully in any decision to continue the rate. In addition, BC Hydro will need to engage with customers and stakeholders to inform this decision.

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BC Hydro indicates that this will provide time for BC Hydro to conduct further analysis and consultation regarding whether any changes to the rate should be made and whether it should be extended as a pilot or made a permanent rate.

1.28.3 Considering that the IER Pilot will end on March 31, 2024, please explain what process BC Hydro expects to undertake to determine whether the IER pilot should be continued, extended, made permanent, or terminated.

RESPONSE:

BC Hydro will need to review the results of the evaluation and undertake customer and stakeholder consultation to determine whether the IER Pilot should be continued, extended, made permanent, or terminated.

BC Hydro will file an application with the BCUC for approval if it intends to extend the IER Pilot or to make the rate permanent.

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BC Hydro indicates that this will provide time for BC Hydro to conduct further analysis and consultation regarding whether any changes to the rate should be made and whether it should be extended as a pilot or made a permanent rate.

1.28.3 Considering that the IER Pilot will end on March 31, 2024, please explain what process BC Hydro expects to undertake to determine whether the IER pilot should be continued, extended, made permanent, or terminated.

1.28.3.1 Will BC Hydro be seeking a BCUC review and decision by March 31, 2024 subsequent to BC Hydro filing its evaluation report in fall 2023? Does BC Hydro view that there will be sufficient time for such process?

RESPONSE:

BC Hydro is uncertain whether it would be seeking a BCUC review and decision by March 31, 2024 at this time. It will depend on the results of the IER Pilot evaluation and the timing of the customer and stakeholder engagement process.

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1.28.3 Considering that the IER Pilot will end on March 31, 2024, please explain what process BC Hydro expects to undertake to determine whether the IER pilot should be continued, extended, made permanent, or terminated.

1.28.3.2 Please propose a specific filing date for the evaluation report in fall 2023.

RESPONSE:

BC Hydro proposes a filing date for the evaluation report of December 13, 2023.

Fred James

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

bchydroregulatorygroup@bchydro.com

March 25, 2020

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

Dear Mr. Wruck:

**RE: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application – Freshet
Rate Component
Responses to BCUC Pre-filed Questions for Streamlined Review Process,
BCUC Staff and Interveners Information Request No. 2**

BC Hydro writes in response to Exhibit A-5 to provide its responses to the BCUC pre-filed questions for the Streamlined Review Process (**SRP**) and in compliance with BCUC Order No. G-49-20 (Exhibit A-6) to provide its responses to Round 2 information requests as follows:

Exhibit B-6	Responses to BCUC Pre-filed Questions for SRP
Exhibit B-6-1	Responses to BCUC Pre-filed Questions for SRP (Confidential Version)
Exhibit B-7	Responses to BCUC Staff Information Request No. 2
Exhibit B-8	Responses to Interveners Information Request No. 2

BC Hydro is filing our response to BCUC Pre-filed Question No. 3 confidentially with the BCUC. BC Hydro confirms that in each instance, 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 BCUC's Rules of Practice and Procedure.

March 25, 2020
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Transmission Service Market Reference-Priced Rates Application – Freshet Rate
Component
Responses to BCUC Pre-filed Questions for Streamlined Review Process, BCUC Staff
and Interveners Information Request No. 2

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

jc/ma

Enclosure

British Columbia Utilities Commission Questions for Streamlined Review Process Information Request No. 1.0 Dated: March 2, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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- 1.0 To date, how many customers have given notice to BC Hydro to enroll for the 2020 freshet period? How does the 2020 freshet period enrollment compare to the average historical participation?

RESPONSE:

BC Hydro has received notice from 24 participant sites in accordance with Special Condition 2 of RS 1892 to enrol for the 2020 freshet period. This compares with actual customer participation for each of the four years of the Freshet Rate Pilot as shown in the table below.

	Freshet Rate (RS 1892) participant customer sites				
Industry	Year 1	Year 2	Year 3	Year 4	Year 5
Pulp and Paper	9	9	8	8	1
Solid wood	12	12	12	11	11
Oil and Gas	6	6	6	4	4
Chemicals	3	4	4	3	2
Mining	6	10	13	9	3
Cement	1	1	1	1	1
Other	2	2	1	1	2
Total	39	44	45	37	24

BC Hydro considers that the number of RS 1892 customer participant sites for 2020 is lower than average historical participation for the following reasons:

- Sixteen customer sites have provided notice to take service under the Incremental Energy Rate Pilot (RS 1893) instead of RS 1892;
- The recent downturn in the forestry sector has reduced the number of customer sites that would be able to participate and consume incremental energy;
- Nine customer participant sites from previous years have opted not to participate in Year 5 (of which five of these sites are presently shutdown); and
- Year 5 includes two new customer participant sites for which 2020 will be their first year of participation under RS 1892.

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- 2.0 In response to BCUC information request (IR) 1.9.4, BC Hydro provides its rationale for not curtailing customers for economic reasons. How will all other BC Hydro ratepayers be protected in the absence of curtailment for economic reasons? What are the benefits (and to whom would they accrue) if the curtailment criteria include economic reasons?

RESPONSE:

BC Hydro's view is that the assessment of ratepayer risk for RS 1892 service should be based on the results across entire freshet periods, and across multiple freshet periods, rather than, for example, the results for a specific hour or day where the provision of RS 1892 might result in a deemed economic loss.

In the absence of curtailment for economic reasons, ratepayers are protected by setting the energy charge adder (currently \$3/MWh) and energy price floor (currently \$0/MWh) to a level that is expected to result in benefits to ratepayers. Further, and as stated in BC Hydro's response to MOVEUP IR 1.3.1, BC Hydro would be amenable to reviewing the rate after ten years to address potential future risks or changes that may arise.

BC Hydro's Freshet Rate Pilot did not consider economic interruption as part of its rate objectives, design or pricing. No specific modeling, analysis or consultation was conducted during the Pilot to define the prospective pricing, criteria and implementation mechanics for an economic interruption provision.

BC Hydro considers that the proposed RS 1892 design and pricing in the Application reflects a balanced approach to risk as between ratepayers and participant customers. The transfer of additional risk to participant customers, such as through the inclusion of economic interruption criteria, will reduce the attractiveness of RS 1892 which, in turn, may lead to reduced participation. This, in turn, would diminish the proven effectiveness of RS 1892 to help BC Hydro mitigate freshet period over-supply and provide ratepayer benefits.

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3.0 In response to BCUC IR 1.8.2, BC Hydro states that the 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition 1: Minimum Generation with Exports approximately [REDACTED] per cent of the time, Condition 2: Minimum Generation with Imports approximately [REDACTED] per cent of the time, and Condition 3: Higher Basin Generation on the Margin approximately [REDACTED] per cent of the time. What was the split of such conditions during Years 1 to 3 of the Freshet Rate Pilot?

RESPONSE:

This response is being filed in confidence with the BCUC because it contains commercially sensitive information.

British Columbia Utilities Commission Questions for Streamlined Review Process Information Request No. 4.0 Dated: March 2, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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- 4.0 Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?

RESPONSE:

In operations, service of RS 1892 load is not distinguished from service of all other customer load. BC Hydro does not attribute imports, exports or use of its generation resources to serve any particular load.

BC Hydro only assessed the use of imports or exports with respect to financial impacts of RS 1892 in the after-the-fact rate impact evaluation. For the purpose of the evaluation, BC Hydro determined, for each day, the marginal resource condition deemed to serve incremental RS 1892 load. This condition was then paired with the net daily volume of RS 1892 load and the applicable daily pricing to calculate the corresponding economic impact.

Reducing energy imports or using BC Hydro generation resources differently to serve load are not options to manage the potential for economic losses.

Under RS 1892, BC Hydro manages the risk of economic losses from market imports through the \$3/MWh energy charge adder and the \$0/MWh energy price floor as described below:

- Holding the Mid-C market energy price constant, BC Hydro will deem an economic loss for serving RS 1892 energy from market imports of approximately \$4/MWh. This represents the difference between the \$3/MWh energy charge adder collected (plus deferral account rate rider as applicable) and BC Hydro's cost of wheeling and 1.9 per cent transmission losses for delivery of market energy to the BC border of approximately \$7/MWh;¹ and
- On any day where the market price is negative, this \$4/MWh difference will be reduced by the difference between the actual (negative) market price and the \$0/MWh energy price floor under RS 1892.

BC Hydro considers the \$3/MWh energy charge adder and \$0/MWh energy price floor to be sufficient to manage the risk of economic losses over the entire freshet period and over multiple freshet periods.

¹ Based on average CAD/US exchange rate of 0.75.

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- 5.0 In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?

RESPONSE:

BC Hydro does not support a requirement that the Freshet Energy Rate be subject to suspension in the event of a high probability of economic losses, because of the additional costs such a process would impose on BC Hydro ratepayers. BC Hydro's view is that a more efficient and less costly process would be to review the Freshet Energy Rate at a fixed future date as discussed in BC Hydro's response to BCUC pre-filed Question No. 8.

Additional costs to ratepayers would arise from the consideration of whether to suspend service for a particular freshet period. The criteria and process to determine whether to suspend service would have to be implemented either by a predefined and generally accepted process, or through a BCUC proceeding. Absent these steps, the requirement to suspend service may be subject to controversy, customer complaints and reconsideration requests.

Developing and obtaining general acceptance of a predefined criteria and process for service suspension would require the identification of potential processes and criteria, analysis of their implementation costs and practicality, as well as customer and stakeholder consultation. Absent these steps, a process for service suspension may be impractical or costly to implement, and subject to complaints and controversy.

Undergoing a BCUC proceeding to assess in each year whether or not BC Hydro should be precluded from offering the Freshet Energy Rate service is another option to manage the potential for controversy associated with service suspension but would come at a cost to ratepayers. However such an approach would lack regulatory efficiency and result in additional legal and regulatory costs that would have to be recovered from BC Hydro ratepayers.

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6.0 In response to BCSEA IR 1.5.2, BC Hydro submits that the subtraction of implementation costs, and verified load shifting costs, from the estimated revenue gains for the entire period of the Freshet Rate Pilot would have provided a more accurate indication of net financial impact. However, BC Hydro does not have verified estimates of load shifting for Year 3 and 4 of the pilot and has not provided actual implementation costs for Year 4. To the extent possible, what is BC Hydro's best estimate of load shifting and implementation costs, and what is the corresponding financial impact for each of Years 3 and 4?

RESPONSE:

BC Hydro has expanded Table 10 of Appendix D to the Application to show Pilot implementation costs by year. BC Hydro notes that Year 4 implementation costs include an estimate of legal and regulatory costs related to this proceeding.

Implementation Cost Description	Year 1	Year 2	Year 3	Year 4	Totals
Freshet rate design / regulatory proceedings*	\$ 40,000	\$ -	\$ -	\$ 66,000	\$ 106,000
Customer and stakeholder engagement	\$ 30,000	\$ 15,000	\$ 20,000	\$ 15,000	\$ 80,000
Billing	\$ 20,000	\$ 10,000	\$ 30,000	\$ 10,000	\$ 70,000
Evaluation report preparation	\$ 25,000	\$ 5,000	\$ 10,000	\$ -	\$ 40,000
Total	\$ 115,000	\$ 30,000	\$ 60,000	\$ 91,000	\$ 296,000
<i>* Estimated legal and regulatory costs (including PACA awards) for this proceeding</i>					

BC Hydro has expanded Table 12 of Appendix D to the Application to provide a revised estimate of adjusted ratepayer benefit using the information available to us, which includes: (i) implementation costs for each year; (ii) the results of BC Hydro's assessment of load shifting for Year 1 and Year 2; and (iii) a revised forecast of load shifting impacts for Year 3. BC Hydro considers the adjusted ratepayer benefit for the Pilot to be in the order of \$3.2 million, excluding any adjustment for Year 4 load shifting impacts which have not been forecast or assessed.

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Ratepayer Benefit - Adjustment Description	Year 1 (\$,000)	Year 2 (\$,000)	Year 3 (\$,000)	Year 4 (\$,000)	Total (\$,000)
Preliminary ratepayer benefit	\$ 2,259	\$ 2,194	\$ 1,872	\$ (543)	\$ 5,782
Less implementation costs	\$ (115)	\$ (30)	\$ (60)	\$ (91)	\$ (296)
Less customer-reported load shift impact	\$ (32)	\$ -	\$ -	\$ -	\$ (32)
Less unexplained load variance impact	\$ -	\$ -	\$ -	\$ -	\$ -
Less natural load growth impact	\$ (470)	\$ (340)	\$ (205)	\$ -	\$ (1,015)
Less RS 1880 replacement service impact	\$ (233)	\$ (820)	\$ (220)	\$ -	\$ (1,273)
Adjusted Ratepayer Benefit*	\$ 1,409	\$ 1,004	\$ 1,387	\$ (634)	\$ 3,166
<i>*actuals for Year 1 and Year 2; REVISED forecast for Year 3 load shifting; insufficient information available for Year 4</i>					

BC Hydro has revised its forecast of load shifting impacts for Year 3 based on the application of professional judgment to readily available information. However, this revised forecast was not prepared using the detailed six-step analysis methodology described in section 3.1.7 of Appendix D to the Application. That analysis is complex and time-consuming and was not possible to complete within the requested timeframe.

BC Hydro has insufficient data and information to prepare a forecast of load shifting impacts for Year 4 at this time. BC Hydro considers that there is insufficient evidence to support a conclusion that load shifting impacts from any prior year would be appropriate to apply to Year 4.

British Columbia Utilities Commission Questions for Streamlined Review Process Information Request No. 7.0 Dated: March 2, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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7.0 Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?

RESPONSE:

To respond to this question, BC Hydro has defined the scenarios as follows:

- (i) Favourable water conditions are when annual inflows are at least 10 per cent higher (wetter) than average;
- (ii) Normal water conditions are when annual inflows are within +/-10 per cent of average; and
- (iii) Unfavourable water conditions are when annual inflows are at least 10 per cent lower (drier) than average.

Using the same modeling and assumptions as performed for BC Hydro's response to BCUC IR 1.7.1, over the 46 years of historical weather sequences used in the modeling, the expected annual financial impact on ratepayers is:

- (i) Favourable: \$547,000;
- (ii) Normal: \$34,000; and
- (iii) Unfavourable: -\$374,000.

BC Hydro notes that these conditions represent an average of expected annual outcomes only. Within each scenario, there can still be a range of outcomes. As the majority of inflow scenarios fall into the normal and favourable categories, BC Hydro considers that benefits to ratepayers will accrue when assessed over multiple years.

Further, BC Hydro notes that the modeled results are different from the actual results for the Pilot, whereby Year 1 (ratepayer impact of \$2,259,000), Year 2 (ratepayer impact of \$2,194,000) and Year 3 (ratepayer impact of \$1,872,000) would each be defined as 'normal' and Year 4 (ratepayer impact of -\$543,000) would be defined as 'unfavourable'. The model was intended to test reasonableness of the adder under a range of conditions. It was not primarily intended to provide a forecast of future revenues. Input assumptions to the model differ from the actual conditions of the past four years. As an example, the model assumed customer participation levels and incremental energy use to be approximately 50 per cent lower than was typically seen over the past four years. The model outcomes demonstrate that the adder results in positive net ratepayer benefits under most conditions.

British Columbia Utilities Commission Questions for Streamlined Review Process Information Request No. 8.0 Dated: March 2, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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- 8.0 In response to MoveUP IR 1.3.1, BC Hydro explains its proposal to not review the Freshet Rate earlier than ten years. How, if at all, will BC Hydro, BCUC and ratepayers ensure that the Freshet Rate remains economical for all ratepayers during this ten year period?

RESPONSE:

BC Hydro believes that a review in ten years time is a reasonable approach considering regulatory efficiency, ratepayer risk, and customer experience.

Undertaking more frequent reviews of the Freshet Energy Rate will result in costs that will have to be recovered from all ratepayers. A review in ten years is a reasonable period of time, given that BC Hydro's energy surplus in a planning view is expected to last at least ten years, and that conditions experienced over the last four years are likely to be within the range of conditions observed in the near and medium term.

Fred James

Chief Regulatory Officer

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March 25, 2020

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

Dear Mr. Wruck:

RE: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application – Freshet
Rate Component
Responses to BCUC Pre-filed Questions for Streamlined Review Process,
BCUC Staff and Interveners Information Request No. 2

BC Hydro writes in response to Exhibit A-5 to provide its responses to the BCUC pre-filed questions for the Streamlined Review Process (**SRP**) and in compliance with BCUC Order No. G-49-20 (Exhibit A-6) to provide its responses to Round 2 information requests as follows:

Exhibit B-6	Responses to BCUC Pre-filed Questions for SRP
Exhibit B-6-1	Responses to BCUC Pre-filed Questions for SRP (Confidential Version)
Exhibit B-7	Responses to BCUC Staff Information Request No. 2
Exhibit B-8	Responses to Interveners Information Request No. 2

BC Hydro is filing our response to BCUC Pre-filed Question No. 3 confidentially with the BCUC. BC Hydro confirms that in each instance, 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 BCUC's Rules of Practice and Procedure.

March 25, 2020
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Transmission Service Market Reference-Priced Rates Application – Freshet Rate
Component
Responses to BCUC Pre-filed Questions for Streamlined Review Process, BCUC Staff
and Interveners Information Request No. 2

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

jc/ma

Enclosure

British Columbia Utilities Commission Staff Information Request No. 2.A Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application – Freshet Rate Component	Exhibit: B-7

Enrollment and need

1.0 To date, how many customers have given notice to BC Hydro to enroll for the 2020 freshet period? How does the 2020 freshet period enrollment compare to the average historical participation?

2.A Is there a need for the Freshet Rate on a permanent basis? Given that the energy adders during the Freshet months (May, June, and July billing periods) are the same for the Freshet Rate and the Incremental Energy Rate (IER) Pilot, how many new and existing customers are going migrate away from the Freshet Rate?

RESPONSE:

BC Hydro's view is that it is in our customer and ratepayer interests to offer RS 1892 on an ongoing basis. Customers have through consultations with BC Hydro expressed their desire to have the rate made permanent.

Even though the energy charge adders are the same for RS 1892 and RS 1893 during the freshet period months of May through July, BC Hydro considers that some customers will still choose to take service under RS 1892 rather than migrate to RS 1893. Specifically, customers have provided feedback to BC Hydro that their decision to participate in either RS 1892 or RS 1893 is impacted by factors that include:

- The ability to increase load over the three months of the freshet period only, rather than over 12 months, including the resources required to manage site operations for incremental load based on daily price signals;
- The capability of their site operation to manage the prospective risk of interruption and market price exposure over only three months rather than over 12 months; and
- The use of seasonal baselines (three in total) with seasonal billing settlement under RS 1892 as opposed to monthly baselines (36 in total) and monthly billing settlement under RS 1893.

For the F2021 freshet period of May through July 2020, 24 customer sites provided notice of their intent to participate in RS 1892. This compares with 16 customer sites that provided notice of their intent to participate in RS 1893 for F2021. BC Hydro notes that COVID-19 impacts will likely have a negative impact on actual customer participation.

Please also refer to BC Hydro's response to BCUC pre-filed Question No. 1.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Enrollment and need

- 1.0 To date, how many customers have given notice to BC Hydro to enroll for the 2020 freshet period? How does the 2020 freshet period enrollment compare to the average historical participation?
- 2.B Has BC Hydro considered extending the Freshet Rate pilot to additional year(s) to monitor customer behaviour between the Freshet Rate and IER offerings?

RESPONSE:

As described in section 5.7 of the Application and in BC Hydro's response to BCSEA IR 1.9.2, BC Hydro intends for the scope of the RS 1893 evaluation to include an assessment of synergies between RS 1892 and RS 1893 and an assessment of the usage of RS 1893 compared to the usage of RS 1892 during the freshet period.

BC Hydro does not view an extension of RS 1892 as a pilot as being necessary for the purpose of making this assessment or for considering any potential changes to RS 1892 or RS 1893 that may arise from its outcome.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Curtailment criteria; economic impact; risk to ratepayers

2. In response to BCUC information request (IR) 1.9.4, BC Hydro provides its rationale for not curtailing customers for economic reasons. How will all other BC Hydro ratepayers be protected in the absence of curtailment for economic reasons? What are the benefits (and to whom would they accrue) if the curtailment criteria include economic reasons?
 3. In response to BCUC IR 1.8.2, BC Hydro states that the 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition 1: Minimum Generation with Exports approximately ■ per cent of the time, Condition 2: Minimum Generation with Imports approximately ■ per cent of the time, and Condition 3: Higher Basin Generation on the Margin approximately ■ per cent of the time. What was the split of such conditions during Years 1 to 3 of the Freshet Rate Pilot?
- 2.C. BC Hydro states that condition 1: Forced export will always have a net benefit to ratepayer. Condition 2: Market import will have a ratepayer loss unless the Mid-C price is sufficiently negative. Condition 3, where system storage is the marginal resource, 'Revenue gain (loss)' is a notional term as it is based on the difference between the RS 1892 Rate and the system marginal value at the time of incremental load. (Emphasis added, Exhibit B-4, BC Hydro response to BCUC IR 1.8.5)
- (i) Would market imports likely incur economic losses? How likely do Mid-C prices become negative?
 - (ii) Should the evaluation of ratepayer economic impact consider the **notional** Condition 3? Should condition 1 and 2 which appear to be actual economic gains/losses be given a different weight than condition 3 which appears to be an opportunity cost calculation?

RESPONSE:

- (i) **Condition 2 typically results in a deemed loss. Over the four years of the RS 1892 pilot, approximately 8 per cent of the price periods (where a price period refers to a period of heavy load hours or light load hours) had negative prices.**
- (ii) **It is not clear to BC Hydro what is being referred to in the question as a notional Condition 3. BC Hydro clarifies that all economic gains or losses,**

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regardless of Resource Condition, are deemed economic gains or losses calculated during the after-the-fact rate impact evaluation. As such, BC Hydro would not put a different weight to gains or losses depending on the Resource Condition. Please refer also to BC Hydro's response to BCUC pre-filed Question No. 4.

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Curtailment criteria; economic impact; risk to ratepayers

2. In response to BCUC information request (IR) 1.9.4, BC Hydro provides its rationale for not curtailing customers for economic reasons. How will all other BC Hydro ratepayers be protected in the absence of curtailment for economic reasons? What are the benefits (and to whom would they accrue) if the curtailment criteria include economic reasons?
 3. In response to BCUC IR 1.8.2, BC Hydro states that the 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition 1: Minimum Generation with Exports approximately ■ per cent of the time, Condition 2: Minimum Generation with Imports approximately ■ per cent of the time, and Condition 3: Higher Basin Generation on the Margin approximately ■ per cent of the time. What was the split of such conditions during Years 1 to 3 of the Freshet Rate Pilot?
- 2.D. One of BC Hydro's objectives for the Freshet Rate in the 2015 Rate Design Application was to assist in the management of the freshet oversupply in the BC Hydro system by providing the option to: (i) increase the ability to import cheap electricity during low priced periods; (ii) reduce the volume of surplus energy being forced to export markets; and/or (iii) reduce spill at BC Hydro facilities. (Exhibit B-1, PDF 235-236/512)
- (i) How does each of the three conditions (i.e. forced export, market import, and system storage as the marginal source) contribute or reflect the three options stated above to manage the freshet oversupply in BC Hydro's system?

RESPONSE:

Marginal Resource Condition 1, Minimum Generation with Forced Export, reflects option (ii) directly and option (iii) in cases where additional forced exports resulting from the lack of incremental load under RS 1892 are not possible (e.g., due to market depth).

Marginal Resource Condition 2, Minimum Generation with Economic Import, reflects option (i), albeit potentially at a financial loss due to the difference between the adder and the BPA transmission wheeling charge.

Marginal Resource Condition 3, Basin Generation on the Margin, has elements of all three options given incremental load under RS 1892 assists BC Hydro to manage Freshet Shapeable Energy via means other than market transactions or spill.

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Curtailment criteria; economic impact; risk to ratepayers

2. In response to BCUC information request (IR) 1.9.4, BC Hydro provides its rationale for not curtailing customers for economic reasons. How will all other BC Hydro ratepayers be protected in the absence of curtailment for economic reasons? What are the benefits (and to whom would they accrue) if the curtailment criteria include economic reasons?
 3. In response to BCUC IR 1.8.2, BC Hydro states that the 2019 year of the Freshet Rate Pilot had periods where the system was under marginal resource Condition 1: Minimum Generation with Exports approximately ■ per cent of the time, Condition 2: Minimum Generation with Imports approximately ■ per cent of the time, and Condition 3: Higher Basin Generation on the Margin approximately ■ per cent of the time. What was the split of such conditions during Years 1 to 3 of the Freshet Rate Pilot?
- 2.E Please provide BC Hydro's views if the BCUC's approval of the Freshet Rate application is condition upon BC Hydro including economic reasons in its curtailment criteria.

RESPONSE:

Please refer to BC Hydro's response to BCUC pre-filed Question No. 2.

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Adjustments and options to offer Freshet Rate

4. Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?
 5. In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?
- 2.F In 2019, when was BC Hydro able to make the assessment that low water conditions and high Mid-C prices would lead to an economic loss during the 2019 Freshet Period? Specify the month or date.

RESPONSE:

In February 2019 BC Hydro had sufficient information to make an assessment that the economic impact of RS 1892 would likely, but not with certainty, be an economic loss to ratepayers during the 2019 freshet period.

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Adjustments and options to offer Freshet Rate

4. Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?
 5. In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?
- 2.G What is BC Hydro's most current assessment of the water conditions and Mid-C prices for the 2020 Freshet Period and how that impacts the gains or losses during the 2020 Freshet season under Rate Schedule (RS) 1892, if it were to be offered?

RESPONSE:

Based on a current assessment of water conditions and prices, BC Hydro expects that the economic impact of offering RS 1892 for the 2020 freshet period has a higher probability of being a gain than a loss.

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Adjustments and options to offer Freshet Rate

4. Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?
 5. In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?
- 2.H Based on BC Hydro's most current assessment of the water conditions and Mid-C prices for the 2020 Freshet period, if BC Hydro can predict that adverse conditions exist that may lead to losses, what are some loss mitigation strategies that BC Hydro is able to adopt?

RESPONSE:

Please refer to BC Hydro's response to BCUC pre-filed Question No. 4.

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Adjustments and options to offer Freshet Rate

4. Recognizing the potential economic losses incurred by energy imports, in what ways can BC Hydro manage the potential economic losses in each year's freshet period (e.g. reduce energy imports to serve non-firm Freshet Rate, increase the energy adder, utilize BC Hydro generation resources, and/or other methods)?
 5. In Year 4 (2019) of the Freshet Rate Pilot, BC Hydro initially decided to not offer the Freshet Rate because of low water conditions and the possibility of high Mid-C prices. In response to stakeholder request, BC Hydro nonetheless proceeded to offer the Freshet Rate. Year 4 resulted in a loss to BC Hydro. When BC Hydro predicts that there is a high probability of economic losses due to unfavorable conditions, should BC Hydro be precluded from offering the Freshet Rate or not? Why or why not?
- 2.I Given BC Hydro's ability to predict economic gains/loss ahead of a Freshet Rate period, discuss the feasibility and pros/cons if BC Hydro is required to submit an annual plan prior to each Freshet Rate period for BCUC review and/or approval.

RESPONSE:

Please refer to BC Hydro's response to BCUC pre-filed Question No. 5.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Water conditions and sensitivity analysis

- 7 Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?
- 2.J Why did BC Hydro not conduct a sensitivity analysis (Exhibit B-4, BC Hydro response to BCUC IR 1.7.2)? What is the time and effort involved assuming the analysis is feasible? How is a sensitivity analysis different than BC Hydro's economic loss prediction analysis for the 2019 Freshet Rate?

RESPONSE:

BC Hydro did not conduct the sensitivity analysis for BCUC IR 1.7.2 due to time limitations. It has since done a sensitivity analysis in the response to BCUC pre-filed Question No. 7. Such analysis is approximately three to four days of work.

A sensitivity analysis based only on inflow conditions is different from a forward looking loss prediction analysis, which considers additional drivers such as customer participation and forecasts of market prices and system marginal values.

British Columbia Utilities Commission Staff Information Request No. 2.K Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Water conditions and sensitivity analysis

- 7 Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?
- 2.K With respect to the Enbridge incident (Exhibit B-4, BC Hydro response to BCUC IR 1.8.3), BC Hydro submits that it cannot quantify how much the event had an impact on the water conditions. How did BC Hydro identify that Enbridge is a contributing factor that impacted water conditions, and what was the test?

RESPONSE:

The Enbridge incident was a contributing factor to energy availability from the market and not a contributing factor to water conditions. BC Hydro identified that a restriction on gas availability would limit the ability for gas-fired generation to run, thus restricting availability of market energy.

British Columbia Utilities Commission Staff Information Request No. 2.L Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Water conditions and sensitivity analysis

- 7 Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?
- 2.L With respect to precipitation (Exhibit B-4, BC Hydro response to BCUC IR 1.7.4), have the 2019 actuals and forecast 2020 snowfall data been factored into the Freshet Rate analysis?

RESPONSE:

In its response to BCUC IR 1.7.3.1, BC Hydro noted that as of 2019, 46 weather sequences, covering the years 1973 to 2018, are used in its modelling. Given BC Hydro's Application was submitted prior to the end of 2019, BC Hydro could not add 2019 to these sequences. As such, the 2019 weather sequence information has not been factored into the analysis, in terms of increasing the number of modeled sequences from 46 to 47 with the inclusion of 2019.

However, the analysis did factor in the state of BC Hydro's system prior to the Application, so in that manner the 2019 actuals were embedded in the analysis. A forecast of snowfall for 2020 was also included in the analysis.

British Columbia Utilities Commission Staff Information Request No. 2.M Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Water conditions and sensitivity analysis

- 7 Please model and discuss scenarios of energy availability in the following scenarios: (i) favourable, (ii) normal, and (iii) unfavourable water conditions. For each of these scenarios, what is the likely financial impact on other ratepayers that flows from BC Hydro continuing to offer the Freshet Rate in each scenario?
- 2.M BC Hydro has net energy imports for F2019 and forecast F2020 (Exhibit B-4, BC Hydro response to BCUC IR 1.10.1 & 1.10.3). BC's Energy Objectives includes BC being a net exporter of electricity from clean or renewable resources. How does the Freshet Rate program impact BC's energy objectives to be a net exporter?

RESPONSE:

In average water conditions, BC Hydro has a significant surplus that will not be significantly affected by the volumes of energy sales under the Freshet Energy Rate. As such, until such time as BC Hydro no longer has a surplus larger than the volumes of sales under the Freshet Energy Rate, the Freshet Energy Rate has no material impact on the net export objective.

British Columbia Utilities Commission Staff Information Request No. 2.N Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Year 4 evaluation and future evaluation

6. In response to BCSEA IR 1.5.2, BC Hydro submits that the subtraction of implementation costs, and verified load shifting costs, from the estimated revenue gains for the entire period of the Freshet Rate Pilot would have provided a more accurate indication of net financial impact. However, BC Hydro does not have verified estimates of load shifting for Year 3 and 4 of the pilot and has not provided actual implementation costs for Year 4. To the extent possible, what is BC Hydro's best estimate of load shifting and implementation costs, and what is the corresponding financial impact for each of Years 3 and 4?
 8. In response to MoveUP IR 1.3.1, BC Hydro explains its proposal to not review the Freshet Rate earlier than ten years. How, if at all, will BC Hydro, BCUC and ratepayers ensure that the Freshet Rate remains economical for all ratepayers during this ten year period?
- 2.N During the ten year period, does BC Hydro do any internal monitoring of the Freshet Rate economic impacts? Does BC Hydro have any thresholds to modify or terminate the rate schedule?

RESPONSE:

BC Hydro does not plan to conduct analysis of ratepayer economic impacts of RS 1892 until its next review, which in our view should occur no earlier than ten years in the future.

BC Hydro's expectation is that conditions over the near to medium term are likely to fall within the range of conditions that were observed and evaluated over the past four years. As such, conducting ongoing analysis of the economic impacts of RS 1892 in the coming years is not expected to meaningfully expand the evidence and information on ratepayer economic impacts of RS 1892.

While BC Hydro does not have any thresholds to modify or terminate the rate schedule, we do periodically assess whether our existing rate schedules continue to serve our business and customer needs, and if not, we may apply to the BCUC for changes to a rate schedule. BC Hydro expects to adopt this approach for RS 1892. For example, we plan to assess synergies between RS 1892 and RS 1893 in the proposed RS 1893 Evaluation, and the outcome of that evaluation may inform an application to the BCUC to modify RS 1892.

British Columbia Utilities Commission Staff Information Request No. 2.O Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Year 4 evaluation and future evaluation

6. In response to BCSEA IR 1.5.2, BC Hydro submits that the subtraction of implementation costs, and verified load shifting costs, from the estimated revenue gains for the entire period of the Freshet Rate Pilot would have provided a more accurate indication of net financial impact. However, BC Hydro does not have verified estimates of load shifting for Year 3 and 4 of the pilot and has not provided actual implementation costs for Year 4. To the extent possible, what is BC Hydro's best estimate of load shifting and implementation costs, and what is the corresponding financial impact for each of Years 3 and 4?
 8. In response to MoveUP IR 1.3.1, BC Hydro explains its proposal to not review the Freshet Rate earlier than ten years. How, if at all, will BC Hydro, BCUC and ratepayers ensure that the Freshet Rate remains economical for all ratepayers during this ten year period?
- 2.O What is the regulatory burden to conduct evaluation reports every year? Are there any benefits for BC Hydro to make such evaluations annually, or under a less frequent time interval (e.g. once every two years)?

RESPONSE:

Total costs of preparing an evaluation report on ratepayer economics and answering information requests on it from three to five interveners may exceed \$100,000 as further described below. BC Hydro staff time is generally drawn from existing staff resources and is not considered to result in incremental costs, however additional staff time dedicated to RS 1892 related regulatory proceedings may result in BC Hydro needing to defer other work.

BC Hydro estimates that preparing and filing with the BCUC an evaluation report with scope limited to ratepayer economic analysis may require up to approximately four weeks Professional 4 level equivalent staff labour time. The F2021 Standard Labour Rate for four weeks Professional 4 level equivalent staff labour is \$17,705.

BC Hydro estimates that responding to information requests from three to five interveners on the report may require approximately eight weeks Professional 4 level equivalent staff labour time and result in participant award funding of \$50,000.

Repeated evaluation of RS 1892 over the near to medium term is not expected to meaningfully expand the evidence on range of ratepayer impacts.

BC Hydro notes that no existing rate schedules in our Electric Tariff are subject to an ongoing requirement of annual or biennial evaluation.

British Columbia Utilities Commission Staff Information Request No. 2.P Dated: March 12, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application - Freshet Rate Component	Exhibit: B-7

Year 4 evaluation and future evaluation

6. In response to BCSEA IR 1.5.2, BC Hydro submits that the subtraction of implementation costs, and verified load shifting costs, from the estimated revenue gains for the entire period of the Freshet Rate Pilot would have provided a more accurate indication of net financial impact. However, BC Hydro does not have verified estimates of load shifting for Year 3 and 4 of the pilot and has not provided actual implementation costs for Year 4. To the extent possible, what is BC Hydro's best estimate of load shifting and implementation costs, and what is the corresponding financial impact for each of Years 3 and 4?
 8. In response to MoveUP IR 1.3.1, BC Hydro explains its proposal to not review the Freshet Rate earlier than ten years. How, if at all, will BC Hydro, BCUC and ratepayers ensure that the Freshet Rate remains economical for all ratepayers during this ten year period?
- 2.P Please provide BC Hydro's views if the BCUC's approval of the Freshet Rate application is condition upon BC Hydro submitting annual evaluation reports.

RESPONSE:

BC Hydro does not support a requirement to submit annual evaluation reports for RS 1892.

Fred James

Chief Regulatory Officer

Phone: 604-623-4046

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bchydroregulatorygroup@bchydro.com

March 25, 2020

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

Dear Mr. Wruck:

**RE: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application – Freshet
Rate Component
Responses to BCUC Pre-filed Questions for Streamlined Review Process,
BCUC Staff and Interveners Information Request No. 2**

BC Hydro writes in response to Exhibit A-5 to provide its responses to the BCUC pre-filed questions for the Streamlined Review Process (**SRP**) and in compliance with BCUC Order No. G-49-20 (Exhibit A-6) to provide its responses to Round 2 information requests as follows:

Exhibit B-6	Responses to BCUC Pre-filed Questions for SRP
Exhibit B-6-1	Responses to BCUC Pre-filed Questions for SRP (Confidential Version)
Exhibit B-7	Responses to BCUC Staff Information Request No. 2
Exhibit B-8	Responses to Interveners Information Request No. 2

BC Hydro is filing our response to BCUC Pre-filed Question No. 3 confidentially with the BCUC. BC Hydro confirms that in each instance, 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 BCUC's Rules of Practice and Procedure.

March 25, 2020
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Transmission Service Market Reference-Priced Rates Application – Freshet Rate
Component
Responses to BCUC Pre-filed Questions for Streamlined Review Process, BCUC Staff
and Interveners Information Request No. 2

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

jc/ma

Enclosure

BCOAPO et al. Information Request No.2.42.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

42.0 Reference: Exhibit B-5, BCOAPO 1.32.1

RS 1892 Special Condition 1 states:

“BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 or 88 to provide Service under this Rate Schedule.”

2.42.1 The response to BCOAPO 1.32.1 suggests there is no assessment as to whether a customer’s incremental load under RS 1892 can be supplied without additional system reinforcements or capacity prior to the customer taking service under the rate. Please clarify if this is the case.

RESPONSE:

Confirmed. There is no formal assessment (such as a System Impact or Transmission Planning Study) of whether sufficient energy and capacity is available to serve a customer’s incremental load under RS 1892 in the absence of additional system reinforcements.

However, BC Hydro’s transmission rates administration staff are responsible to set the customer’s RS 1892 baselines, including Reference Demand, and review the customer’s estimate of expected incremental energy use provided in accordance with Special Condition 2 of RS 1892. These staff administer the customer’s Electricity Supply Agreement (ESA), oversee RS 1892 billing and have frequent interaction with real time operating staff. This provides visibility to the magnitude of incremental RS 1892 load relative to ESA Contract Demand.

Should a circumstance be identified, whereby BC Hydro is concerned that local transmission capacity might not be available, BC Hydro retains the discretion to refuse service in accordance with Special Condition 1 of RS 1892.

BCOAPO et al. Information Request No. 2.42.2 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

42.0 Reference: Exhibit B-5, BCOAPO 1.32.1

RS 1892 Special Condition 1 states:

“BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 or 88 to provide Service under this Rate Schedule.”

2.42.2 If so, is service only “refused” at the time that the customer’s actual load exceeds the system’s current capabilities (i.e., service to the customer would be interrupted)?

RESPONSE:

To date, no RS 1892 customer’s actual or expected load has exceeded current system capabilities. Please also refer to BC Hydro’s response BCOAPO IR 2.42.1.

BCOAPO et al. Information Request No.2.42.3 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

42.0 Reference: Exhibit B-5, BCOAPO 1.32.1

RS 1892 Special Condition 1 states:

“BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 or 88 to provide Service under this Rate Schedule.”

2.42.3 If not, please outline how BC Hydro ensures Special Condition 1 is met prior to the customer actually taking service under RS 1892.

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.42.1.

BCOAPO et al. Information Request No. 2.43.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 17, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

43.0 Reference: Exhibit B-5, BCSEA 1.8.1

The response states:

“A revenue forecast for the Freshet Energy Rate and Incremental Energy Rate was not part of BC Hydro’s Fiscal 2020 to Fiscal 2021 Revenue Requirements Application, although actuals for May 2019 were included in the Evidentiary Update to the Fiscal 2020 to Fiscal 2021 Revenue Requirements.”

- 2.43.1 What effect, if any, does the inclusion of the actuals for May 2019 have on the revenue requirement or required rate increase for F2020 in the current Fiscal 2020 to Fiscal 2021 Revenue Requirements Application?

RESPONSE:

Directionally, revenues received for RS 1892 service have the effect of reducing BC Hydro’s rate increases.

BCOAPO et al. Information Request No. 2.43.2 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

43.0 Reference: Exhibit B-5, BCSEA 1.8.1

The response states:

“A revenue forecast for the Freshet Energy Rate and Incremental Energy Rate was not part of BC Hydro’s Fiscal 2020 to Fiscal 2021 Revenue Requirements Application, although actuals for May 2019 were included in the Evidentiary Update to the Fiscal 2020 to Fiscal 2021 Revenue Requirements.”

2.43.2 If the Freshet Rate is made permanent, will BC Hydro include the revenue forecast for the Freshet Rate in future Revenue Requirement Applications?

RESPONSE:

BC Hydro is not obliged to build to serve non-firm RS 1892 load, and therefore this load is not included in our load or revenue forecasts.

BCOAPO et al. Information Request No. 2.44.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
Exhibit B-5, BCOAPO 1.29.2**

2.44.1 Prior to each Freshet Period (e.g. February of each year), is
BC Hydro able to readily forecast for what portion of the Freshet
Period each of the three Conditions will exist?

RESPONSE:

**Yes. BC Hydro is able to prepare a high-level forecast for what portion of the
freshet period each of the three Conditions will exist based on its forward-looking
estimates of Mid-C market prices, system marginal values and inflow conditions,
all of which are inherently uncertain.**

BCOAPO et al. Information Request No. 2.44.2 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
 Exhibit B-5, BCOAPO 1.29.2**

2.44.2 Prior to the Freshet Period, is BC Hydro able to readily forecast (using the most recent Mid-C price forecast) what its marginal cost for the Period will be under Conditions 1 and 2?

RESPONSE:

Yes. BC Hydro is able to forecast (using the most recent Mid-C price forecast) what its marginal cost for the period will be under Conditions 1 and 2.

BCOAPO et al. Information Request No. 2.44.3 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
Exhibit B-5, BCOAPO 1.29.2**

2.44.3 Prior to the Freshet Period, is BC Hydro able to readily forecast what the system marginal value for the Period will be under Condition 3?

RESPONSE:

Yes. Prior to the freshet period, BC Hydro is able to forecast what the system marginal value for the period will be under Condition 3.

BCOAPO et al. Information Request No. 2.44.4 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
Exhibit B-5, BCOAPO 1.29.2**

2.44.4 Following each Freshet Period, is BC Hydro able to readily determine for what portion of the Freshet Period each of the three Conditions actually existed?

RESPONSE:

Yes. Following each freshet period, BC Hydro is able to determine for what portion of the freshet period each of the three Conditions actually existed.

BCOAPO et al. Information Request No. 2.44.5 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
Exhibit B-5, BCOAPO 1.29.2**

2.44.5 Following each Freshet Period, is BC Hydro able to readily determine what its average system marginal costs/system values were for each of the three Conditions?

RESPONSE:

Yes. Following each freshet period, BC Hydro is able to determine what the average daily system marginal costs/system values were as applicable to each of the three Conditions.

BCOAPO et al. Information Request No. 2.44.6 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
 Exhibit B-5, BCOAPO 1.29.2**

2.44.6 Following each Freshet Period, would BC Hydro be able to produce a summary of the RS 1892 results in a format similar to that in Appendix E, Table 5.

RESPONSE:

Yes. Following each freshet period, BC Hydro is able to produce a summary of the RS 1892 results in a format similar to that in Appendix E, Table 5.

BCOAPO et al. Information Request No. 2.44.6.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
Exhibit B-5, BCOAPO 1.29.2**

2.44.6 Following each Freshet Period, would BC Hydro be able to produce a summary of the RS 1892 results in a format similar to that in Appendix E, Table 5.

2.44.6.1 If not, why not?

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.44.6.

BCOAPO et al. Information Request No. 2.44.6.2 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**44.0 Reference: Exhibit B-4, BCUC 1.11.1
Exhibit B-5, BCOAPO 1.29.2**

2.44.6 Following each Freshet Period, would BC Hydro be able to produce a summary of the RS 1892 results in a format similar to that in Appendix E, Table 5.

2.44.6.2 If yes, would BC Hydro be willing to commit to publicly releasing such results after each Freshet Period and what would be reasonable timeframe to allow for the preparation of such results?

RESPONSE:

Please refer to BC Hydro's response to BCUC Staff IR 2.O.

BCOAPO et al. Information Request No. 2.45.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

**45.0 Reference: Exhibit B-5, BCOAPO 1.11.1 and 1.11.2
Exhibit B-5, BCOAPO 1.35.1**

2.45.1 The response to BCOAPO 1.11.2 makes reference to three Applications made by BC Hydro for Transmission Service Freshet Energy Baselines and the subsequent Orders issued by the BCUC. The referenced Orders are posted on the BCUC's website. However, they do not provide the information requested and the Applications themselves do not appear to be "posted". Please provide a response to BCOAPO 1.11.2.

RESPONSE:

Refer to BC Hydro's public versions of the applications that were filed with the BCUC for calendar 2016, 2017 and 2018 and provided as Attachments 1, 2, and 3, respectively, to this IR response.



Tom A. Loski
 Chief Regulatory Officer
 Phone: 604-623-4046
 Fax: 604-623-4407
bchydroregulatorygroup@bchydro.com

May 11, 2016

Ms. Laurel Ross
 Acting Commission Secretary
 British Columbia Utilities Commission
 Sixth Floor – 900 Howe Street
 Vancouver, BC V6Z 2N3

Dear Ms. Ross:

**RE: British Columbia Utilities Commission (BCUC or Commission)
 British Columbia Hydro and Power Authority (BC Hydro)
 Rate Schedule (RS) 1892 – Transmission Service Freshet Energy Baselines
 Application (the Application)**

BC Hydro writes to the Commission to provide the following revised information that replaces the original information filed with the Application. An explanation for each of the revisions is provided below.

1. A clarification statement is added to BC Hydro's letter to Canfor Chetwynd regarding the prospective adjustment of RS 1892 baselines for the 2017 Freshet Period to reflect actual pellet plant load in the same manner contemplated for actual generator output. Reconciliation for actual project performance was discussed with the customer, but it was a BC Hydro oversight not to include this explanation in its original customer letter. The revised letter replaces the original letter contained in Appendix C-4.
2. An error was identified in the calculation of Nanaimo Forest Product's (Harmac Pacific) Reference Demand contained in Appendix C-5. BC Hydro has corrected this error and includes the corrected RS 1892 Baselines statement signed by the customer. This replaces the original statement contained in Appendix C-5.
3. BC Hydro includes further explanation in its letter to Tree Island regarding the proposed RS 1892 baselines adjustment to accommodate the targeted installation of the customer's DSM project in late June 2016. The revised letter replaces the original letter contained in Appendix C-7.
4. A black-lined version of Appendix D is included which contains the corrected Nanaimo Forest Product's (Harmac Pacific) Reference Demand.

BC Hydro confirms that copies of the revised customer letters have been sent to each customer. Please note that the revised information contains confidential customer information and is filed on a confidential basis with the Commission only and is not included in this public version of the filing.

May 11, 2016
Ms. Laurel Ross
Acting Commission Secretary
British Columbia Utilities Commission
Rate Schedule (RS) 1892 – Transmission Service Freshet Energy Baselines
Application (the Application)

Page 2 of 2

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Tom Loski
Chief Regulatory Officer

ac/rh

Enclosure

Copy to: BCUC Project No. 3698781 (2015 Rate Design Application) Registered
Intervener Distribution List.



Tom A. Loski

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

bchydroregulatorygroup@bchydro.com

April 29, 2016

CONTAINS CONFIDENTIAL INFORMATION

Ms. Laurel Ross
Acting Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Ross:

**RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Rate Schedule (RS) 1892 – Transmission Service Freshet Energy
Baselines Application (the Application)**

BC Hydro writes to the Commission to apply for approval of HLH Baselines, LLH Baselines and Reference Demands for specified customers served on the Rate Schedule (**RS**) 1823 – Transmission Service Stepped Rate and that have elected to participate in Year 1 of the RS 1892 – Transmission Service Freshet Energy (**Freshet Rate**) pilot program.

BC Hydro requests that the Commission grant approval by Friday, May 20, 2016 to provide the specified customers with certainty as to the HLH and LLH Baselines and Reference Demand that will be used to determine the proportions of electricity purchases billed under RS 1823 and RS 1892 during the 2016 Freshet Period beginning May 1, 2016, and to provide BC Hydro with the baselines required to bill these customers correctly and on a timely basis. BC Hydro has included comprehensive information with this Application to facilitate the Commission's review process and timely approval.

This Application includes the following appendices:

Appendix A contains a draft of the Commission Order BC Hydro is requesting.

Appendix B contains a copy of RS 1892.

Appendix C contains the following information for each of the seven customer accounts for which BC Hydro is requesting approval of alternative HLH and LLH Baselines and Reference Demands:



April 29, 2016
 Ms. Laurel Ross
 Acting Commission Secretary
 British Columbia Utilities Commission
 Rate Schedule (RS) 1892 – Transmission Service Freshet Energy
 Baselines Application (the Application)

Page 2 of 9

- A copy of the customer's initial unadjusted RS 1892 HLH and LLH Baselines and Reference Demand (RS 1892 Baseline statement pro forma);
- A copy of the customer's request to BC Hydro for RS 1892 baseline adjustment;
- A copy of BC Hydro's response to the proposed RS 1892 baseline adjustment; and
- A copy of the signed RS 1892 Baselines statement to confirm agreement.

There is one outstanding customer RS 1892 Baselines statement. The customer – Tree Island Industries – has indicated by email that they agree with the adjusted Baselines and will provide the signed document early next week. BC Hydro will file this missing document with the Commission by Tuesday May 3, 2016.

Appendix D contains a list of the specific HLH Baselines, LLH Baselines and Reference Demands for which BC Hydro is requesting approval.

Appendices C and D contain confidential customer information and are filed on a confidential basis with the Commission only. A public version of the Application is filed under separate cover.

Application

In this Application, BC Hydro seeks Commission approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, of the HLH Baselines, LLH Baselines and Reference Demands contained in Appendix D.

The RS 1892 Freshet Rate requires that BC Hydro determine HLH and LLH Baselines and a Reference Demand, as these terms are defined in RS 1892, for each participating customer. BC Hydro will use these Baselines and Reference Demand, in accordance with RS 1892, to determine the amounts of energy and demand to be charged to participating customers under the RS 1823 Transmission Service Stepped Rate and the RS 1892 Freshet Rate.

A complete copy of the RS 1892 Freshet Rate is provided in Appendix B. The RS 1892 provisions used in determining the baselines and Reference Demand are repeated below for convenience:

“HLH Baseline” means the Customer's average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period;

“LLH Baseline” means the Customer's average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period;



April 29, 2016
 Ms. Laurel Ross
 Acting Commission Secretary
 British Columbia Utilities Commission
 Rate Schedule (RS) 1892 – Transmission Service Freshet Energy
 Baselines Application (the Application)

Page 3 of 9

“Reference Demand” means the average of the highest kV.A Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.

Special condition 4 of RS 1892 provides as follows:

“If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer’s expected RS 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.”

In addition, at the Commission’s Streamlined Review Process for the RS 1892 Freshet Rate held on January 25, 2016 BC Hydro confirmed that it would apply to the Commission for approval of any alternative HLH and LLH Baselines and Reference Demands.

A total of 57 unique RS 1823 customer sites notified BC Hydro by March 1, 2016 of their election to take electricity under the RS 1892 Freshet Rate during the 2016 Freshet Period. 12 customer sites have since rescinded their election, leaving a balance of 45 participant customer sites in Year 1 of the pilot. Of these, seven customer sites have requested adjustments to their LLH and HLH Baselines and/or Reference Demand. The following section outlines the process which BC Hydro determined RS 1892 baselines and Reference Demand for participant customers and the process used by BC Hydro to review and verify adjustment requests in accordance with Special Condition 4.

BC Hydro Baseline Determination Process

The following process was used to notify participant customers of the HLH and LLH Baselines and Reference Demand determined for their account, calculated in accordance with the definitions above.

BC Hydro provided an RS 1892 Baseline Statement pro forma (refer to Appendix C) together with a covering email to each participant customer in late March 2016. The pro forma sets out the HLH baseline, LLH Baseline and Reference Demand for RS 1892 purposes as determined by BC Hydro in accordance with the RS 1892 definitions quoted above.

The pro-forma includes total HLH and LLH energy volumes for the 2015 Freshet Period and a chart of the overall load profile. It also includes summary information from the



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customer's RS 1823 invoices for each of May, June and July 2015 to help customers audit the information against their own records.

HLH and LLH Baselines

BC Hydro established HLH and LLH Baselines for each participant customer site using hourly energy consumption data from its billing system for the period 00:00 hrs on May 1, 2015 to 24:00 hrs on July 31, 2015. There is a total of 2,208 hours in the 2015 Freshet Period. The data was separated into HLH and LLH periods, which reflect 1,232 hours and 976 hours, respectively. The 2015 Freshet Period HLH energy volume (in kWh) was divided by 1,232 hours to determine the HLH Baseline (in kWh.hr). The 2015 Freshet Period LLH energy volume (in kWh) was divided by 976 hours to determine the LLH Baseline (in kWh.hr). To verify the accuracy of each participant customer's 2015 Freshet Period energy consumption data, BC Hydro staff manually compared the RS 1892 pro-forma energy summary with billed energy from RS 1823 invoices for the May, June and July 2015 Billing Periods. Minor variances reflect differences in a customer billing cycle that starts/ends on the 21st or the 26th of each month (rather than the start/end of the month) and/or the time stamp of invoiced data. These variances were explained to participant customers, as applicable.

Also, for participant customers with self-generation, hourly energy consumption data from BC Hydro's billing system does not distinguish between RS 1823 energy volumes and RS 1880 energy volumes. Accordingly, BC Hydro staff identified RS 1880 energy volumes from RS 1823 invoices for the 2015 Freshet Period and manually adjusted (reduced) the period HLH energy volume by this amount. No adjustment to the period LLH energy volume was required because the determination of RS 1880 energy is specific to HLH.

Reference Demand

Reference Demand was determined as the average of the highest kV.A demand during HLH in each of May, June and July 2015. For most participant customers, the highest kV.A demand in these months is the same as Billing Demand per the customer's monthly RS 1823 invoice.

Where the customer's Billing Demand under RS 1823 reflected a ratchet demand calculated on the basis of: (a) 50 per cent of Contract Demand; or (b) 75 per cent of the prior winter peak Billed Demand, the actual peak kV.A demand for the customer sites was used. This approach was typically required in circumstances where the participant customer site was shut down during the 2015 Freshet Period.



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BC Hydro Baseline Review and Adjustment Process

BC Hydro requested that customers review the RS 1892 Baseline Statement carefully to confirm that it matched their invoices and was considered representative of expected normal electricity usage during the 2016 Freshet Period. BC Hydro staff made themselves available by email, telephone and in-person meetings to review the RS 1892 Baseline information with participant customers, to discuss prospective actions and estimated take-up volumes, and to consider prospective baseline adjustments where the customer had indicated the 2015 pro forma information was not representative of expected normal electricity usage during the 2016 Freshet Period.

The following process was used to review and verify the seven requests for adjustment to the RS 1892 Baselines.

1. Meetings were held between customer representatives and BC Hydro staff to discuss the nature of the prospective adjustment and its reasonableness.
2. Where a prospective customer baseline adjustment was confirmed as being reasonable, BC Hydro provided the customer with an email summary identifying the required information to be submitted, as set out below:
 - (a) Please submit a formal request by email or letter to your Key Account Manager pursuant to Special Condition 4 of RS 1892.
 - (b) The request should outline the specific HLH / LLH energy adjustment (and resultant alternative baselines) or Reference Demand adjustment that you are requesting.
 - (c) Please include any high-level rationale/calculations/documentation to support your request.
 - (d) BC Hydro will review your request for reasonableness with the intent to establish agreement for the proposed alternative HLH and LLH baselines.
 - (e) Subsequently, BC Hydro will file any such “agreed to” baselines with the Commission for approval prior to use for RS 1892 billing.
3. BC Hydro staff subsequently reviewed the customer submission and requested additional supporting information where required. Historical information from the 2013 and 2014 Freshet Periods was considered, as applicable. The intent of this review was to confirm that the adjustment request is reasonable and supported by technical and/or contractual information.
4. BC Hydro sent a letter to each customer to explain the review that was conducted and advise agreement with the customer’s adjustment request, subject to review and approval by the Commission.
5. An adjusted RS 1823 Baseline Statement was prepared for customer review and signature to reflect the agreed-to alternative HLH and LLH Baselines and/or Reference Demand.



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Summary of Customer Adjustments

The following summarizes the nature and rationale of the adjustments proposed by the customer and agreed to by BC Hydro for each of the seven customer accounts. Specific details of the adjustments are filed on a confidential basis in Appendix C. As described above, the seven customers have been informed that the agreed-to alternative HLH and LLH Baselines and Reference Demands remain subject to Commission approval.

Catalyst Paper Corp. (Crofton)

The Crofton site experienced a forced shutdown during the 2015 Freshet Period arising from the failure of its oxygen plant which is not expected to recur during the 2016 and 2017 Freshet Periods. Catalyst requested an adjustment (increase) to remove the impact of this event from its RS 1892 HLH and LLH Baselines. No Reference Demand adjustment was requested as the event did not impact peak kV.A demand. BC Hydro reviewed historical data from the 2014 and 2013 Freshet Periods and considers the requested adjustments to be consistent with historical and expected future operations during the Freshet Period.

Catalyst Paper Corp. (Port Alberni)

The Port Alberni site took a market curtailment during the 2015 Freshet Period due to poor market demand and high product inventories. Catalyst advised that the market curtailment is not expected to recur during the 2016 Freshet Period. Catalyst requested an adjustment (increase) to remove the impact of this event from its RS 1892 HLH and LLH Baselines. No Reference Demand adjustment was requested as the event did not impact peak kV.A demand. BC Hydro reviewed historical data from the 2014 and 2013 Freshet Periods and considers the requested adjustments to be consistent with historical and expected future operations during the Freshet Period.

Catalyst Paper Corp. (Powell River)

The Powell River site has invested in upgrades to its electrical power generation facilities pursuant to a Load Displacement Agreement (LDA) with BC Hydro which achieved commercial operations in November 2015. The LDA specifies a volume of incremental self-generation output that, when represented on an average hourly basis, will proportionately reduce Catalyst's take of RS 1823 electricity from BC Hydro. BC Hydro has confirmed that the generation facilities were not operating for LDA purposes during the 2015 Freshet Period. Catalyst requested an adjustment (decrease) to its RS 1892 HLH and LLH Baselines and Reference Demand to reflect the impact of incremental LDA self-generation going forward. BC Hydro has confirmed that the



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request is consistent with Catalyst's contractual obligations under its LDA and that a fixed hourly increase in generation output reflects the best available estimate of project performance during the 2016 Freshet Period.

Skookumchuck Pulp Inc. (SPI)

The Skookumchuck pulp mill in Chetwynd experienced a major planned outage of its electrical generating plant during the 2015 Freshet Period. This generator outage increased RS 1823 electricity purchases to an extent that is not considered representative of normal mill operations. SPI proposed that BC Hydro use replacement data from either the 2013 or 2014 Freshet Periods to determine its HLH and LLH Baselines and Reference Demand. BC Hydro reviewed this data and is of the view that there is no material difference as between the 2013 and 2014 Freshet Periods. BC Hydro considers the 2014 Freshet Period to be a more representative baseline of expected RS 1823 electricity use during the 2016 and 2017 Freshet Periods as it is the next most recent period relative to the otherwise applicable 2015 Freshet Period.

Harmac Pacific - Nanaimo Forest Products (NFP)

The Harmac pulp mill in Nanaimo experienced a major planned outage of its electrical generating plant during the 2015 Freshet Period. This generator outage increased RS 1823 electricity purchases to an extent that is not considered representative of normal mill operations. NFP proposed that BC Hydro use replacement data from certain months of the 2014 Freshet Period to determine its HLH and LLH Baselines and Reference Demand. BC Hydro reviewed this information and is of the view that it is more appropriate to replace 2015 Freshet Period data with 2014 Freshet Period data. BC Hydro considers the 2014 Freshet Period to be a more representative baseline of expected RS 1823 electricity use during the 2016 and 2017 Freshet Periods as it is the next most recent period relative to the otherwise applicable 2015 Freshet Period.

Tree Island Industries

The Tree Island site expects to complete the installation and commissioning of a BC Hydro-incented air compressor upgrade project in late June 2016. Tree Island requested an adjustment (decrease) to its RS 1892 HLH and LLH Baselines to reflect the expected impact of this project on future RS 1823 energy purchase. No Reference Demand adjustment was requested as the project is not deemed to impact peak kW.A demand. BC Hydro considers that the impact of this discrete energy conservation measure should be reflected in Tree Island's RS 1892 Baselines for the 2016 and 2017 Freshet Periods.



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Canfor Chetwynd

Canfor recently installed: (1) a new electrical power generating plant pursuant to a Load Displacement Agreement (LDA) with BC Hydro; and (2) a new pellet plant both of which are located behind the BC Hydro revenue meter of its Chetwynd sawmill. BC Hydro has confirmed that neither of these plants operated during the 2015 Freshet Period. The LDA specifies a volume of incremental self-generation output that will proportionately reduce Canfor's take of RS 1823 electricity from BC Hydro. Accordingly, Canfor requested a downwards adjustment (reduction) to its HLH and LLH Baselines to reflect the expected operation of its new generating plant. Canfor also requested an upwards baseline adjustment (increase) to its HLH and LLH Baselines to reflect the expected operation of its new pellet plant. Canfor did not request a Reference Demand adjustment on the premise that the expected load increase from the pellet plant would be offset by generator output during any 30 minute interval used to determine peak kW.A demand under RS 1823. BC Hydro has reviewed the information supplied by Canfor and considers the requested adjustments and estimation methodologies proposed to reflect a reasonable estimate of generator and pellet plant performance during the 2016 Freshet Period.

Request for Confidentiality of Customer Information

Appendix C of this Application provides the customer's actual 2015 freshet period electricity consumption data, and information about the customer's projects and operations that are the basis for adjusting the RS 1892 baselines. This includes detailed information about customer-specific plant capacity changes, operating changes and conservation and self-generation projects and contracts. Appendix D provides the customer's expected normal electricity usage during the Freshet Period.

Customers consider this information to be commercially sensitive and confidential because competitors could use it to estimate the customer's production levels, cost of production and efficiency. BC Hydro consistently treats this customer information as confidential. Accordingly, pursuant to section 18 of the Commission's Rules of Practice and Procedure (attached to Order No. G-1-16), BC Hydro requests that the Commission treat Appendices C and D as confidential.

The public version of this Application does not include redacted versions of Appendices C and D; instead, the section above provides non-confidential summaries of the confidential information.

Copies of the Application are being distributed to the customers for whom BC Hydro is applying for approval of adjusted baselines, but each customer will be provided with only the information in the appendix that relates to their account and not the information that relates to other customer accounts.

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For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



(for) Tom Loski
Chief Regulatory Officer

ac/rh

Enclosure

Copy to: BCUC Project No.3698781 (2015 Rate Design Application) Registered
Intervener Distribution List.



BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix A

Draft Order

Appendix A



British Columbia
Utilities Commission

Sixth floor, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
TEL: (604) 660-4700
BC Toll Free: 1-800-663-1385
FAX: (604) 660-1102

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)
Rate Schedule 1892 Transmission Service Freshet Baseline Application (the Application)

BEFORE:

Commissioner
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. On September 24, 2015, British Columbia Hydro and Power Authority (BC Hydro) filed with the British Columbia Utilities Commission (Commission) the first module of a rate design application (2015 RDA);
- B. Among the various approvals sought in the 2015 RDA, BC Hydro sought approval for a new optional rate schedule (RS) 1892 Freshet Rate, which provides participating customers market pricing for incremental consumption during the May to July freshet period on a pilot basis ending December 31, 2017;
- C. The Commission held a Streamlined Review Process (SRP) on January 25, 2016 for the RS 1892 Freshet Rate.
- D. By Order No. G-17-16 dated February 9, 2016 the Commission approved the RS 1892 Freshet Rate effective the date of the Order;
- E. The RS 1892 Freshet Rate requires that BC Hydro determine a “HLH Baseline”, “LLH Baseline” and “Reference Demand”, as defined in RS 1892, for each participating customer. BC Hydro will use these baselines and Reference Demand, in accordance with RS 1892, to determine the amounts of energy and demand to be charged under the RS 1823 Transmission Service Stepped Rate and the RS 1892 Freshet Rate, respectively;
- F. Special condition 4 of the RS 1892 Freshet Rate provides as follows:

“If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer’s expected RS 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand

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Appendix A

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with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.”

- G. At the SRP for the RS 1892 Freshet Rate BC Hydro confirmed that it would apply to the Commission for approval of any alternative LLH Baseline, HLH Baseline or Reference Demand;
- H. On April 29, 2016 BC Hydro filed with the Commission alternative LLH and HLH Baselines and Reference Demands for seven of the 45 customers that have elected to participate in year one of the RS 1892 Freshet Rate, and requested the Commission approve the alternative baselines and Reference Demands (Application);
- I. The Application includes evidence explaining why the LLH and HLH Baselines and Reference Demand calculated in accordance with the provisions of RS 1892 are not representative of the Customer’s expected RS 1823 electricity usage during the freshet period of 2016 or 2017, how the alternative baselines and Reference Demands were calculated, and that the seven customers agreed to the alternative baselines and Reference Demands;
- J. BC Hydro filed a public and a confidential version of the Application. In accordance with the Commission’s Rules of Practice and Procedures, Part IV, section 18, BC Hydro is requesting that Appendices C and D of the Application be held in confidence as they contain information that is commercially sensitive to the seven customers;
- K. BC Hydro requests the Commission grant approval by Friday, May 20, 2016 to provide the seven customers with certainty as to the LLH and HLH Baselines and Reference Demand that will apply during the freshet period beginning May 1, 2016; and
- L. The Commission has considered the Application and determined that approval is warranted.

NOW THEREFORE the Commission orders as follows:

- 1. The Adjusted LLH and HLH Baselines and Adjusted Reference Demands contained in Appendix D of the Application are approved effective May 1, 2016.
- 2. Appendices C and D of the Application will be held in confidence as they contain commercially sensitive information.

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

Filepath

**Rate Schedule 1892 -
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**BC Hydro Transmission Service Market
Reference-Priced Rates Application**

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix B

Rate Schedule 1892 – Transmission Service – Freshet Energy

Appendix B

BC Hydro

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SCHEDULE 1892 – TRANSMISSION SERVICE – FRESHET ENERGY

Availability: For Customers supplied with Electricity under Rate Schedule 1823 that increase their Electricity usage during the Freshet Period, subject to the Special Conditions below.

Applicable in: Rate Zone I excluding the Districts of Kingsgate-Yahk and Lardeau-Shutty Bench.

Termination Date: This Rate Schedule will terminate effective December 31, 2017.

Definitions: Terms used in this Rate Schedule have the meaning given to them in Tariff Supplement 5 or Rate Schedule 1823. In addition, the following terms have the following meanings:

“Freshet Period” means May 1 to July 31 inclusive;

“HLH” means the hours ending 0700 to 2200, Monday through Saturday excluding North American Electric Reliability Corp. holidays;

“HLH Baseline” means the Customer’s average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period;

“HLH Gross Freshet Energy” means the sum of energy taken by the Customer during each HLH of the current Freshet Period in excess of the HLH Baseline, excluding all hours where the energy taken is less than the HLH Baseline;

“HLH Net Freshet Energy” means the total energy taken by the Customer during all HLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all HLH of the 2015 Freshet Period;

“HLH Net-to-Gross Ratio” means the ratio obtained by dividing HLH Net Freshet Energy by HLH Gross Freshet Energy;

“LLH” means the hours ending 2300 to 0600, Monday through Saturday and all day Sunday and North American Electric Reliability Corp. holidays;

“LLH Baseline” means the Customer’s average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period;

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"LLH Gross Freshet Energy" means the sum of energy taken by the Customer during each LLH of the current Freshet Period in excess of the LLH Baseline, excluding all hours where the energy taken is less than the LLH Baseline;

"LLH Net Freshet Energy" means the total energy taken by the Customer during all LLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all LLH of the 2015 Freshet Period;

"LLH Net-to-Gross Ratio" means the ratio obtained by dividing LLH Net Freshet Energy by LLH Gross Freshet Energy; and

"Reference Demand" means the average of the highest kV.A Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.

Rate: Energy Charge:

The charge applied to energy supplied under this Rate Schedule 1892 during each HLH and LLH of the current Freshet Period is equal to:

1. the greater of
 - (a) the Intercontinental Exchange (ICE) Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price, as published by ICE in the ICE Day Ahead Power Price Report, applicable to the hour, and
 - (b) \$0/kW.h, plus
2. A \$3/MW.h wheeling rate.

Reference Demand for Rate Schedule 1823:

If the Customer is supplied with Electricity under this Rate Schedule 1892, for the purposes of determining Billing Demand under Rate Schedule 1823 for each of the Billing Periods during the current Freshet Period, the highest kV.A Demand during the High Load Hours in the Billing Period shall be equal to the lesser of:

1. the Reference Demand; and
2. the actual highest kV.A Demand during the High Load Hours in the Billing Period.

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Reference Energy for Rate Schedule 1823:

If the Customer is supplied with Electricity under this Rate Schedule 1892, the energy supplied to the customer under Rate Schedule 1823 shall be deemed to be the total energy supplied to the Customer less HLH and LLH Net Freshet Energy.

Until BC Hydro has determined HLH and LLH Net Freshet Energy after the current Freshet Period, on an interim basis BC Hydro will bill the Customer for energy consumption under Rate Schedule 1823 during each HLH and LLH of the current Freshet Period on the basis that energy consumption is equal to the HLH Baseline and LLH Baseline respectively.

When BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer, BC Hydro will make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.

Rate Schedule 1892 Energy Determination:

If HLH Net Freshet Energy is greater than zero, for each HLH hour of the current Freshet Period the energy taken by the Customer during the hour in excess of the HLH Baseline will be multiplied by the HLH Net-to-Gross Ratio, and the product will be the amount of energy supplied during that HLH hour under this Rate Schedule 1892.

If LLH Net Freshet Energy is greater than zero, for each LLH hour of the current Freshet Period, the energy taken by the Customer during the hour in excess of the LLH Baseline will be multiplied by the LLH Net-to-Gross Ratio, and the product will be the amount of energy supplied during that LLH hour under this Rate Schedule 1892.

All other energy supplied to the Customer during the current Freshet Period shall be deemed to have been supplied under Rate Schedule 1823.

Special Conditions:

1. Electricity is available under this Rate Schedule on a pilot program basis during the Freshet Periods of 2016 and 2017 only.

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2. BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro shall not be required to construct a System Reinforcement under Electric Tariff Supplement 6 to provide service under this Rate Schedule.
 3. By March 1 of each year in which the Customer wishes to take Electricity under this Rate Schedule, the Customer must notify BC Hydro that the Customer elects to take Electricity under this Rate Schedule during the upcoming Freshet Period and also provide to BC Hydro an estimate of the amount of energy (in MW.h) that the Customer expects to take under this Rate Schedule during each month of the Freshet Period and a description of the operational changes the Customer plans to make at its plant to take advantage of this freshet energy pilot program.
 4. If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer's expected RS 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.
 5. Electricity under this Schedule will not be available to a Customer if:
 - (a) the Customer has an electricity purchase agreement (EPA) with BC Hydro, and
 - (b) the Customer has, in accordance with the EPA, changed the Seasonal, Monthly or Hourly GBL (as applicable and as defined in the EPA) applicable during the Freshet Period of 2016 or 2017.
 6. (a) A Customer taking Electricity under this Rate Schedule may, by providing notice to BC Hydro at any time prior to July 31, cancel supply under this Rate Schedule for the current Freshet Period.
-

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- (b) If a Customer taking Electricity under this Rate Schedule advises BC Hydro that the Customer is or will be taking Electricity under Rate Schedule 1880 during the current Freshet Period, supply under this Rate Schedule will be automatically cancelled for the current Freshet Period.
- (c) If supply under this Rate Schedule is canceled under paragraph (a) or (b), all Electricity supplied to the Customer during the current Freshet Period shall be deemed to be supplied under Rate Schedule 1823 or Rate Schedule 1880, as applicable. Such Customer's energy and demand charges will be determined in accordance with Rate Schedule 1823 or Rate Schedule 1880, whichever is applicable, and BC Hydro will make any necessary retroactive billing adjustments.
7. Subject to any advance billing arrangement under Electric Tariff Supplement 5 or other special billing terms in effect for a particular Customer, BC Hydro will bill for Electricity supplied under this Rate Schedule 1892 after the Freshet Period has ended and BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer. BC Hydro will then make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.
8. All monetary amounts referred to in this Rate Schedule will be paid in Canadian currency. The ICE Day Ahead Power Price Report referenced in this Rate Schedule is published in US dollars, and the amounts in the report will be converted from US dollars to Canadian dollars at the Bank of Canada noon spot rate on the applicable day(s).

<u>Taxes:</u>	The rates contained herein are exclusive of the Goods and Services tax and the Social Services tax.
<u>Note:</u>	The terms and conditions under which transmission service is supplied are contained in Electric Tariff Supplements 5 and 6.
<u>Rate Rider:</u>	The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix C

Customer RS 1892 Baseline Information

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix C-1

Catalyst Crofton

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix C-2

Catalyst Port Alberni

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Appendix C-3

Catalyst Powell

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix C-4

Canfor Chetwynd

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Nanaimo Forest Products

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Skookumchuck Pulp Mill

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

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Tree Island Industries

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application

Appendix D

List of Freshet HLH and LLH Baselines and Reference Demands for Commission Approval

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APPENDIX
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**Fred James**

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

bchydroregulatorygroup@bchydro.com

April 26, 2017

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

Dear Mr. Wruck:

**RE: British Columbia Utilities Commission (BCUC or Commission)
 British Columbia Hydro and Power Authority (BC Hydro)
 Rate Schedule (RS) 1892 – Transmission Service Freshet Energy
 Baselines Application (2017) (the Application)**

BC Hydro writes to the Commission to apply for approval of High Load Hour (**HLH**) Baselines, Low Load Hour (**LLH**) Baselines and Reference Demands for specified customers served on the Rate Schedule (**RS**) 1823 – Transmission Service Stepped Rate and that have elected to participate in Year 2 of the RS 1892 – Transmission Service Freshet Energy (**Freshet Rate**) pilot program.

BC Hydro requests that the Commission grant approval by Friday, May 19, 2017 to provide the specified customers with certainty as to the HLH and LLH Baselines and Reference Demand that will be used to determine the proportions of electricity purchases billed under RS 1823 and RS 1892 during the 2017 Freshet Period beginning May 1, 2017, and to provide BC Hydro with the baselines required to bill these customers correctly and on a timely basis. BC Hydro has included comprehensive information with this Application to facilitate the Commission's review process and timely approval.

This Application includes the following appendices:

- **Appendix A** contains a draft of the Commission Order BC Hydro is requesting;
- **Appendix B** contains a copy of RS 1892;
- **Appendix C** contains the following information for each of the four customer sites for which BC Hydro is requesting approval of alternative HLH and LLH Baselines and Reference Demands:
 - ▶ A copy of BC Hydro's letter to consider the alternative RS 1892 Baselines and Reference Demand proposed for each customer; and



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 Commission Secretary and Manager
 Regulatory Support
 British Columbia Utilities Commission
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- ▶ A copy of the RS 1892 alternative Baselines statement for each customer site signed by the customer to confirm agreement.
- **Appendix D** contains a list of the specific alternative HLH Baselines, LLH Baselines and Reference Demands for which BC Hydro is requesting approval.

Appendices C and D contain confidential customer information and are filed on a confidential basis with the Commission only. A public version of the Application is filed under separate cover.

Application

In this Application, BC Hydro seeks Commission approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, of the HLH Baselines, LLH Baselines and Reference Demands contained in Appendix D.

The RS 1892 Freshet Rate requires that BC Hydro determine HLH and LLH Baselines and a Reference Demand, as these terms are defined in RS 1892, for each participating customer site. BC Hydro will use these Baselines and Reference Demand, in accordance with RS 1892, to determine the amounts of energy and demand to be charged to participating customers under the RS 1823 Transmission Service Stepped Rate and the RS 1892 Freshet Rate.

A complete copy of the RS 1892 Freshet Rate is provided in Appendix B. The RS 1892 provisions used in determining the baselines and Reference Demand are repeated below for convenience:

“HLH Baseline” means the Customer’s average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period;

“LLH Baseline” means the Customer’s average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period;

“Reference Demand” means the average of the highest kV.A Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.

Special condition 4 of RS 1892 provides as follows:

“If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer’s expected RS 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree



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to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.”

In addition, at the Commission’s Streamlined Review Process for the RS 1892 Freshet Rate held on January 25, 2016 BC Hydro confirmed that it would apply to the Commission for approval of any alternative HLH and LLH Baselines and Reference Demands.

A total of 46 unique RS 1823 customer sites notified BC Hydro by March 1, 2017 of their election to take electricity under the RS 1892 Freshet Rate during the 2017 Freshet Period. Two customer sites have since rescinded their election, leaving a current balance of 44 participant customer sites in Year 2 of the pilot. Of these, four customer sites have requested adjustments to their LLH and HLH Baselines and/or Reference Demand as described below.

Summary of Customer Adjustments

The following summarizes the nature and rationale of the adjustments proposed by the customer and agreed to by BC Hydro for each of the four customer sites. Specific details of the adjustments are filed on a confidential basis in Appendix C. The four customers have been informed that the agreed-to alternative HLH and LLH Baselines and Reference Demands remain subject to Commission approval.

Catalyst Paper Corp. – Crofton pulp mill

The Crofton site completed a customer-funded DSM project in 2016. The annual energy savings impact of this project has been verified by BC Hydro. Catalyst requested an adjustment (decrease) to remove the impact of this DSM project from its Year 2 RS 1892 HLH and LLH Baselines and Reference Demand. BC Hydro and Catalyst agree that the impact of this discrete energy conservation measure should be included in Crofton’s Year 2 RS 1892 Baselines so as to more closely reflect expected RS 1823 electricity purchases for the 2017 Freshet Period.

Catalyst Paper Corp. - Powell River pulp mill

The Powell River site completed a customer-funded DSM project in 2016. The annual energy savings impact of this project have been verified by BC Hydro. Catalyst requested an adjustment (decrease) to remove the impact of this DSM project from its



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RS 1892 HLH and LLH Baselines and Reference Demand. BC Hydro and Catalyst agree that the impact of this discrete energy conservation measure should be included in Powell River's Year 2 RS 1892 Baselines so as to more closely reflect expected RS 1823 electricity purchases for the 2017 Freshet Period.

Howe Sound Pulp and Paper Corp. – Port Mellon pulp mill

In 2015, Howe Sound Pulp and Paper notified BC Hydro of the indefinite shutdown of its thermo-mechanical pulping (TMP) and Paper Machine operations effective July 31, 2015. These operations reflect the majority of site load for grid-supplied electricity. Howe Sound did not participate in the 2016 Freshet Period but it has elected to participate in the 2017 Freshet Period. However, Howe Sound advised that the Freshet Period of May 1 to July 31, 2015 (where these components of the mill were operating) is not representative of current normal site operations (where these components of the mill are shutdown). Accordingly, BC Hydro and Howe Sound agree that the RS 1823 electricity purchases made during the Freshet Period of May 1 to July 31, 2016 should be used to determine Year 2 RS 1892 baselines as this period more closely reflects expected RS 1823 electricity purchases during the 2017 Freshet Period.

Tolko Industries Ltd. – Lavington mill

In 2015, Tolko informed BC Hydro that Pinnacle Renewable Energy was constructing a new pellet plant at its Lavington mill site which would be connected to Tolko's private electricity infrastructure "behind the meter" effective August 1, 2015. As a result, all new electrical load for the pellet plant will register as a load increase at the Tolko Lavington site. Tolko and BC Hydro agree that the 2015 Freshet Period of May 1 to July 31, 2015 is not representative of normal site operations because metered RS 1823 electricity does not include the additional pellet plant load. Accordingly, BC Hydro and Tolko agree that RS 1823 electricity purchases from the 2016 Freshet Period (May 1 to July 31, 2016) should be used to determine Year 2 RS 1892 baselines as this period more closely reflects expected RS1823 electricity purchases during the 2017 Freshet Period.

Request for Confidentiality of Customer Information

Appendix C of this Application provides the customer's alternative Freshet Baselines and confidential information about the customer's projects, operations and electricity consumption data that form the basis for adjustment. Appendix D provides the customer's expected normal electricity usage during the Freshet Period.



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Customers consider this information to be commercially sensitive and confidential because competitors could use it to estimate the customer's production levels, cost of production and efficiency. BC Hydro consistently treats this customer information as confidential. Accordingly, pursuant to section 18 of the Commission's Rules of Practice and Procedure (attached to Order No. G-1-16), BC Hydro requests that the Commission treat Appendices C and D as confidential.

The public version of this Application does not include redacted versions of Appendices C and D; instead, the section above provides non-confidential summaries of the confidential information.

Copies of the Application are being distributed to the customers for whom BC Hydro is applying for approval of adjusted baselines, but each customer will be provided with only the information in the appendix that relates to their account and not the information that relates to other customer accounts.

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Fred James
Chief Regulatory Officer

ac/rh

Enclosure

Copy to: BCUC Project No.3698781 (2015 Rate Design Application) Registered
Intervener Distribution List.



**BC Hydro Rate Schedule 1892 – Transmission
Service Freshet Energy Baselines Application (2017)**

Appendix A

Draft Order



Sixth floor, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
TEL: (604) 660-4700
BC Toll Free: 1-800-663-1385
FAX: (604) 660-1102

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)
Rate Schedule 1892 Transmission Service Freshet Baseline Application (2017)

BEFORE:

Commissioner
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. On September 24, 2015, British Columbia Hydro and Power Authority (BC Hydro) filed with the British Columbia Utilities Commission (Commission) the first module of a rate design application (2015 RDA);
- B. Among the various approvals sought in the 2015 RDA, BC Hydro sought approval for a new optional rate schedule (RS) 1892 Freshet Rate, which provides participating customers market pricing for incremental consumption during the May to July freshet period on a pilot basis ending December 31, 2017;
- C. The Commission held a Streamlined Review Process (SRP) on January 25, 2016 for the RS 1892 Freshet Rate;
- D. By Order No. G-17-16 dated February 9, 2016 the Commission approved the RS 1892 Freshet Rate effective the date of the Order;
- E. The RS 1892 Freshet Rate requires that BC Hydro determine a "HLH Baseline", "LLH Baseline" and "Reference Demand", as defined in RS 1892, for each participating customer. BC Hydro will use these baselines and Reference Demand, in accordance with RS 1892, to determine the amounts of energy and demand to be charged under the RS 1823 Transmission Service Stepped Rate and the RS 1892 Freshet Rate, respectively;
- F. Special condition 4 of the RS 1892 Freshet Rate provides as follows:

"If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer's expected RS 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand

.../2

**Rate Schedule 1892 -
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Reference-Priced Rates Application**

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with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.”

- G. At the SRP for the RS 1892 Freshet Rate BC Hydro confirmed that it would apply to the Commission for approval of any alternative LLH Baseline, HLH Baseline or Reference Demand;
- H. On April 29, 2016 BC Hydro filed with the Commission alternative LLH and HLH Baselines and Reference Demands for seven of the 45 customers that elected to participate in year one of the RS 1892 Freshet Rate. These alternative Baselines and Reference Demands were approved by Commission Order No. G-76-16.
- I. On April 26, 2017 BC Hydro filed with the Commission alternative LLH and HLH Baselines and Reference Demands for four of the 44 customers that have elected to participate in year two of the RS 1892 Freshet Rate, and requested the Commission approve the alternative baselines and Reference Demands (Application);
- J. The Application includes evidence explaining why the LLH and HLH Baselines and Reference Demand calculated in accordance with the provisions of RS 1892 are not representative of the Customers’ expected RS 1823 electricity usage during the freshet period of 2017, how the alternative baselines and Reference Demands were calculated, and that the four customers agreed to the alternative baselines and Reference Demands;
- K. BC Hydro filed a public and a confidential version of the Application. In accordance with the Commission’s Rules of Practice and Procedures, Part IV, section 18, BC Hydro is requesting that Appendices C and D of the Application be held in confidence as they contain information that is commercially sensitive to the four customers;
- L. BC Hydro requests the Commission grant approval by Friday, May 19, 2017 to provide the four customers with certainty as to the LLH and HLH Baselines and Reference Demand that will apply during the freshet period beginning May 1, 2017; and
- M. The Commission has considered the Application and determined that approval is warranted.

NOW THEREFORE the Commission orders as follows:

- 1. The Alternative LLH and HLH Baselines and Reference Demands contained in Appendix D of the Application are approved effective May 1, 2017.
- 2. Appendices C and D of the Application will be held in confidence as they contain commercially sensitive information.

Filepath

**Rate Schedule 1892 -
Transmission Service Freshet Energy Baselines Application (2017)**

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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

Filepath

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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application (2017)

Appendix B

Rate Schedule 1892 – Transmission Service – Freshet Energy

BC Hydro

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5. TRANSMISSION SERVICE

RATE SCHEDULE 1892 – TRANSMISSION SERVICE – FRESHET ENERGY

Availability	For Customers supplied with Electricity under Rate Schedule 1823 (Stepped Rate) that increase their Electricity usage during the Freshet Period, subject to the Special Conditions below.
Applicable in	Rate Zone I excluding the Districts of Kingsgate-Yahk and Lardeau-Shutty Bench.
Termination Date	This Rate Schedule will terminate effective December 31, 2017.
Rate	<p>Energy Charge:</p> <p>The charge applied to energy supplied under this Rate Schedule 1892 during each HLH and LLH of the current Freshet Period is equal to:</p> <ol style="list-style-type: none">The greater of<ol style="list-style-type: none">The Intercontinental Exchange (ICE) Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour, and\$0/kWh, plusA \$3/MWh wheeling rate.
Definitions	<p>Terms used in this Rate Schedule have the meanings given to them in Electric Tariff Supplement No. 5 or Rate Schedule 1823 (Stepped Rate). In addition, the following terms have the following meanings:</p> <ol style="list-style-type: none">Freshet Period May 1 to July 31 inclusive.

ACCEPTED: April 13, 2017

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Transmission Service Freshet Energy Baselines Application (2017)**

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2.	HLH The hours ending 0700 to 2200, Monday through Saturday excluding North American Electric Reliability Corporation holidays.
3.	HLH Baseline The Customer's average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period.
4.	HLH Gross Freshet Energy The sum of energy taken by the Customer during each HLH of the current Freshet Period in excess of the HLH Baseline, excluding all hours where the energy taken is less than the HLH Baseline.
5.	HLH Net Freshet Energy The total energy taken by the Customer during all HLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all HLH of the 2015 Freshet Period.
6.	HLH Net to Gross Ratio The ratio obtained by dividing HLH Net Freshet Energy by HLH Gross Freshet Energy.
7.	LLH The hours ending 2300 to 0600, Monday through Saturday and all day Sunday and North American Electric Reliability Corporation holidays.
8.	LLH Baseline The Customer's average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period.

ACCEPTED: April 13, 2017

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	<p>9. LLH Gross Freshet Energy</p> <p>The sum of energy taken by the Customer during each LLH of the current Freshet Period in excess of the LLH Baseline, excluding all hours where the energy taken is less than the LLH Baseline.</p> <p>10. LLH Net Freshet Energy</p> <p>The total energy taken by the Customer during all LLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all LLH of the 2015 Freshet Period.</p> <p>11. LLH Net to Gross Ratio</p> <p>The ratio obtained by dividing LLH Net Freshet Energy by LLH Gross Freshet Energy.</p> <p>12. Reference Demand</p> <p>The average of the highest kVA Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.</p>
Reference Demand for Rate Schedule 1823	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, for the purposes of determining Billing Demand under Rate Schedule 1823 for each of the Billing Periods during the current Freshet Period, the highest kVA Demand during the High Load Hours in the Billing Period will be equal to the lesser of:</p> <ol style="list-style-type: none">1. The Reference Demand; and2. The actual highest kVA Demand during the High Load Hours in the Billing Period.

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Reference Energy for Rate Schedule 1823	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, the energy supplied to the Customer under Rate Schedule 1823 will be deemed to be the total energy supplied to the Customer less HLH and LLH Net Freshet Energy.</p> <p>Until BC Hydro has determined HLH and LLH Net Freshet Energy after the current Freshet Period, on an interim basis BC Hydro will bill the Customer for energy consumption under Rate Schedule 1823 during each HLH and LLH of the current Freshet Period on the basis that energy consumption is equal to the HLH Baseline and LLH Baseline respectively.</p> <p>When BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer, BC Hydro will make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.</p>
Rate Schedule 1892 Energy Determination	<ol style="list-style-type: none">1. If HLH Net Freshet Energy is greater than zero, for each HLH hour of the current Freshet Period the energy taken by the Customer during the hour in excess of the HLH Baseline will be multiplied by the HLH Net to Gross Ratio, and the product will be the amount of energy supplied during that HLH hour under this Rate Schedule 1892.2. If LLH Net Freshet Energy is greater than zero, for each LLH hour of the current Freshet Period, the energy taken by the Customer during the hour in excess of the LLH Baseline will be multiplied by the LLH Net to Gross Ratio, and the product will be the amount of energy supplied during that LLH hour under this Rate Schedule 1892.3. All other energy supplied to the Customer during the current Freshet Period will be deemed to have been supplied under Rate Schedule 1823.
Special Conditions	<ol style="list-style-type: none">1. Electricity is available under this Rate Schedule on a pilot program basis during the Freshet Periods of 2016 and 2017 only.

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	<p>2. BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 to provide Service under this Rate Schedule.</p> <p>3. By March 1 of each year in which the Customer wishes to take Electricity under this Rate Schedule, the Customer must notify BC Hydro that the Customer elects to take Electricity under this Rate Schedule during the upcoming Freshet Period and also provide to BC Hydro an estimate of the amount of energy (in MWh) that the Customer expects to take under this Rate Schedule during each month of the Freshet Period and a description of the operational changes the Customer plans to make at its plant to take advantage of this freshet energy pilot program.</p> <p>4. If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer's expected Rate Schedule 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.</p>
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ACCEPTED: April 13, 2017

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Transmission Service Freshet Energy Baselines Application (2017)

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	<p>5. Electricity under this Rate Schedule will not be available to a Customer if:</p> <p>(a) The Customer has an electricity purchase agreement (EPA) with BC Hydro; and</p> <p>(b) The Customer has, in accordance with the EPA, changed the Seasonal, Monthly or Hourly GBL (as applicable and as defined in the EPA) applicable during the Freshet Period of 2016 or 2017.</p> <p>6. A Customer taking Electricity under this Rate Schedule may, by providing notice to BC Hydro at any time prior to July 31, cancel supply under this Rate Schedule for the current Freshet Period.</p> <p>7. If a Customer taking Electricity under this Rate Schedule advises BC Hydro that the Customer is or will be taking Electricity under Rate Schedule 1880 (Standby and Maintenance) during the current Freshet Period, supply under this Rate Schedule will be automatically cancelled for the current Freshet Period.</p> <p>8. If supply under this Rate Schedule is canceled under Special Condition No. 6 or 7, all Electricity supplied to the Customer during the current Freshet Period will be deemed to be supplied under Rate Schedule 1823 or Rate Schedule 1880, as applicable. Such Customer's Energy and Demand Charges will be determined in accordance with Rate Schedule 1823 or Rate Schedule 1880, whichever is applicable, and BC Hydro will make any necessary retroactive billing adjustments.</p> <p>9. Subject to any advance billing arrangement under Electric Tariff No. 5 or other special billing terms in effect for a particular Customer, BC Hydro will bill for Electricity supplied under this Rate Schedule 1892 after the Freshet Period has ended and BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer. BC Hydro will then make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.</p>
--	--

ACCEPTED: April 13, 2017

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	10. All monetary amounts referred to in this Rate Schedule will be paid in Canadian currency. The ICE Day Ahead Power Price Report referenced in this Rate Schedule is published in US dollars, and the amounts in the report will be converted from US dollars to Canadian dollars at the Bank of Canada daily exchange rate on the applicable day(s).
Taxes	The rates set out in this Rate Schedule are exclusive of goods and services and provincial sales taxes.
Note	The terms and conditions under which Transmission Service is supplied are contained in Electric Tariff Supplement Nos. 5 and 6.
Rate Rider	The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.

ACCEPTED: April 13, 2017

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Rate Schedule 1892 -
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BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application (2017)

Appendix C

Customer RS 1892 Baseline Information

PUBLIC



BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application (2017)

Appendix C-1

Catalyst Crofton and Catalyst Powell

PUBLIC

CONFIDENTIAL APPENDIX

FILED WITH BCUC ONLY



BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application (2017)

Appendix C-2

Howe Sound Port Mellon

PUBLIC

**CONFIDENTIAL
APPENDIX
FILED WITH BCUC
ONLY**



BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application (2017)

Appendix C-3

Tolko Lavington

PUBLIC

**CONFIDENTIAL
APPENDIX
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ONLY**



BC Hydro Rate Schedule 1892 – Transmission Service Freshet Energy Baselines Application (2017)

Appendix D

List of Alternative Freshet HLH and LLH Baselines and Reference Demands for Commission Approval

PUBLIC

**CONFIDENTIAL
APPENDIX
FILED WITH BCUC
ONLY**

**Fred James**

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

bchydroregulatorygroup@bchydro.com

April 19, 2018

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: British Columbia Utilities Commission (BCUC or Commission)
 British Columbia Hydro and Power Authority (BC Hydro)
 Rate Schedule (RS) 1892 – Transmission Service Freshet Energy
 Baselines Application (2018) (the Application)**

BC Hydro writes to the Commission to apply for approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, of High Load Hour (HLH) Baselines, Low Load Hour (LLH) Baselines and Reference Demands for specified customers who are served on Rate Schedule (RS) 1823 – Transmission Service Stepped Rate and have elected to participate in Year 3 of the RS 1892 – Transmission Service Freshet Energy (**Freshet Rate**) pilot program. By Order No. G-45-18 dated February 27, 2018, the Commission approved the extension of the Freshet Rate pilot program for a third year to December 31, 2018 and ordered that all other terms and conditions of RS 1892 will remain.

In accordance with Special Condition 3 of RS 1892, transmission service customers provided to BC Hydro written notice for a total 47 sites by March 1, 2018 of their intent to participate in Year 3 of the Freshet Rate Pilot. In accordance with Special Condition 4 of RS 1892, five of these customers requested alternative HLH and LLH Baselines and Reference Demands which have been agreed-to by BC Hydro, but remain subject to Commission review and approval.

BC Hydro requests that the Commission grant approval of the attached alternative HHLH and LLH Baselines and Reference Demands by Friday, May 18, 2018. Commission approval will provide the specified customers with certainty as to the HLH and LLH Baselines and Reference Demands that will be used to determine the proportions of their electricity purchases that will be billed under RS 1823 and RS 1892 during the 2018 Freshet Period. The 2018 Freshet Period begins May 1, 2018. We request that the Commission approval of the alternative HLH and LLH Baselines and Reference Demands by May 18, 2018 in order for BC Hydro to bill these customers correctly and on a timely basis. BC Hydro will bill these specified customers on an



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interim basis until their HLH and LLH baselines and Reference Demands have been approved by the Commission.

With this application, BC Hydro also seeks to address an oversight in the RS 1892 Freshet Rate tariff sheets that were approved by Commission Order No. G-45-18. These tariff sheets were updated in BC Hydro's Application for Year 3 Extension of the Freshet Rate pilot program filed on December 8, 2017 to reflect that the pilot program would be available during the 2018 Freshet Period. However, due to an oversight, BC Hydro did not amend Special Condition 4 (page 5-29) of the RS 1892 Freshet Rate to allow for the alternative baseline determination in the extended year, 2018, as approved. Thus, to avoid any potential confusion, BC Hydro has made an update to Special Condition 4 as shown in the updated RS 1892 tariff sheets in Appendix B, which includes a black-lined and clean copy of the tariff sheets for stamping by the Commission and returning to BC Hydro. This update does not change anything approved by Commission Order No. G-45-18.

This Application includes the following appendices:

- **Appendix A** contains a draft of the Commission Order BC Hydro is requesting;
- **Appendix B** contains a clean and black-lined copy of RS 1892;
- **Appendix C** contains the following information for each of the customer sites for which BC Hydro is requesting approval of alternative HLH and LLH Baselines and Reference Demands:
 - ▶ A copy of BC Hydro's letter to consider the alternative RS 1892 Baselines and Reference Demand proposed for each customer site; and
 - ▶ A copy of the alternative RS 1892 Baselines statement for each customer site signed by the customer to confirm agreement.
- **Appendix D** contains a list of the specific alternative HLH Baselines, LLH Baselines and Reference Demands for which BC Hydro is requesting approval.

Appendices C and D contain confidential customer information and are filed on a confidential basis with the Commission only. A public version of the Application is filed under separate cover.

Application

In this application, BC Hydro seeks Commission approval of the alternative HLH Baselines, LLH Baselines and Reference Demands contained in Appendix D.

The RS 1892 Freshet Rate requires that BC Hydro determine HLH and LLH Baselines and a Reference Demand, as these terms are defined in RS 1892, for each participating customer site. BC Hydro will use these Baselines and Reference Demand, in accordance with RS 1892, to determine the amounts of energy and demand to be

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charged to each participating customer site under the RS 1823 Transmission Service Stepped Rate and the RS 1892 Freshet Rate.

A complete copy of the updated RS 1892 Freshet Rate is provided in Appendix B. The RS 1892 provisions used in determining the Baselines and Reference Demand are repeated below for convenience:

“HLH Baseline” means the Customer’s average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period;

“LLH Baseline” means the Customer’s average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period;

“Reference Demand” means the average of the highest kV.A Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.

Special Condition 4 of the updated RS 1892 provides as follows:

“If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer’s expected RS 1823 Electricity usage during the Freshet Period of 2016, 2017 or 2018, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.”

In addition, at the Commission’s Streamlined Review Process for the RS 1892 Freshet Rate held on January 25, 2016, BC Hydro confirmed that it would apply to the Commission for approval of any alternative HLH and LLH Baselines and Reference Demands.

A total of 47 unique RS 1823 customer sites notified BC Hydro by March 1, 2018 of their election to take electricity under the RS 1892 Freshet Rate during the 2018 Freshet Period. Of these, five customer sites have requested adjustments to their LLH and HLH Baselines and/or Reference Demand as described below. Four of the customer sites are new participants for Year 3 of the Freshet Rate pilot; one of the customer sites participated in both Year 1 and Year 2.

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 Commission Secretary and Manager
 Regulatory Support
 British Columbia Utilities Commission
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Summary of Customer Adjustments

The following summarizes the nature and rationale of the adjustments proposed by the customer and which have been reviewed and agreed-to by BC Hydro for each of the five customer sites. Specific details of the adjustments are filed on a confidential basis in Appendix C. The five customers sites have been advised in writing that the agreed-to alternative HLH and LLH Baselines and Reference Demands remain subject to Commission approval. Refer to the letters attached in Appendix C.

Armex Mining Corp. (Amex)

In 2017, Armex bought the former Bethlehem Resources mine site. During the 2015 Freshet Period, the site was operated by the prior owner - Bethlehem Resources. BC Hydro and Armex have agreed that this period is not appropriate to use for RS 1892 HLH and LLH Baseline determination and Reference Demand since it does not reflect how Armex has operated the site as the new owner and therefore does not reflect expected RS 1823 electricity usage during the 2018 Freshet Period. Armex and BC Hydro agreed that RS 1823 electricity purchases from the 2017 Freshet Period (May 1 to July 31, 2017) should be used to establish RS 1892 HLH and LLH Baselines and Reference Demand.

Chemtrade Pulp Chemicals LP (Chemtrade)

Chemtrade advised BC Hydro that RS 1823 electricity purchases for the 2015 Freshet Period are not representative of normal operations at their plant because they were only operating one of their two chlorate production lines. BC Hydro and Chemtrade have agreed that RS 1823 electricity purchases during the Freshet Period of May 1 to July 31, 2017 should be used to determine RS 1892 HLH and LLH Baselines and Reference Demand. Since both chlorate production lines were operating during this period, BC Hydro and Chemtrade have agreed that this period is representative of expected RS 1823 electricity usage during the 2018 Freshet Period.

Mount Polley Mining Corporation (Mount Polley)

In 2014, Mount Polley experienced a tailings dam breach causing water and tailings to be released. Mine operations were shutdown and the site was placed under care and maintenance. The mine has since resumed normal operations. BC Hydro reviewed Mount Polley's RS 1823 electricity purchase data from the 2016 and 2017 Freshet Periods. Data from the most recent 2017 Freshet Period was not considered representative of normal operations because the mine experienced a forced shutdown for a two week period in July 2017 due to the B.C. wildfires in the region. BC Hydro and

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 Regulatory Support
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Mount Polley have agreed that RS 1823 electricity purchases during the Freshet Period of May 1 to July 31, 2016 should be used to determine RS 1892 HLH and LLH Baselines and Reference Demand as this period more closely reflects expected RS 1823 electricity usage during the 2018 Freshet Period.

Red Chris Development Co Ltd. (Red Chris)

The Red Chris Mine was commissioned in late 2014 and mill operations commenced in 2015. Red Chris and BC Hydro agree that the 2015 Freshet Period of May 1 to July 31, 2015 is not representative of normal site operations because the new mine was still subject to commissioning and ramp-up activities. BC Hydro reviewed RS 1823 electricity purchase data from the 2016 and 2017 Freshet Periods. Data from the 2017 Freshet Period was not considered representative because of non-normal operating conditions experienced at the mine in June and July. BC Hydro and Red Chris agree that RS 1823 electricity purchases from the 2016 Freshet Period (May 1 to July 31, 2016) is more representative of the customer's expected RS 1823 electricity usage during the 2018 Freshet Period.

Skookumchuk Pulp Inc. (Skookumchuk)

Skookumchuk completed two customer-funded Demand-side Management (DSM) projects in 2014 and 2016. The annual energy savings impact of these two DSM projects has now been verified by BC Hydro. Skookumchuk requested an adjustment (decrease) to remove the impact of the DSM projects from its existing RS 1892 HLH and LLH Baselines. BC Hydro and Skookumchuk agree that the impact of these verified energy conservation measures should be included as an adjustment to Skookumchuk's Year 3 RS 1892 HLH and LLH Baselines so as to more closely reflect expected RS 1823 electricity usage for the 2018 Freshet Period net of DSM. No change to Reference Demand for the 2018 Freshet Period was requested or required.

Request for Confidentiality of Customer Information

Appendix C of this application provides specific customers' alternative Freshet Baselines and confidential information about their projects, operations and electricity consumption data that form the basis for adjustment. Appendix D provides the certain customers' expected normal electricity usage during the 2018 Freshet Period.

Customers consider this information to be commercially sensitive and confidential because competitors could use it to estimate their production levels, cost of production and efficiency. BC Hydro has consistently treated this type of customer information as confidential. Accordingly, pursuant to section 18 of the Commission's Rules of Practice and Procedure (attached to Order No. G-1-16), BC Hydro requests that the Commission treat Appendices C and D as confidential.

April 19, 2018
Mr. Patrick Wruck
Commission Secretary and Manager
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The public version of this application does not include redacted versions of Appendices C and D; instead, the section above provides non-confidential summaries of the confidential information.

Copies of the Application are being distributed to the customers for whom BC Hydro is applying for approval of adjusted baselines, but each customer will be provided with only the information in the appendix that relates to their account and not the information that relates to other customer accounts.

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Fred James", written over a white background.

Fred James
Chief Regulatory Officer

ac/ma

Enclosure



BC Hydro RS 1892 – Transmission Service Freshet Energy Baselines Application

Appendix A

Draft Order



British Columbia
Utilities Commission

Appendix A

Sixth floor, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
TEL: (604) 660-4700
BC Toll Free: 1-800-663-1385
FAX: (604) 660-1102

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)
Rate Schedule 1892 Transmission Service Freshet Energy Baseline Application (2018)

BEFORE:

Commissioner
Commissioner
Commissioner

on Date

ORDER**WHEREAS:**

- A. On September 24, 2015, British Columbia Hydro and Power Authority (BC Hydro) filed with the British Columbia Utilities Commission (Commission) the 2015 Rate Design Application (2015 RDA);
- B. Among the various approvals sought in the 2015 RDA, BC Hydro sought approval for a new optional rate schedule (RS) 1892 Freshet Rate, which provides participating customers market pricing for incremental consumption during the May to July freshet period on a pilot basis ending December 31, 2017;
- C. The Commission held a Streamlined Review Process (SRP) on January 25, 2016 for the RS 1892 Freshet Rate;
- D. By Order No. G-17-16 dated February 9, 2016 the Commission approved the RS 1892 Freshet Rate effective the date of the Order;
- E. The RS 1892 Freshet Rate requires that BC Hydro determine a "HLH Baseline", "LLH Baseline" and "Reference Demand", as defined in RS 1892, for each participating customer. BC Hydro will use these baselines and Reference Demand, in accordance with RS 1892, to determine the amounts of energy and demand to be charged under the RS 1823 Transmission Service Stepped Rate and the RS 1892 Freshet Rate, respectively;
- F. Special condition 4 of the RS 1892 Freshet Rate provides as follows:

"If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer's expected RS 1823 Electricity usage during the Freshet Period of 2016 or 2017, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand

.../2

with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.”

- G. At the SRP for the RS 1892 Freshet Rate BC Hydro confirmed that it would apply to the Commission for approval of any alternative LLH Baseline, HLH Baseline or Reference Demand;
- H. On April 29, 2016 BC Hydro filed with the Commission alternative LLH and HLH Baselines and Reference Demands for seven of the 45 customers that elected to participate in year one of the RS 1892 Freshet Rate. These alternative Baselines and Reference Demands were approved by Commission Order No. G-76-16.
- I. On April 26, 2017 BC Hydro filed with the Commission alternative LLH and HLH Baselines and Reference Demands for four of the 44 customers that have elected to participate in year two of the RS 1892 Freshet Rate. These alternative Baselines and Reference Demands were approved by Commission Order No. G-77-17;
- J. On December 8, 2017, BC Hydro filed a Transmission Service Freshet Rate Preliminary Evaluation Report for Year 2 and Application for Year 3 Extension which sought approval for a one year extension of the freshet rate pilot program. This extension was approved by Commission Order No. G-45-18 dated February 27, 2018.
- K. On April 19, 2018 BC Hydro filed with the Commission alternative LLH and HLH Baselines and Reference Demands for five of the 47 customers that have elected to participate in year three of the RS 1892 Freshet Rate, and requested the Commission approve the alternative Baselines and Reference Demands (Application);
- L. The Application includes evidence explaining why the LLH and HLH Baselines and Reference Demand calculated in accordance with the provisions of RS 1892 are not representative of the customers’ expected RS 1823 electricity usage during the Freshet Period of 2018, how the alternative Baselines and Reference Demands were calculated, and that the five customers agreed to the alternative Baselines and Reference Demands;
- M. BC Hydro filed a public and a confidential version of the Application. In accordance with the Commission’s Rules of Practice and Procedures, Part IV, section 18, BC Hydro is requesting that Appendices C and D of the Application be held in confidence as they contain information that is commercially sensitive to the four customers;
- N. BC Hydro requests the Commission grant approval by Friday, May 18, 2018 to provide the five customers with certainty as to the LLH and HLH Baselines and Reference Demand that will apply during the freshet period beginning May 1, 2018; and
- O. The Commission has considered the Application and determined that approval is warranted.

NOW THEREFORE the Commission orders as follows:

1. The Alternative LLH and HLH Baselines and Reference Demands contained in Appendix D of the Application are approved effective May 1, 2018.
2. Appendices C and D of the Application will be held in confidence as they contain commercially sensitive information.

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



BC Hydro RS 1892 – Transmission Service Freshet Energy Baselines Application

Appendix B

Updated RS 1892 Black-lined and Clean

BC Hydro

Rate Schedule 1892 – Revision 23

Effective: May 1, 2018

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5. TRANSMISSION SERVICE**RATE SCHEDULE 1892 – TRANSMISSION SERVICE – FRESHET ENERGY**

Availability	For Customers supplied with Electricity under Rate Schedule 1823 (Stepped Rate) that increase their Electricity usage during the Freshet Period, subject to the Special Conditions below.
Applicable in	Rate Zone I excluding the Districts of Kingsgate-Yahk and Lardeau-Shutty Bench.
Termination Date	This Rate Schedule will terminate effective December 31, 2018.
Rate	<p>Energy Charge:</p> <p>The charge applied to energy supplied under this Rate Schedule 1892 during each HLH and LLH of the current Freshet Period is equal to:</p> <ol style="list-style-type: none"> The greater of <ol style="list-style-type: none"> The Intercontinental Exchange (ICE) Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour, and \$0/kWh, plus A \$3/MWh wheeling rate.
Definitions	<p>Terms used in this Rate Schedule have the meanings given to them in Electric Tariff Supplement No. 5 or Rate Schedule 1823 (Stepped Rate). In addition, the following terms have the following meanings:</p> <ol style="list-style-type: none"> Freshet Period <p>May 1 to July 31 inclusive.</p>

ACCEPTED: _____

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BC Hydro

Rate Schedule 1892 – Revision 23

Effective: May 1, 2018

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	<p>2. HLH</p> <p>The hours ending 0700 to 2200, Monday through Saturday excluding North American Electric Reliability Corporation holidays.</p> <p>3. HLH Baseline</p> <p>The Customer's average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period.</p> <p>4. HLH Gross Freshet Energy</p> <p>The sum of energy taken by the Customer during each HLH of the current Freshet Period in excess of the HLH Baseline, excluding all hours where the energy taken is less than the HLH Baseline.</p> <p>5. HLH Net Freshet Energy</p> <p>The total energy taken by the Customer during all HLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all HLH of the 2015 Freshet Period.</p> <p>6. HLH Net to Gross Ratio</p> <p>The ratio obtained by dividing HLH Net Freshet Energy by HLH Gross Freshet Energy.</p> <p>7. LLH</p> <p>The hours ending 2300 to 0600, Monday through Saturday and all day Sunday and North American Electric Reliability Corporation holidays.</p> <p>8. LLH Baseline</p> <p>The Customer's average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period.</p>
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ACCEPTED: _____

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COMMISSION SECRETARY

BC Hydro

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	<p>9. LLH Gross Freshet Energy</p> <p>The sum of energy taken by the Customer during each LLH of the current Freshet Period in excess of the LLH Baseline, excluding all hours where the energy taken is less than the LLH Baseline.</p> <p>10. LLH Net Freshet Energy</p> <p>The total energy taken by the Customer during all LLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all LLH of the 2015 Freshet Period.</p> <p>11. LLH Net to Gross Ratio</p> <p>The ratio obtained by dividing LLH Net Freshet Energy by LLH Gross Freshet Energy.</p> <p>12. Reference Demand</p> <p>The average of the highest kVA Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.</p>
Reference Demand for Rate Schedule 1823	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, for the purposes of determining Billing Demand under Rate Schedule 1823 for each of the Billing Periods during the current Freshet Period, the highest kVA Demand during the High Load Hours in the Billing Period will be equal to the lesser of:</p> <ol style="list-style-type: none"> 1. The Reference Demand; and 2. The actual highest kVA Demand during the High Load Hours in the Billing Period.

ACCEPTED: _____

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BC Hydro

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Reference Energy for Rate Schedule 1823	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, the energy supplied to the Customer under Rate Schedule 1823 will be deemed to be the total energy supplied to the Customer less HLH and LLH Net Freshet Energy.</p> <p>Until BC Hydro has determined HLH and LLH Net Freshet Energy after the current Freshet Period, on an interim basis BC Hydro will bill the Customer for energy consumption under Rate Schedule 1823 during each HLH and LLH of the current Freshet Period on the basis that energy consumption is equal to the HLH Baseline and LLH Baseline respectively.</p> <p>When BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer, BC Hydro will make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.</p>
Rate Schedule 1892 Energy Determination	<ol style="list-style-type: none"> 1. If HLH Net Freshet Energy is greater than zero, for each HLH hour of the current Freshet Period the energy taken by the Customer during the hour in excess of the HLH Baseline will be multiplied by the HLH Net to Gross Ratio, and the product will be the amount of energy supplied during that HLH hour under this Rate Schedule 1892. 2. If LLH Net Freshet Energy is greater than zero, for each LLH hour of the current Freshet Period, the energy taken by the Customer during the hour in excess of the LLH Baseline will be multiplied by the LLH Net to Gross Ratio, and the product will be the amount of energy supplied during that LLH hour under this Rate Schedule 1892. 3. All other energy supplied to the Customer during the current Freshet Period will be deemed to have been supplied under Rate Schedule 1823.
Special Conditions	<ol style="list-style-type: none"> 1. Electricity is available under this Rate Schedule on a pilot program basis during the Freshet Periods of 2016, 2017 and 2018 only.

ACCEPTED: _____

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BC Hydro

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| | <p>2. BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 to provide Service under this Rate Schedule.</p> <p>3. By March 1 of each year in which the Customer wishes to take Electricity under this Rate Schedule, the Customer must notify BC Hydro that the Customer elects to take Electricity under this Rate Schedule during the upcoming Freshet Period and also provide to BC Hydro an estimate of the amount of energy (in MWh) that the Customer expects to take under this Rate Schedule during each month of the Freshet Period and a description of the operational changes the Customer plans to make at its plant to take advantage of this freshet energy pilot program.</p> <p>4. If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer's expected Rate Schedule 1823 Electricity usage during the Freshet Period of 2016, or 2017 or 2018, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.</p> |
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ACCEPTED: _____

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BC Hydro

Rate Schedule 1892 – Revision 23

Effective: May 1, 2018

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	<p>5. Electricity under this Rate Schedule will not be available to a Customer if:</p> <p>(a) The Customer has an electricity purchase agreement (EPA) with BC Hydro; and</p> <p>(b) The Customer has, in accordance with the EPA, changed the Seasonal, Monthly or Hourly GBL (as applicable and as defined in the EPA) applicable during the Freshet Period of 2016, 2017 or 2018.</p> <p>6. A Customer taking Electricity under this Rate Schedule may, by providing notice to BC Hydro at any time prior to July 31, cancel supply under this Rate Schedule for the current Freshet Period.</p> <p>7. If a Customer taking Electricity under this Rate Schedule advises BC Hydro that the Customer is or will be taking Electricity under Rate Schedule 1880 (Standby and Maintenance) during the current Freshet Period, supply under this Rate Schedule will be automatically cancelled for the current Freshet Period.</p> <p>8. If supply under this Rate Schedule is canceled under Special Condition No. 6 or 7, all Electricity supplied to the Customer during the current Freshet Period will be deemed to be supplied under Rate Schedule 1823 or Rate Schedule 1880, as applicable. Such Customer's Energy and Demand Charges will be determined in accordance with Rate Schedule 1823 or Rate Schedule 1880, whichever is applicable, and BC Hydro will make any necessary retroactive billing adjustments.</p> <p>9. Subject to any advance billing arrangement under Electric Tariff No. 5 or other special billing terms in effect for a particular Customer, BC Hydro will bill for Electricity supplied under this Rate Schedule 1892 after the Freshet Period has ended and BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer. BC Hydro will then make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.</p>
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ACCEPTED: _____

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BC Hydro

Rate Schedule 1892 – Revision 23

Effective: May 1, 2018

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	10. All monetary amounts referred to in this Rate Schedule will be paid in Canadian currency. The ICE Day Ahead Power Price Report referenced in this Rate Schedule is published in US dollars, and the amounts in the report will be converted from US dollars to Canadian dollars at the Bank of Canada daily exchange rate on the applicable day(s).
Taxes	The rates set out in this Rate Schedule are exclusive of goods and services and provincial sales taxes.
Note	The terms and conditions under which Transmission Service is supplied are contained in Electric Tariff Supplement Nos. 5 and 6.
Rate Rider	The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.

ACCEPTED: _____

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COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – Revision 3
Effective: May 1, 2018
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5. TRANSMISSION SERVICE**RATE SCHEDULE 1892 – TRANSMISSION SERVICE – FRESHET ENERGY**

Availability	For Customers supplied with Electricity under Rate Schedule 1823 (Stepped Rate) that increase their Electricity usage during the Freshet Period, subject to the Special Conditions below.
Applicable in	Rate Zone I excluding the Districts of Kingsgate-Yahk and Lardeau-Shutty Bench.
Termination Date	This Rate Schedule will terminate effective December 31, 2018.
Rate	<p>Energy Charge:</p> <p>The charge applied to energy supplied under this Rate Schedule 1892 during each HLH and LLH of the current Freshet Period is equal to:</p> <ol style="list-style-type: none"> The greater of <ol style="list-style-type: none"> The Intercontinental Exchange (ICE) Mid-Columbia (Mid-C) Peak or Mid-C Off-Peak weighted average index price, as published by the ICE in the ICE Day Ahead Power Price Report, applicable to the hour, and \$0/kWh, plus A \$3/MWh wheeling rate.
Definitions	<p>Terms used in this Rate Schedule have the meanings given to them in Electric Tariff Supplement No. 5 or Rate Schedule 1823 (Stepped Rate). In addition, the following terms have the following meanings:</p> <ol style="list-style-type: none"> Freshet Period May 1 to July 31 inclusive.

ACCEPTED: _____

ORDER NO. _____

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BC Hydro

Rate Schedule 1892 – Revision 3

Effective: May 1, 2018

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2.	HLH	The hours ending 0700 to 2200, Monday through Saturday excluding North American Electric Reliability Corporation holidays.
3.	HLH Baseline	The Customer's average hourly energy consumption under Rate Schedule 1823 during HLH of the 2015 Freshet Period.
4.	HLH Gross Freshet Energy	The sum of energy taken by the Customer during each HLH of the current Freshet Period in excess of the HLH Baseline, excluding all hours where the energy taken is less than the HLH Baseline.
5.	HLH Net Freshet Energy	The total energy taken by the Customer during all HLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all HLH of the 2015 Freshet Period.
6.	HLH Net to Gross Ratio	The ratio obtained by dividing HLH Net Freshet Energy by HLH Gross Freshet Energy.
7.	LLH	The hours ending 2300 to 0600, Monday through Saturday and all day Sunday and North American Electric Reliability Corporation holidays.
8.	LLH Baseline	The Customer's average hourly energy consumption under Rate Schedule 1823 during LLH of the 2015 Freshet Period.

ACCEPTED: _____

ORDER NO. _____

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BC Hydro

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	<p>9. LLH Gross Freshet Energy</p> <p>The sum of energy taken by the Customer during each LLH of the current Freshet Period in excess of the LLH Baseline, excluding all hours where the energy taken is less than the LLH Baseline.</p> <p>10. LLH Net Freshet Energy</p> <p>The total energy taken by the Customer during all LLH of the current Freshet Period in excess of the total energy taken by the Customer under Rate Schedule 1823 during all LLH of the 2015 Freshet Period.</p> <p>11. LLH Net to Gross Ratio</p> <p>The ratio obtained by dividing LLH Net Freshet Energy by LLH Gross Freshet Energy.</p> <p>12. Reference Demand</p> <p>The average of the highest kVA Demand during the High Load Hours in each of May, June and July 2015, where the High Load Hour period is as defined in Rate Schedule 1823.</p>
Reference Demand for Rate Schedule 1823	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, for the purposes of determining Billing Demand under Rate Schedule 1823 for each of the Billing Periods during the current Freshet Period, the highest kVA Demand during the High Load Hours in the Billing Period will be equal to the lesser of:</p> <ol style="list-style-type: none"> 1. The Reference Demand; and 2. The actual highest kVA Demand during the High Load Hours in the Billing Period.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – Revision 3

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Reference Energy for Rate Schedule 1823	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, the energy supplied to the Customer under Rate Schedule 1823 will be deemed to be the total energy supplied to the Customer less HLH and LLH Net Freshet Energy.</p> <p>Until BC Hydro has determined HLH and LLH Net Freshet Energy after the current Freshet Period, on an interim basis BC Hydro will bill the Customer for energy consumption under Rate Schedule 1823 during each HLH and LLH of the current Freshet Period on the basis that energy consumption is equal to the HLH Baseline and LLH Baseline respectively.</p> <p>When BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer, BC Hydro will make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.</p>
Rate Schedule 1892 Energy Determination	<ol style="list-style-type: none"> 1. If HLH Net Freshet Energy is greater than zero, for each HLH hour of the current Freshet Period the energy taken by the Customer during the hour in excess of the HLH Baseline will be multiplied by the HLH Net to Gross Ratio, and the product will be the amount of energy supplied during that HLH hour under this Rate Schedule 1892. 2. If LLH Net Freshet Energy is greater than zero, for each LLH hour of the current Freshet Period, the energy taken by the Customer during the hour in excess of the LLH Baseline will be multiplied by the LLH Net to Gross Ratio, and the product will be the amount of energy supplied during that LLH hour under this Rate Schedule 1892. 3. All other energy supplied to the Customer during the current Freshet Period will be deemed to have been supplied under Rate Schedule 1823.
Special Conditions	<ol style="list-style-type: none"> 1. Electricity is available under this Rate Schedule on a pilot program basis during the Freshet Periods of 2016, 2017 and 2018 only.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – Revision 3

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	<p>2. BC Hydro agrees to provide Electricity under this Rate Schedule to the extent that it has energy and capacity to do so. BC Hydro may refuse Service under this Rate Schedule in circumstances where BC Hydro does not have sufficient energy or capacity. For greater certainty, BC Hydro will not be required to construct a System Reinforcement under Electric Tariff Supplement No. 6 to provide Service under this Rate Schedule.</p> <p>3. By March 1 of each year in which the Customer wishes to take Electricity under this Rate Schedule, the Customer must notify BC Hydro that the Customer elects to take Electricity under this Rate Schedule during the upcoming Freshet Period and also provide to BC Hydro an estimate of the amount of energy (in MWh) that the Customer expects to take under this Rate Schedule during each month of the Freshet Period and a description of the operational changes the Customer plans to make at its plant to take advantage of this freshet energy pilot program.</p> <p>4. If BC Hydro and the Customer agree that the LLH and HLH Baselines or Reference Demand calculated in accordance with the provisions above are not representative of the Customer's expected Rate Schedule 1823 Electricity usage during the Freshet Period of 2016, 2017 or 2018, and the parties agree to alternative LLH and HLH Baselines or Reference Demand, BC Hydro will file the agreed-to baselines or Reference Demand with the British Columbia Utilities Commission (BCUC). Subject to direction from the BCUC, BC Hydro will use such filed baselines or Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823.</p>
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ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – Revision 3

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	<p>5. Electricity under this Rate Schedule will not be available to a Customer if:</p> <p>(a) The Customer has an electricity purchase agreement (EPA) with BC Hydro; and</p> <p>(b) The Customer has, in accordance with the EPA, changed the Seasonal, Monthly or Hourly GBL (as applicable and as defined in the EPA) applicable during the Freshet Period of 2016, 2017 or 2018.</p> <p>6. A Customer taking Electricity under this Rate Schedule may, by providing notice to BC Hydro at any time prior to July 31, cancel supply under this Rate Schedule for the current Freshet Period.</p> <p>7. If a Customer taking Electricity under this Rate Schedule advises BC Hydro that the Customer is or will be taking Electricity under Rate Schedule 1880 (Standby and Maintenance) during the current Freshet Period, supply under this Rate Schedule will be automatically cancelled for the current Freshet Period.</p> <p>8. If supply under this Rate Schedule is canceled under Special Condition No. 6 or 7, all Electricity supplied to the Customer during the current Freshet Period will be deemed to be supplied under Rate Schedule 1823 or Rate Schedule 1880, as applicable. Such Customer's Energy and Demand Charges will be determined in accordance with Rate Schedule 1823 or Rate Schedule 1880, whichever is applicable, and BC Hydro will make any necessary retroactive billing adjustments.</p> <p>9. Subject to any advance billing arrangement under Electric Tariff No. 5 or other special billing terms in effect for a particular Customer, BC Hydro will bill for Electricity supplied under this Rate Schedule 1892 after the Freshet Period has ended and BC Hydro has determined the HLH and LLH Net Freshet Energy for the Customer. BC Hydro will then make any necessary retroactive billing adjustments in relation to energy supplied under Rate Schedule 1823.</p>
--	--

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – Revision 3

Effective: May 1, 2018

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	10. All monetary amounts referred to in this Rate Schedule will be paid in Canadian currency. The ICE Day Ahead Power Price Report referenced in this Rate Schedule is published in US dollars, and the amounts in the report will be converted from US dollars to Canadian dollars at the Bank of Canada daily exchange rate on the applicable day(s).
Taxes	The rates set out in this Rate Schedule are exclusive of goods and services and provincial sales taxes.
Note	The terms and conditions under which Transmission Service is supplied are contained in Electric Tariff Supplement Nos. 5 and 6.
Rate Rider	The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY



RS 1892 – Transmission Service Freshet Energy Baselines Application

Appendix C

Information for Customer Sites

PUBLIC

**CONFIDENTIAL
ATTACHMENT

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ONLY**



**RS 1892 – Transmission Service Freshet Energy
Baselines Application**

Appendix D

**List of Alternative HLH, LLH Baselines and
Reference Demands for Approval**

PUBLIC

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ATTACHMENT

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BCOAPO et al. Information Request No. 2.45.2 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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**45.0 Reference: Exhibit B-5, BCOAPO 1.11.1 and 1.11.2
Exhibit B-5, BCOAPO 1.35.1**

2.45.2 The response to BCOAPO 1.35.1 states that “BC Hydro seeks to make clear that the established baselines are representative of the customer’s expected future electricity consumption under the applicable firm service rate (RS 1823 or RS 1828) during the forthcoming freshet period (for RS 1892)”. During the Freshet Pilot project were any adjustments made to the baselines determined using the 2015 freshet period to specifically reflect the expectation that future consumption would be higher during the forthcoming freshet period even in the absence of RS 1892?

RESPONSE:

Yes, a number of RS 1892 baselines were adjusted higher to reflect the expectation that forthcoming freshet period electricity purchases under the applicable firm service rate would be higher than historical freshet period electricity purchases, absent RS 1892. These alternate RS 1892 baselines were approved by the BCUC. Please refer to BC Hydro’s response to BCOAPO IR 2.45.1.

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**46.0 Reference: Exhibit B-4, BCUC 1.3.1
 Exhibit B-5, BCOAPO 1.12.1
 BC Hydro's F2020-F2021 RRA, pages 5-16 to 5-17**

The discussion in the current F2020-F2021 RRA of BC Hydro's Work Smart Program uses the concept of "capacity hours".

2.46.1 The response to BCOAPO 1.12.1 states that the "If the Freshet Rate is made permanent, BC Hydro expects that ongoing annual implementation costs for RS 1892 will be lower than the annual costs reported in Table 10 of Appendix D of the Application for the Freshet Rate Pilot." It is noted that the annual costs in Table 10 range from \$30,000 to \$115,000. Please provide a more accurate estimate of the annual ongoing implementation cost for RS 1892 if implemented on a permanent basis.

RESPONSE:

Please refer to the table below for an estimate of annual ongoing implementation costs for RS 1892. These costs assume no further regulatory costs, which could arise from future compliance filings or applications.

Estimated future RS 1892 Cost Description	
Rate design/ compliance/ regulatory proceedings	\$ -
Customer and stakeholder engagement	\$ 5,000
Billing	\$ 5,000
Total	\$ 10,000

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**46.0 Reference: Exhibit B-4, BCUC 1.3.1
Exhibit B-5, BCOAPO 1.12.1
BC Hydro's F2020-F2021 RRA, pages 5-16 to 5-17**

The discussion in the current F2020-F2021 RRA of BC Hydro's Work Smart Program uses the concept of "capacity hours".

2.46.2 It is noted that the Pilot implementation costs referenced in BCOAPO 1.12.1 (and BCUC 1.3.1) exclude other staff and administration costs which were funded under existing budgets. Do the responses to BCOAPO 1.12.1 and question 5.1 (above) also exclude any staff and administration costs that will be funded under currently forecasted budgets?

RESPONSE:

Yes. Staff and administration costs are excluded from BC Hydro's forecast of RS 1892 implementation costs as they will be funded under currently forecasted budgets. For greater certainty, there is not presently any additional staff and/or administration cost budgeted to offer RS 1892 on an ongoing basis. RS 1892 will be managed as part of BC Hydro's portfolio of transmission voltage service rates using existing staff.

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**46.0 Reference: Exhibit B-4, BCUC 1.3.1
Exhibit B-5, BCOAPO 1.12.1
BC Hydro's F2020-F2021 RRA, pages 5-16 to 5-17**

The discussion in the current F2020-F2021 RRA of BC Hydro's Work Smart Program uses the concept of "capacity hours".

2.46.2 It is noted that the Pilot implementation costs referenced in BCOAPO 1.12.1 (and BCUC 1.3.1) exclude other staff and administration costs which were funded under existing budgets. Do the responses to BCOAPO 1.12.1 and question 5.1 (above) also exclude any staff and administration costs that will be funded under currently forecasted budgets?

2.46.2.1 If yes, what are the annual "capacity requirements" associated with these "funded" activities and what is their estimated annual value?

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.46.2.

BC Hydro notes the use of "capacity requirements" in this question, as well as a reference to Work Smart and "capacity hours" in the preamble. Capacity hours gained is a concept specific to Work Smart. BC Hydro provided further information on capacity hours in its F20-F21 RRA response to BCUC IRs 1.38.1 Attachment 1, 1.38.9 and 1.39.3. As a Work Smart initiative has not been performed in this area, the concept of capacity hours gained is inapplicable.

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47.0 Reference: Exhibit B-4, BCUC 1.7.1

2.47.1 Please confirm that the net revenue values provided in the response are in thousands of dollars (i.e., the Expected Incremental Load Net Revenue is \$71,000 per annum) and that the values do not include any allowance for implementation costs or load shifting impacts.

RESPONSE:

Confirmed. The output of the modelled net revenue values in BC Hydro's response to BCUC IR 1.7.1 are in thousands of dollars. These values are not adjusted for any prospective implementation costs or load shifting impacts.

BC Hydro cautions that it would not be appropriate to combine the expected net revenue values from the model results with BC Hydro's estimate of future RS 1892 implementation or load shifting costs for the purpose of determining an adjusted ratepayer benefit.

As described in BC Hydro's response to BCUC pre-filed Question No. 7, input assumptions to the model differ from actual Pilot conditions and results. The model was intended to test the reasonableness of the energy charge adder under a range of conditions. It was not primarily intended to provide a forecast of future RS 1892 participation or revenues. As an example, the model assumed customer participation levels and incremental energy use to be approximately 50 per cent lower than was typically seen over the past four years.

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47.0 Reference: Exhibit B-4, BCUC 1.7.1

2.47.2 Using the same assumptions as in BCUC 1.7.1, what is the estimated electricity cost reduction for participating customers per year over the same three-year period?

RESPONSE:

BC Hydro interprets the question to refer to the prospective average electricity price difference between future RS 1892 electricity prices and future RS 1823 or RS 1828 electricity prices.

An estimate of electricity cost reduction would require a customer-specific assessment of daily incremental energy use and daily Mid-C market prices. This is not an output of the model.

For context, BC Hydro notes that RS 1892 customers have not always seen an electricity cost reduction for incremental RS 1892 energy. That is, the average RS 1892 energy price for the freshet period can be higher than the prevailing RS 1823 or RS 1828 energy price, depending on the product of the net daily RS 1892 energy volume and the prevailing daily Mid-C energy price.

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48.0 Reference: Exhibit B-4, BCUC 1.7.1 and 1.8.5.1 & 1.8.5.2

2.48.1 The response to BCUC 1.8.5.1 states “the proposed adder pricing has been chosen because BC Hydro believes it to be low enough to encourage additional load and high enough that other ratepayers are not negatively impacted in most of the scenarios analyzed.” With reference to the analysis undertaken for BCUC 1.7.1, at what “percentile” is the Expected Incremental Load Net Revenue equal to zero?

RESPONSE:

The incremental load net revenue is zero between the 35th and 40th percentiles.

For clarity, BC Hydro notes that the intent of the model, and assumptions therein, is not to prescribe a specific revenue impact value and should not be interpreted to do so.

The model analysis presented in BC Hydro’s response to BCUC IR 1.7.1 provides a directional view as to whether RS 1892 energy pricing, including the proposed energy charge adder of \$3/MWh and energy price floor of \$0/MWh, is sufficient to recover the expected cost of the marginal resource that the model assumes would supply the incremental volume of RS 1892 energy under a range of potential conditions.

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48.0 Reference: Exhibit B-4, BCUC 1.7.1 and 1.8.5.1 & 1.8.5.2

2.48.2 Using the same analysis as presented in BCUC 1.7.1 and assuming annual costs associated with the factors cited in BCUC 1.8.5.2 (i.e., implementation costs; customer reported load shifting; unexplained load variances; natural load growth; and RS 1880 replacement service) were \$200,000 what would the rate adder need to be in order that the Expect Incremental Load Net Revenue would be zero?

RESPONSE:

Using the referenced analysis and assumptions, a fixed energy charge adder of \$5.28/MWh in each of May, June and July would result in expected incremental load net revenue of \$200,000. Subtracting an estimate of \$200,000 for annual costs from this value would reduce the adjusted net revenue to zero.

The analysis above assumes that customer behaviour does not change as a result of the modelled change in the energy charge adder. BC Hydro views this outcome as being unlikely.

BCOAPO et al. Information Request No. 2.48.3 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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48.0 Reference: Exhibit B-4, BCUC 1.7.1 and 1.8.5.1 & 1.8.5.2

2.48.3 Using the same analysis as presented in BCUC 1.7.1 and assuming annual costs associated with the factors cited in BCUC 1.8.5.2 were \$200,000 what would the rate adder need to be in order that the Expect Incremental Load Net Revenue would be greater zero at least 75% of the time (i.e., Expected Incremental Load Net Revenue is zero at the 25th percentile)?

RESPONSE:

The adder needed to achieve a 25th percentile incremental load net revenue of \$200,000, before annual costs, is **\$8.95**, holding all other assumptions equal.

Please also refer to BC Hydro's responses to BCUC pre-filed Question No. 7 and BCOAPO IR 2.48.1.

BCOAPO et al. Information Request No. 2.48.4 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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48.0 Reference: Exhibit B-4, BCUC 1.7.1 and 1.8.5.1 & 1.8.5.2

2.48.4 Using the same analysis as presented in BCUC 1.7.1 and assuming annual costs associated with the factors cited in BCUC 1.8.5.2 (i.e., implementation costs; customer reported load shifting; unexplained load variances; natural load growth; and RS 1880 replacement service) were \$400,000 what would the rate adder need to be in order that the Expect Incremental Load Net Revenue would be zero?

RESPONSE:

Using the referenced analysis and assumptions, a fixed energy charge adder of \$9.05/MWh in each of May, June and July would result in expected incremental load net revenue of \$400,000. Subtracting an estimate of \$400,000 for annual costs from this value would reduce the adjusted net revenue to zero.

The analysis above assumes that customer behaviour does not change as a result of the modelled change in the energy charge adder. BC Hydro views this outcome as being unlikely.

BCOAPO et al. Information Request No. 2.48.5 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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48.0 Reference: Exhibit B-4, BCUC 1.7.1 and 1.8.5.1 & 1.8.5.2

2.48.5 Using the same analysis as presented in BCUC 1.7.1 and assuming annual costs associated with the factors cited in BCUC 1.8.5.2 were \$400,000 what would the rate adder need to be in order that the Expect Incremental Load Net Revenue would be greater zero at least 75% of the time (i.e., Expected Incremental Load Net Revenue is zero at the 25th percentile)?

RESPONSE:

The adder needed to achieve a 25th percentile incremental load net revenue of \$400,000, before annual costs, is \$12.70, holding all other assumptions equal.

Please also refer to BC Hydro's response to BCOAPO IRs 2.48.1 and 2.48.3.

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49.0 Reference: Exhibit B-5, BCOAPO 1.20.1

The response to BCOAPO 1.20.1 outlines various aspects of the RS 1892 Rate Design that serve to minimize load shifting. One of those cited is Special Condition #2 where the customer must provide an estimate to BC Hydro of the amount of incremental energy that it expects to take, together with a description of the operational and/or production changes that the customer plans to make at its plant to increase load."

2.49.1 Under the RS 1892 provisions, can BC Hydro decline to provide a customer with service if it is not satisfied that the description of the operational and/or production changes that the customer plans to make at its plant will increase annual load (as opposed to simply shifting load)?

RESPONSE:

If the customer is unable or unwilling to describe the operational and/or production changes that will result in incremental energy consumption in accordance with Special Condition 2 of RS 1892 then there may be a basis to decline service.

However, in the event that BC Hydro was dissatisfied with the information provided, BC Hydro would seek to obtain additional information from the customer.

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49.0 Reference: Exhibit B-5, BCOAPO 1.20.1

The response to BCOAPO 1.20.1 outlines various aspects of the RS 1892 Rate Design that serve to minimize load shifting. One of those cited is Special Condition #2 where the customer must provide an estimate to BC Hydro of the amount of incremental energy that it expects to take, together with a description of the operational and/or production changes that the customer plans to make at its plant to increase load."

2.49.2 If not, why would it not be appropriate to change the rate provisions so as to allow BC Hydro to do so?

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.49.1.

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49.0 Reference: Exhibit B-5, BCOAPO 1.20.1

The response to BCOAPO 1.20.1 outlines various aspects of the RS 1892 Rate Design that serve to minimize load shifting. One of those cited is Special Condition #2 where the customer must provide an estimate to BC Hydro of the amount of incremental energy that it expects to take, together with a description of the operational and/or production changes that the customer plans to make at its plant to increase load."

49.3 If yes, in each future year does BC Hydro plan on reviewing potential RS 1892 customers' March 1st applications from this perspective?

RESPONSE:

Confirmed.

BCOAPO et al. Information Request No. 2.50.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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50.0 Reference: Exhibit B-1, Appendix D, page 13 of 296

2.50.1 Please provide a version of Table 2 that also includes Year 4 of the Pilot.

RESPONSE:

Please refer to BC Hydro's response to BCUC pre-filed Question No. 6.

BC Sustainable Energy Association Information Request No. 2.13.1 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 1 of 1
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13.0 Topic: Topic: Policy context
Reference: Comprehensive Review of BC Hydro: Phase 2 Interim Report¹

The BC Government's Comprehensive Review of BC Hydro: Phase 2 Interim Report states:

"Most large industrial customers take service at the Transmission Service stepped rate. Eliminating the higher Tier 2 energy charge may increase the affordability of electricity and could be done by flattening the energy charge or increasing the demand charge. Industrial stakeholders have provided the feedback that the two-tier design successfully focused on long-term conservation and load reductions, but that many customers are now facing exposure to the second tier as recognition of their conservation investments reaches expiration. Flattening the two-tier industrial rate would also support CleanBC by making increased consumption of clean electricity more competitive, thereby removing a barrier for electrification."

- 2.13.1 Please comment on whether approval of the Freshet Rate and the Incremental Energy Rate Pilot would complicate potential changes to the existing Transmission Service Rate Schedule 1823.

RESPONSE:

No, BC Hydro does not consider that approval of the Freshet Energy Rate (RS 1892) and Incremental Energy Rate Pilot (RS 1893) would complicate potential future changes to the existing Transmission Service Rate Schedule 1823.

Currently, under RS 1823, the customer is served under the Stepped Rate provisions of RS 1823 Energy Charge B or the flat provisions of RS 1823 Energy Charge A for baseline load. The flat energy rate concept described in the preamble would result in service that would be similar to existing service under RS 1823 Energy Charge A and RS 1828, both of which are already flat energy rates.

To the extent that potential changes to the RS 1823 design and/or pricing might impact the customer's expected future electricity use, BC Hydro would apply the Special Conditions of RS 1892 and RS 1893 (as applicable) to ensure that the customer's electricity baselines are representative of expected electricity use, absent these rates. Any such alternative baselines so determined would be filed with the BCUC for approval.

¹ https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/electricity/bc-hydro-review/bc_hydro_cr_ph2_ir_mar06_2020_f.pdf

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 45	\$ (107)	\$ (275)	\$ (337)
June	\$ 65	\$ (91)	\$ (55)	\$ (81)
July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

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2.9.1 Please confirm that the energy sold under Condition 1 was approximately ■ GWh and under Condition 3 was approximately ■ GWh

RESPONSE:

BC Hydro declines to provide further breakdown of purchases and sales under different marginal resource conditions. This is competitively sensitive information and it could enable third-parties to model BC Hydro's system and its potential import and export requirements. This could, in turn, harm our customers. As such BC Hydro respectfully declines to provide an explanation.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
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	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
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July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

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2.9.2 Please confirm that energy sold under Condition 1 confers a profit to BC Hydro of approximately \$10/MWh, and that energy sold under Condition 2 results in a loss of approximately \$4/MWh.

RESPONSE:

Energy sold under Condition 1 results in a deemed benefit to ratepayers of approximately \$10/MWh. Energy sold under Condition 2 results in a deemed loss to ratepayers of approximately \$4/MWh, assuming market prices are not negative.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
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	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
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Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
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June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 45	\$ (107)	\$ (275)	\$ (337)
June	\$ 65	\$ (91)	\$ (55)	\$ (81)
July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

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2.9.3 Please confirm that energy sold under Condition 3 is supplied from BC Hydro's system storage, and the cost of it is deemed to be the System Marginal Value set by BC Hydro.

RESPONSE:

Energy sold under Condition 3 is deemed to have been supplied from BC Hydro's system storage and the cost of the energy sold is deemed to be the System Marginal Value.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
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	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

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2.9.4 Please confirm that the 2019 sales under Condition 3 were approximately [REDACTED] GWh, which resulted in a loss of \$361,000, which is approximately [REDACTED]/MWh.

RESPONSE:

Please refer to BC Hydro's response to CEABC IR 2.9.1.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

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Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for ■■■ of the time and ■■■ of the total 111 GWh (i.e. ■■■ GWh) was sold during Condition 2 periods. Condition 1 accounted for ■■■ of the time and approximately ■■■ GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for ■■■ of the time, and the remaining ■■■ GWh of energy.

2.9.5 It appears that in the first 3 years of the pilot RS 1892, it was profitable for BC Hydro to supply a large portion of the incremental

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RS 1892 load from its system storage, but in year 4, this resulted in a loss. Does this mean that in years 1 to 3, the System Marginal Value (SMV) was lower than the Mid-C price plus the \$3 adder, but in year 4 the SMV was higher than the Mid-C price plus the adder?

RESPONSE:

In years 1 to 3, the System Marginal Value was on average lower than the Mid-C price plus the \$3 adder, but in year 4 the System Marginal Value was on average higher than the Mid-C price plus the adder.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

2.9.6 Although the market prices in year 4 were higher than in previous years, it seems that the System Marginal Price, set by BC Hydro,

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was even higher. Why did BC Hydro set the SMV so high? And was that very high SMV justified by subsequent events?

RESPONSE:

As described in BC Hydro's Year 4 Evaluation Report, System Marginal Value was elevated compared to prior years due to low storage levels going into the freshet period, coupled with a forecast of low freshet inflows. The freshet inflows did turn out to be low, as forecast.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

2.9.7 If the SMV in year 4 was higher than the cost of importing (plus the \$3 adder), then wouldn't that normally mean that BC Hydro

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should import as much as possible? In that case, why did BC Hydro choose to supply any of the energy from system storage rather than by importing it? Wouldn't BC Hydro have lost only \$4/MWh if it supplied the energy from imports, rather than the [REDACTED]/MWh which it lost by supplying from system storage?

RESPONSE:

BC Hydro notes that the approximate \$4/MWh loss applies to Condition 2, Minimum Generation with Imports. Given that Minimum Generation is defined as being in the state of operating only on must-take energy, this is the only time that the approximate \$4/MWh loss applies.

Due to a variety of factors (e.g., market depth, intertie limits) BC Hydro does not always import such that the system is in Condition 2.

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In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

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Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

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2.9.8 Please provide a table similar to Table 5, but showing the GWh in each of the 3 conditions for each of the 3 months in each of the 4 years. Please include the working Excel spreadsheet.

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 1.9.5.

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2.9.9 In each of the months and years under Condition 1 in the table provided for IR 2.9.7, what proportion of the total exports that

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would otherwise have been designated as “forced” was sold to customers pursuant to RS 1892? I.e. what proportion of the otherwise forced exports was avoided in each case as a result of sales under RS 1892?

RESPONSE:

In the after-the-fact rate impact evaluation, 100 per cent of the incremental load due to RS 1892 which occurs under Condition 1 is deemed to have otherwise been a forced export.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

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In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

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2.9.10 If the proportions of avoided forced exports given in the response to IR 2.9.8 are less than 100%, what can be done to move these proportions closer to 100%?

RESPONSE:

Please refer to BC Hydro's response to CEABC IR 2.9.9.

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9.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.

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In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

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2.9.11 What problems does BC Hydro foresee if it were to offer a similar freshet rate to the Large General Service customers? Does BC Hydro have a plan to do this?

RESPONSE:

Please refer to BC Hydro's response to CEC IR 1.1.1.2.

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10.0 Reference: Exhibit B-4, BC Hydro response to BCUC IRs 1.10.1, and 1.10.3, concerning BC Hydro's Market Energy imports and exports,

In it response to BCUC IR 1.10.1, BC Hydro states that "F2020 total Market energy imports are not yet available but are forecast to be 5,488 GWh."

2.10.1 BC Hydro normally reports three types of market energy transactions: Market Electricity Purchases, Surplus Sales, and Net Purchases (Sales) from Powerex. Is the 5,488 GWh identified in the quoted response as "Market energy imports" the same as Market Electricity Purchases? If not, how is it different?

RESPONSE:

The forecast of total Market Energy imports for F2020, of 5,488 GWh, is the sum of Market Electricity Purchases, Surplus Sales and Net Purchases (Sales) from Powerex.

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In it response to BCUC IR 1.10.1, BC Hydro states that "F2020 total Market energy imports are not yet available but are forecast to be 5,488 GWh."

2.10.2 How much of the projected imports of 5,488 GWh was imported in each of the months April, May, June, and July of 2019? And how much were the Surplus Sales and the Net Purchases (Sales) from Powerex in those same months?

RESPONSE:

Approximately 41 per cent of the total Market Energy imports forecast for F2020, of 5,488 GWh, occurred in April, May, June and July.

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In it response to BCUC IR 1.10.1, BC Hydro states that "F2020 total Market energy imports are not yet available but are forecast to be 5,488 GWh."

2.10.3 Even though that 5,488 GWh is not generated in British Columbia, it is still "electricity in British Columbia" as referenced in the Clean Energy Act Section 2 (c). That Section requires that 93% of the electricity in British Columbia must be generated from clean or renewable resources. Since that 5,488 GWh is roughly 10% of the electricity in British Columbia, please describe how BC Hydro ensures that this additional imported electricity does not cause the electricity in British Columbia to fall below the threshold of 93% generated from clean or renewable resources.

RESPONSE:

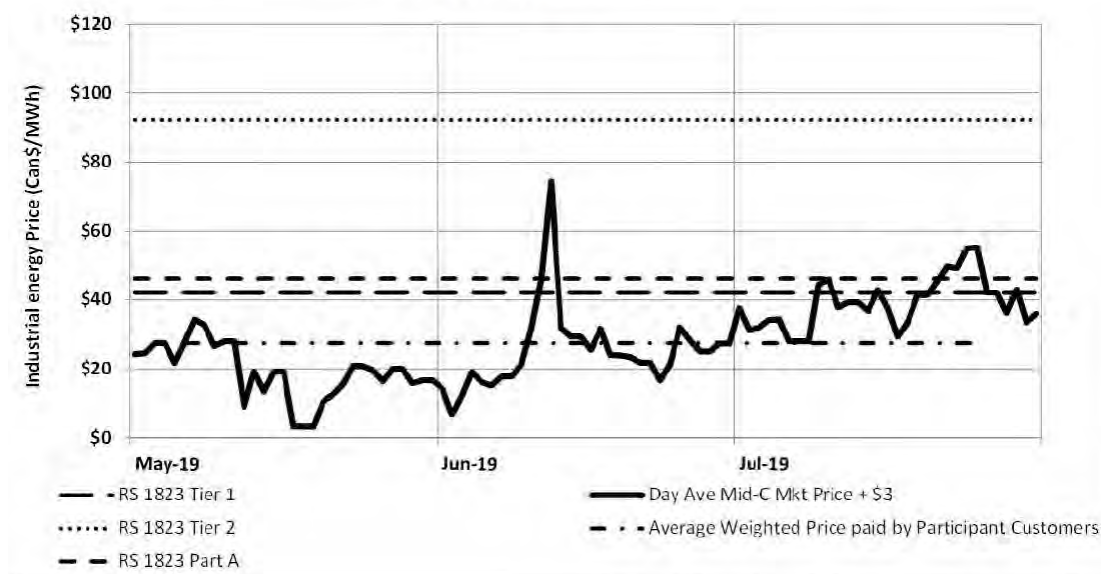
The *Clean Energy Act* energy objective is that at least 93 per cent of electricity generated in British Columbia is from clean or renewable resources. The 5,488 GWh forecast of total Market Energy imports is not generated in British Columbia and therefore does not apply to this objective.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

11.0 Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 8-9, RS 1892 Energy Pricing.

In its discussion of the energy pricing, BC Hydro provided the following Figure 3, comparing RS 1892 to RS 1823 prices.

Figure 3 RS 1823 and RS 1892 energy prices (May to July 2019)



In the description that followed, it identified the RS 1823 Tier 1 rate as \$45.35/MWh, the Tier 2 rate as \$101.60, and the Part A rate as \$50.98 (essentially the weighted average of Tier 1 and Tier 2 at the hypothetical ratio of 90% to 10%). Originally, the Tier 2 rate was intended to be a price signal based on the cost of new energy. However, BC Hydro has acknowledged that it is no longer an accurate price signal, but is only retained for consistency with the past.

2.11.1 When all of BC Hydro's current RS 1823 customers are considered, how much of their total load was billed at the Tier 1 rate, the Tier 2 rate, and the Part A rate, for each of the past 4 years (F2017 to F2020)?

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RESPONSE:

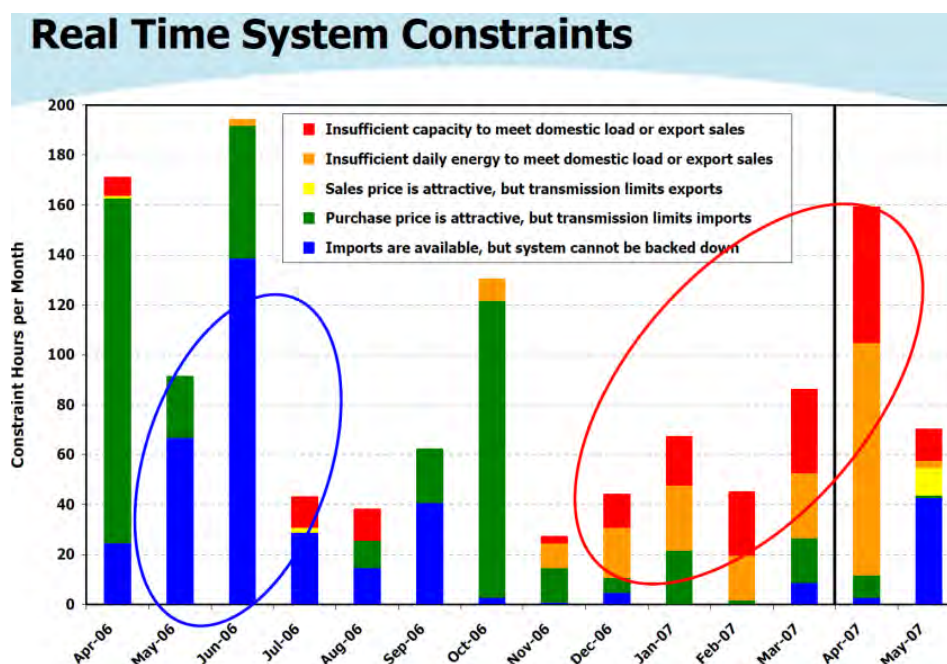
The table below provides the energy purchases for each of BC Hydro's F2017, F2018 and F2019. BC Hydro is unable to provide the breakdown for F2020 since the fiscal year and CBL annual review is not yet complete.

	F2017 (GWh)	F2018 (GWh)	F2019 (GWh)
RS 1823A	2,390	2,543	3,090
RS 1823 Tier 1	9,854	9,965	9,784
RS 1823 Tier 2	283	235	321

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12.0 Reference: Exhibit B-5, BC Hydro response to CEABC IR 1.7.1 – BC Hydro System Constraints.

In IR 1.7.1, CEABC asked BC Hydro to provide an updated time analysis of its operating system constraints, as depicted in the following chart, taken from a BC Hydro workshop:



Although this is apparently information BC Hydro does keep track of on an ongoing basis, it declined to provide it, on the grounds that this information would enable competitors to somehow forecast BC Hydro's potential import and export requirements.

2.12.1 CEABC hereby makes a similar request, but reduced to only the 4 months, April to July of each of the 4 years 2016 to 2019 (including the working Excel model containing the data).

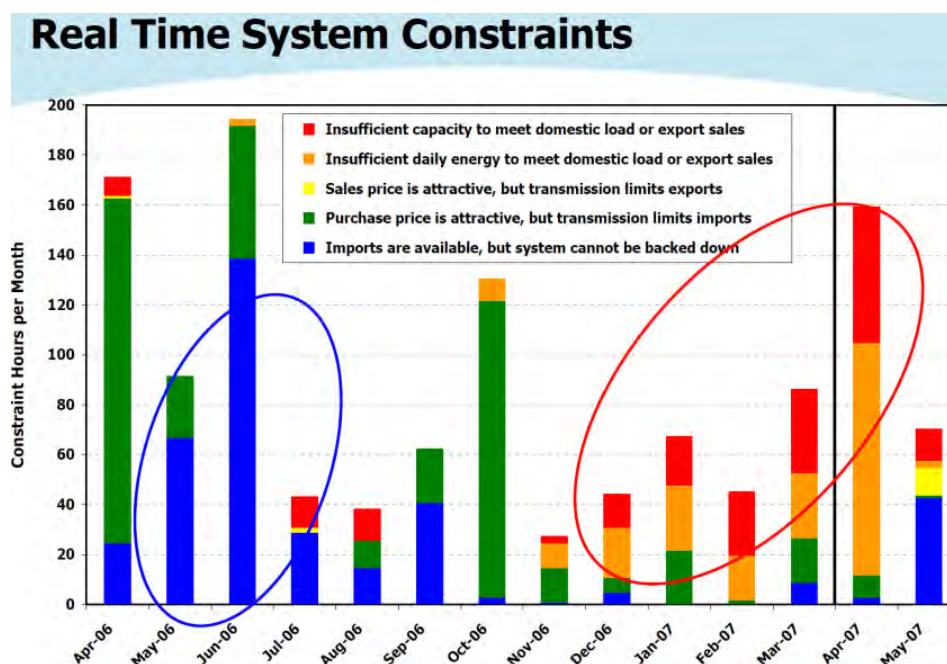
RESPONSE:

BC Hydro respectfully declines to provide the information, for the same reasons as noted in its response to CEABC IR 1.7.1.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

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2.12.2 Since the requested data is only for partial years and only for historic periods, a year or more in the past, and since weather and other operating conditions vary dramatically from one year to the next, CEABC is in need of some help to understand exactly how any such data could be usefully employed to predict BC Hydro's future import or export requirements. Therefore, if BC Hydro still declines to provide this data, then please provide a detailed step-by-step description of exactly how a 3rd party competitor could use this historical, partial year information to successfully predict BC Hydro's future import or export requirements.

Clean Energy Association of British Columbia Information Request No. 2.12.2 Dated: March 17, 2020 British Columbia Hydro & Power Authority Response issued March 25, 2020	Page 2 of 2
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RESPONSE:

This question is asking BC Hydro to publicly disclose a detailed road map for a way in which a third-party could use BC Hydro's data to the detriment of BC Hydro and its ratepayers. BC Hydro considers that disclosing such information is not in the public interest.

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British Columbia Hydro & Power Authority Transmission Service Market Reference-Priced Rates Application	Exhibit: B-8

13.0 Reference: Exhibit B-5, BC Hydro response to CEABC IR 1.4.2, and Exhibit B-1 from the 2019 Powerex Letter Agreement Application

In the 2019 Powerex Letter Application, BC Hydro described the liquidity of the Mid-C as declining over time, in the following way (on pages 5 and 6 of that Application, emphasis added):

“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...

...it is apparent that an alternative solution to the on-going operational supply issues **arising from the liquidity decline in day-ahead markets** would be a revised Transfer Pricing Agreement. BC Hydro and Powerex are considering updating the 2003 TPA, including considering how the 2003 TPA might usefully be revised to accommodate forward transactions.”

In IR 1.4.2, CEABC asked why, in the face of this declining liquidity of the Mid-C day-ahead trading volumes, BC Hydro continued to choose the Mid-C market price as its pricing point for this Freshet Rate. BC Hydro’s response denied that the Mid-C market was “illiquid”, only that there was a decline in liquidity over time (emphasis added):

“...BC Hydro specifically stated that there is an observed decline in the volume of wholesale electricity traded on a day-ahead basis in the Pacific Northwest. **While there is observed declining liquidity in the Mid-Columbia day-ahead market, Mid-C is still the most liquid market in the Pacific Northwest**, and there is a large amount of transmission capacity between B.C. and the Pacific Northwest.”

2.13.1 CEABC would like to know at what point in the decline of liquidity, a market would be judged to be too illiquid to provide a proper pricing benchmark? What are BC Hydro’s criteria for market liquidity? And what is the alternative pricing benchmark for the Freshet Pricing Rate (RS 1892), should the Mid-C market become, in BC Hydro’s assessment, too illiquid?

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RESPONSE:

BC Hydro's criteria for selecting a pricing benchmark are to select the most liquid market that is geographically close and accessible to B.C., hence its selection of Mid-C. For discussion of alternate pricing benchmarks, please refer to BC Hydro's response to BCUC IR 1.12.3.

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

INFORMATION REQUEST ROUND NO: #2

TO: BRITISH COLUMBIA HYDRO & POWER AUTHORITY

DATE: March 17, 2020

PROJECT NO: 1599053 Order G-327-19

APPLICATION NAME: Transmission Service Market Reference-Priced Rates Application (“Application”)

9.0 **Reference: Exhibit B-1, Application, Appendix E, Freshet Rate Pilot Final Evaluation Report for Year 4, 2019, pages 13 to 16, Discussion of Ratepayer Impact Analysis, and summary Table 5, and Exhibit B-4, response to BCUC IR 1.8.2.**

In Section 1.8.3, BC Hydro explained the differences between Conditions 1, 2, and 3, and in Table 5, BC Hydro presented the Monthly Ratepayer Benefit by System Condition, over the 4 years from 2016 to 2019:

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 61	\$ (6)	\$ 481	\$ 536
June	\$ -	\$ -	\$ 806	\$ 806
July	\$ -	\$ -	\$ 917	\$ 917
	\$ 61	\$ (6)	\$ 2,204	\$ 2,259
Year 2 (2017)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 56	\$ (93)	\$ 424	\$ 387
June	\$ 117	\$ (55)	\$ 402	\$ 464
July	\$ 38	\$ -	\$ 1,305	\$ 1,343
	\$ 211	\$ (148)	\$ 2,131	\$ 2,194
Year 3 (2018)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 205	\$ (78)	\$ -	\$ 127
June	\$ 170	\$ (77)	\$ 50	\$ 143
July	\$ 65	\$ (4)	\$ 1,541	\$ 1,602
	\$ 440	\$ (159)	\$ 1,591	\$ 1,872
Year 4 (2019)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	\$ 45	\$ (107)	\$ (275)	\$ (337)
June	\$ 65	\$ (91)	\$ (55)	\$ (81)
July	\$ -	\$ (94)	\$ (31)	\$ (125)
	\$ 110	\$ (292)	\$ (361)	\$ (543)
Totals	\$ 822	\$ (605)	\$ 5,565	\$ 5,782

In its response to BCUC IR 1.8.2, BC Hydro explains that, in Year 4 (2019), the system was under Condition 2 (Minimum generation with economic import) for [REDACTED] of the time and [REDACTED] of the total 111 GWh (i.e. [REDACTED] GWh) was sold during Condition 2 periods. Condition 1 accounted for [REDACTED] of the time and approximately [REDACTED] GWh of the total energy sold under RS 1892 (assuming a margin of \$10/MWh was achieved). Condition 3 accounted for [REDACTED] of the time, and the remaining [REDACTED] GWh of energy.

- 9.1 Please confirm that the energy sold under Condition 1 was approximately [REDACTED] GWh and under Condition 3 was approximately [REDACTED] GWh
- 9.2 Please confirm that energy sold under Condition 1 confers a profit to BC Hydro of approximately \$10/MWh, and that energy sold under Condition 2 results in a loss of approximately \$4/MWh.
- 9.3 Please confirm that energy sold under Condition 3 is supplied from BC Hydro's system storage, and the cost of it is deemed to be the System Marginal Value set by BC Hydro.
- 9.4 Please confirm that the 2019 sales under Condition 3 were approximately [REDACTED] GWh, which resulted in a loss of \$361,000, which is approximately [REDACTED]/MWh.
- 9.5 It appears that in the first 3 years of the pilot RS 1892, it was profitable for BC Hydro to supply a large portion of the incremental RS 1892 load from its system storage, but in year 4, this resulted in a loss. Does this mean that in years 1 to 3, the System Marginal Value (SMV) was lower than the Mid-C price plus the \$3 adder, but in year 4 the SMV was higher than the Mid-C price plus the adder?
- 9.6 Although the market prices in year 4 were higher than in previous years, it seems that the System Marginal Price, set by BC Hydro, was even higher. Why did BC Hydro set the SMV so high? And was that very high SMV justified by subsequent events?
- 9.7 If the SMV in year 4 was higher than the cost of importing (plus the \$3 adder), then wouldn't that normally mean that BC Hydro should import as much as possible? In that case, why did BC Hydro choose to supply any of the energy from system storage rather than by importing it? Wouldn't BC Hydro have lost only \$4/MWh if it supplied the energy from imports, rather than the [REDACTED]/MWh which it lost by supplying from system storage?
- 9.8 Please provide a table similar to Table 5, but showing the GWh in each of the 3 conditions for each of the 3 months in each of the 4 years. Please include the working Excel spreadsheet.
- 9.9 In each of the months and years under Condition 1 in the table provided for IR 2.9.7, what proportion of the total exports that would otherwise have been designated as "forced" was sold to customers pursuant to RS 1892? I.e. what proportion of the otherwise forced exports was avoided in each case as a result of sales under RS 1892?
- 9.10 If the proportions of avoided forced exports given in the response to IR 2.9.8 are less than 100%, what can be done to move these proportions closer to 100%?
- 9.11 What problems does BC Hydro foresee if it were to offer a similar freshet rate to the Large General Service customers? Does BC Hydro have a plan to do this?

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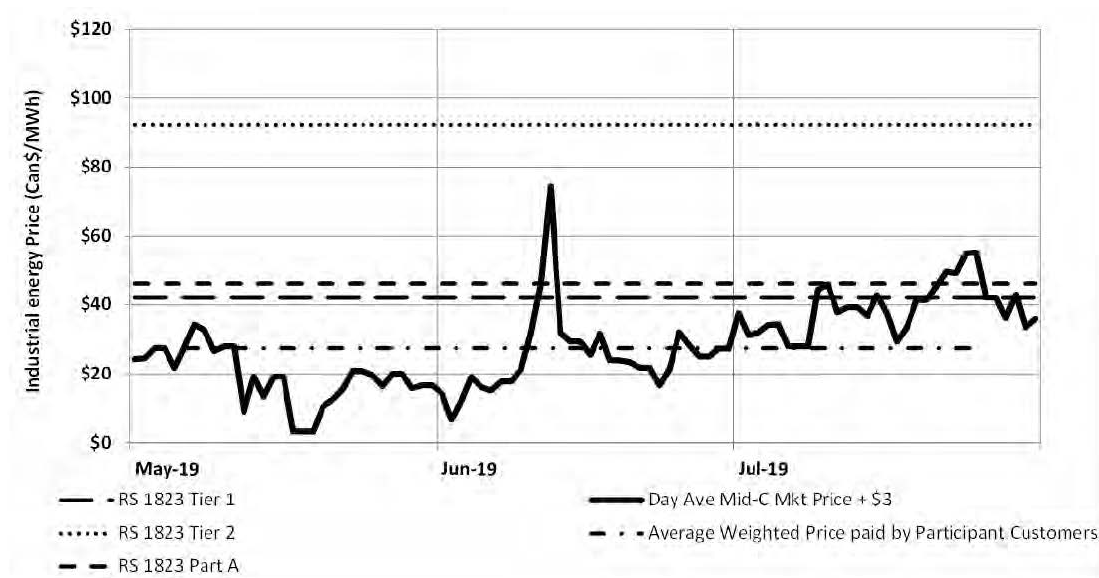
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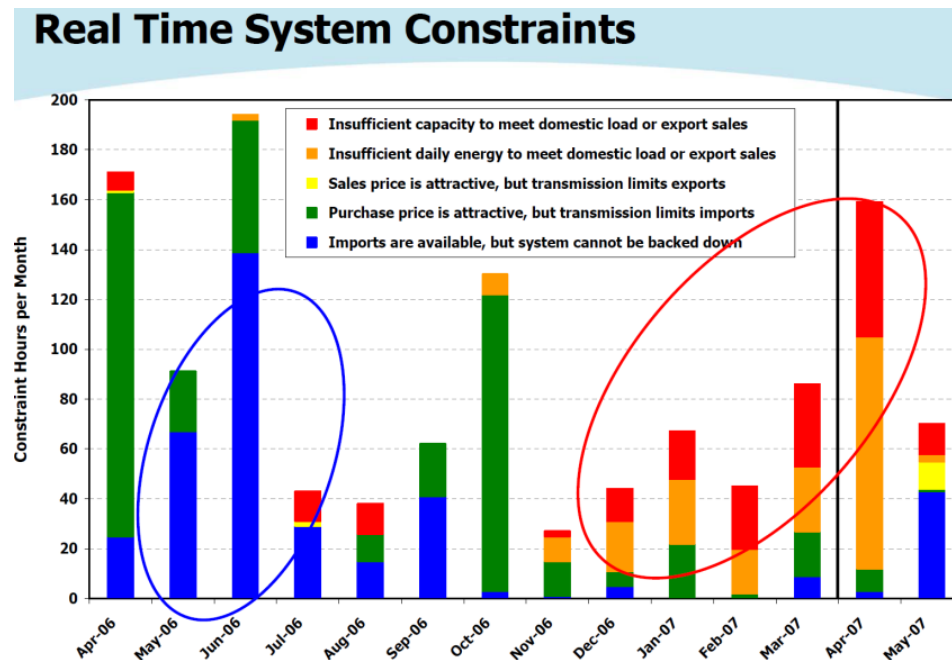


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supply issue BC Hydro faced in winter of 2018/2019, rather than attempting to rely on day-ahead purchases...

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