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October 31, 2019

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

Dear Mr. Wruck:

**RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application**

BC Hydro is submitting the Transmission Service Market Reference-Priced Rates Application (**the Application**).

BC Hydro is seeking approval of the Freshet Rate (Rate Schedule 1892) and Incremental Energy Rate Pilot (Rate Schedule 1893) pursuant to sections 58 to 60 of the *Utilities Commission Act*. BC Hydro is submitting its application for approval of the Freshet Rate in compliance with BCUC Order No. G-106-19, as revised by BCUC Order No. G-224-19.

The Freshet Rate was offered on an optional basis to transmission service Rate Schedule 1823 customers as a three year pilot and extended for an additional year during the months of May through July for calendar 2016, 2017, 2018 and 2019. BC Hydro filed the Freshet Rate Pilot Final Evaluation Report on December 17, 2018 in compliance with BCUC Order Nos. G-17-16 and G-45-18. BC Hydro is submitting the Freshet Rate 2019 Evaluation Report in Appendix E of this Application in compliance with BCUC Order No. G-106-19, as revised by BCUC Order No. G-224-19.

The Incremental Energy Rate Pilot is a proposed new optional rate for transmission service Rate Schedule 1823 customers that would be offered for incremental energy consumed above a baseline taken at any time during the year. Subscribers to this new rate would have access to market reference-priced energy for incremental electricity supplied on a non-firm, interruptible basis. BC Hydro is applying for the Incremental Energy Rate Pilot to be offered for a 51 month period.

BC Hydro has consulted extensively with both existing and prospective new Transmission Service customers, the Association of Major Power Customers of B.C. and other stakeholders. There is strong support for these proposed rates.

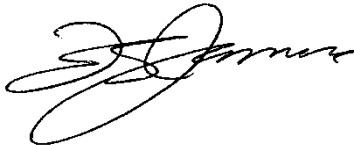
October 31, 2019
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British Columbia Utilities Commission
Transmission Service Market Reference-Priced Rates Application

The Application provides further detail on the orders sought by BC Hydro regarding these proposed rates.

A clean and black-lined copy of the Freshet Rate tariff sheets is included as Appendix B (Amended Freshet Rate RS 1892 (On-going)). A clean copy of the Incremental Energy Rate Pilot tariff sheets (RS 1893) is included as Appendix C.

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

ac/ma

Enclosure

Copy to: Interveners that attended the October and November 2018 Workshops.

**Transmission Service Market Reference
Priced Rates Application**

October 31, 2019

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Appendix A Draft Orders

Appendix B Amended Freshet Rate RS 1892 (On-going) Clean and Black-Lined

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1 Introduction

2 1.1 Introduction, Purpose of Application and Orders Sought

3 BC Hydro files its Transmission Service Market Reference-Priced Rates Application
4 with the British Columbia Utilities Commission (**Commission** or **BCUC**) pursuant to
5 sections 58 to 60 of the *Utilities Commission Act (UCA)* to request orders as
6 summarized in sections [1.1.1](#) and [1.1.5](#) below.

7 1.1.1 Purpose of Application

8 The purpose of this application is to seek approval of, pursuant to sections 58 to 60
9 of the UCA:

- 10 (i) An amended Freshet Rate (RS 1892) effective April 1, 2020 on an ongoing
11 basis as contained in **Appendix B** in compliance with Directive 4 of BCUC
12 Order G-106-19 dated May 22, 2019, as revised by BCUC Order No. G-224-19
13 dated September 13, 2019; and
- 14 (ii) The Incremental Energy Rate Pilot (RS 1893) on a pilot basis for a total of
15 51 months beginning January 1, 2020 and ending March 31, 2024 (the end of
16 BC Hydro's fiscal year), as contained in **Appendix C**.

17 BC Hydro is also submitting an evaluation report for the Freshet Rate Pilot for 2019
18 in compliance with Directive 3 of BCUC Order No. G-106-19 as contained in
19 **Appendix E**.

20 Both the Freshet Rate and Incremental Energy Rate Pilot are for the provision of
21 optional non-firm, interruptible electricity service to transmission service customers¹
22 supplied with electricity under Rate Schedule 1823 (RS 1823) or Rate Schedule
23 1828 (RS 1828), as applicable. RS 1823 is BC Hydro's default rate for firm electricity
24 service supplied to transmission customers. RS 1828 is BC Hydro's rate for firm

¹ BC Hydro's transmission service customers are those customers taking electricity service at 60 kV or higher.

1 electricity service supplied to transmission customers with self-generation who have
2 entered into a contract with BC Hydro under its Biomass Energy Program.

3 Service under the proposed Freshet Rate and Incremental Energy Rate Pilot is only
4 available to customers for incremental electricity consumption above the customer's
5 normal historical baseline levels of electricity usage. The baselines are intended to
6 represent the customer's normal expected electricity usage in the absence of
7 making the Freshet Rate or Incremental Energy Rate Pilot available to them.

8 The proposed Freshet Rate and Incremental Energy Rate Pilot have been designed
9 to:

- 10 (a) Provide opportunities for transmission service customers to operate their idle
11 and/or flexible production capacity that in the absence of these rates would be
12 underutilized;
- 13 (b) Provide benefits to all ratepayers by setting pricing that is generally sufficient to
14 cover, on an expected basis, BC Hydro's marginal cost of energy² and make
15 some contribution to fixed costs;³
- 16 (c) Minimize risk to all ratepayers by not requiring BC Hydro to undertake system
17 reinforcements and not requiring BC Hydro to provide service if the electrical
18 system is constrained for technical reasons such as forced or planned outages
19 of its transmission or generation system. For greater certainty, BC Hydro does
20 not propose to interrupt these non-firm services for economic reasons; and

² As described in section [5.5.1](#), 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. BC Hydro's analysis takes into account uncertainties in various inputs such as forecasted inflows, electricity and gas prices, loads and operational constraints. The rates have been designed to cover the marginal cost of energy and provide a contribution to fixed costs on an expected value basis (determined by positive expected net revenue in the analysis), which is determined by the probability weighted average of all values.

³ Fixed costs are those that do not vary according to changes in electricity usage (and production) within a period of time. For a regulated electric utility, this may include, for example, the cost of delivery infrastructure.

1 (d) Minimize risk to participating customers by making these rates optional and
2 continuing to provide participating customers with firm service at stable pricing
3 under RS 1823 or RS 1828, as applicable.

4 Both the proposed Freshet Rate and the Incremental Energy Rate Pilot offer
5 optional, interruptible service. The main distinctions are as follows:

- 6 • The Freshet Rate is offered for the freshet period of May to July only, whereas
7 the Incremental Energy Rate Pilot would be offered on a year-round basis;
- 8 • The Freshet Rate uses seasonal baselines with seasonal billing settlement,
9 whereas the Incremental Energy Rate Pilot uses monthly baselines with
10 monthly billing settlement; and
- 11 • The Incremental Energy Rate Pilot has a proposed energy charge adder of
12 \$7/MWh during the non-freshet months that is significantly higher than the
13 energy charge adder of \$3/MWh during the freshet months.

14 The Freshet Rate was initially offered as a pilot for three years, from 2016
15 through 2018, and subsequently extended to include a fourth year (2019). Over this
16 period, the pilot was successful for participants and BC Hydro. Accordingly,
17 BC Hydro is proposing to offer the Freshet Rate on an ongoing basis under
18 substantially the same terms and conditions as the pilot, with minor changes of an
19 administrative nature only.

20 In response to customer feedback, BC Hydro is also proposing to introduce the
21 Incremental Energy Rate Pilot. Since the Incremental Rate Pilot is new to BC Hydro
22 and to our customers, BC Hydro is proposing a pilot period of 51 months, effective
23 January 1, 2020 and ending March 31, 2024, with annual monitoring and submission
24 of an evaluation report to the BCUC in fall 2023. The evaluation report will
25 encompass three full fiscal years of rate operations (i.e., fiscal 2021, fiscal 2022 and
26 fiscal 2023) plus the initial period of January 1, 2020 to March 31, 2021.

1 The Incremental Energy Rate Pilot is a very similar design to the Freshet Rate. It
2 incorporates key feedback received from customers such as year-round availability
3 and monthly baselines with monthly billing settlement. A key difference is the
4 proposed energy charge adder in non-freshet months compared to freshet months.
5 BC Hydro considers that there is an elevated risk of not recovering all of its marginal
6 costs of providing incremental service under the Incremental Energy Rate Pilot. This
7 is due primarily to the potential variability in system marginal value and market
8 energy costs, over a 365-day period, relative to the revenue received for incremental
9 energy purchases. BC Hydro considers that the proposed energy adder of \$7/MWh
10 in non-freshet months, coupled with the \$3/MWh energy charge adder in freshet
11 months, will be sufficient to mitigate the risk associated with this variability on an
12 expected basis.

13 **1.1.2 Freshet Rate**

14 As discussed above, BC Hydro is applying for approval of an amended Freshet Rate
15 – Rate Schedule 1892 (RS 1892) effective April 1, 2020 on an ongoing basis as
16 contained in **Appendix B**.

17 The previously approved Freshet Rate is an optional rate for non-firm, interruptible
18 electricity service above normal RS 1823 baseline amounts during a historical
19 freshet period commencing May 1 and ending July 31. The previously approved
20 Freshet Rate was initially offered on a three-year pilot basis for the freshet periods of
21 2016, 2017 and 2018. It was subsequently extended to include the freshet period of
22 2019. The rate will terminate on December 31, 2019.

23 BC Hydro is applying for the amended Freshet Rate to be made available on an
24 ongoing basis, commencing April 1, 2020 with no fixed termination date, for the
25 following reasons:

-
- 1 • The previously approved Freshet Rate was successful in terms of customer
2 participation, incremental energy sales and positive ratepayer impact over the
3 pilot period. Over the four-year pilot period the Freshet Rate:
- 4 ▶ Had participation from approximately 30 per cent of eligible RS 1823
5 customers;
- 6 ▶ Increased domestic energy sales by 569 GWh and gross revenues by
7 \$14.9 million; and
- 8 ▶ Resulted in a net revenue gain of \$5.8 million;⁴
- 9 • BC Hydro is not proposing any changes to the Freshet Rate design, pricing or
10 structure. The amendments to the Freshet Rate proposed by BC Hydro are
11 minor and reflect house-keeping updates and new terms and conditions to
12 improve clarity and customer understanding only;
- 13 • Evaluation results for the Freshet Rate pilot show that there have been
14 ratepayer and participant benefits. The amended Freshet Rate is expected to
15 continue to provide benefits to participants and ratepayers if Mid-Columbia
16 (**Mid-C**) market prices and BC Hydro's marginal cost of energy are similar to
17 the conditions experienced over the four-year pilot period;⁵
- 18 • BC Hydro has consulted extensively with its existing transmission service
19 customers and the Association of Major Power Customers (**AMPC**). They
20 support the Freshet Rate being offered on an ongoing basis.

⁴ The revenue gain has not been adjusted for implementation costs and any verified load-shifting impacts. Implementation costs for Years 1 to 3 and load shifting impacts for Year 1 and 2 are described in section 3.1.6 and 3.1.7, respectively, of BC Hydro's Freshet Rate Pilot Final Evaluation Report. Implementation costs for Year 4 are described in section 1.8.2 of the 2019 Evaluation Report for Year 4. Load shifting impacts for Year 3 and Year 4 have not been assessed.

⁵ In its Freshet Rate Pilot evaluation reports, BC Hydro's analysis of ratepayer benefit is based on an economic analysis of daily supply operations and the marginal resource used to serve RS 1892 energy volumes during each day of the Pilot. BC Hydro's analysis in section [5.5.1](#) for the Incremental Energy Rate Pilot incorporates uncertainty of various inputs over the forecast period and shows that although the expected revenue gain is positive, there is a range of possible outcomes.

1 1.1.3 Incremental Energy Rate Pilot

2 The Incremental Energy Rate Pilot (RS 1893) contained in **Appendix C** is a
3 proposed new optional rate that would be offered on a non-firm, interruptible basis
4 for electricity usage above normal monthly baseline amounts for energy and
5 demand. Similar to the Freshet Rate, no demand charge is proposed for service
6 provided pursuant to RS 1893 because the service is non-firm and BC Hydro will not
7 construct system reinforcements to enable service. Energy pricing would be
8 referenced to daily Mid-C market prices, plus an additional energy charge adder for
9 margin and risk of \$7/MWh in non-freshet months and \$3/MWh in freshet months.
10 Unlike the Freshet Rate, which is limited to the months of May through July, the
11 Incremental Energy Rate Pilot would be available on a year-round basis.

12 BC Hydro is applying for the Incremental Energy Rate Pilot to be offered for a
13 51-month pilot period, commencing January 1, 2020 and ending March 31, 2024, for
14 the following reasons:

- 15 • BC Hydro does not presently have a rate schedule for the provision of non-firm,
16 interruptible electricity that is available to all RS 1823 and RS 1828
17 transmission customers on a year-round basis. RS 1853 is only for Independent
18 Power Producers; RS 1880 is only for customers with self-generation; RS 1891
19 is only for port customers with shore power facilities; and RS 1892 is only for
20 the freshet period of May through July;
- 21 • Transmission service customers have requested flexible rate options that better
22 match their unique operating needs and electricity service requirements. In this
23 respect, Customers and AMPC identified the annual availability of non-firm
24 service with market-referenced pricing and monthly settlement as a key
25 objective during the consultation process. The Incremental Energy Rate Pilot is
26 responsive to this feedback;

-
- 1 • The Incremental Energy Rate Pilot is also responsive to the 2013 Industrial
2 Electricity Policy Review (**IEPR**) taskforce recommendations to develop
3 innovative rate options for industrial customers.⁶ More recently, the
4 Government of B.C.'s Comprehensive Review of BC Hydro: Phase 1 Final
5 Report (February 2019) indicated that BC Hydro is pursuing strategies to grow
6 domestic electricity demand including “exploring the option to offer current
7 industrial customers year-around access to real time, market-based pricing for
8 incremental energy purchases”;⁷
- 9 • The Incremental Energy Rate Pilot is similar in concept and design to the
10 Freshet Rate, but would be offered on a year-round basis. BC Hydro expects
11 that some customers will prefer the seasonal Freshet Rate, while others will
12 prefer the annual Incremental Energy Rate Pilot. Having both rates available
13 will provide transmission service customers with choice during the proposed
14 pilot period. It will also permit direct observation of customer preferences and
15 specific actions taken to increase load;
- 16 • Some customers now have up to four years of experience with the Freshet
17 Rate. They understand the rate concept and have demonstrated that they can
18 plan for - and achieve - incremental production over the three-month freshet
19 period. However, certain customers have advised that they would prefer an
20 annual rate option with monthly baselines and monthly settlement. Such
21 customers have indicated that they have the capability, the resources and the
22 operational sophistication to increase electricity use at any time during the year
23 when economic to do so and the Incremental Energy Rate Pilot helps to
24 address this opportunity;

⁶ The 2013 IEPR task force process culminated in 17 recommendations to the provincial government. Recommendation 13 of the IEPR task force final report stated: “*BC Hydro should work with its industrial customers and the Commission to develop options that take advantage of industrial power consumption flexibility*”.

⁷ Refer to the following link for the report. The quote is from page 33:
https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/electricity/bc-hydro-review/final_report_desktop_bc_hydro_review_v04_feb12_237pm-r2.pdf.

-
- 1 • BC Hydro has experience with the use of market-referenced energy pricing to
2 encourage incremental electricity use on a non-firm basis. The previously
3 approved Freshet Rate provided customers with a Mid-C market energy price
4 signal for incremental energy consumption above approved baselines. That rate
5 demonstrated support, understanding and acceptance from customers as
6 evidenced by strong participation. It also demonstrated participant and
7 ratepayer benefits. Consistent with this experience and these results, BC Hydro
8 expects the proposed Incremental Energy Rate Pilot will provide benefits to
9 both participants and non-participant ratepayers; and
- 10 • BC Hydro has conducted extensive consultation with both existing and
11 prospective new transmission service customers and AMPC. There is strong
12 customer support for the optional Incremental Energy Rate Pilot to be offered
13 on a pilot basis.

14 BC Hydro proposes to prepare an evaluation of the Incremental Energy Rate Pilot in
15 fall 2023 after the results for the initial period (January 1, 2020 to March 31, 2020)
16 and three complete fiscal years (i.e. fiscal 2021, fiscal 2022 and fiscal 2023) are
17 available. BC Hydro proposes that the evaluation will consider the following:

- 18 (i) Ratepayer and participant economics;
- 19 (ii) Appropriateness of the energy charge adder;
- 20 (iii) Customer understanding and acceptance;
- 21 (iv) Practicality of administration; and
- 22 (v) Interactions and possible opportunities for synergies between the Incremental
23 Energy Rate Pilot and the Freshet Rate.

24 **1.1.4 Legal Regime for Rate-setting**

25 The rate setting function of the BCUC is governed by sections 58 to 60 of the UCA:

-
- 1 • Section 58 of the UCA addresses the process by which the BCUC is engaged
2 to determine (on its own motion or on application by a public utility or interested
3 person) that existing rates in effect or any rates charged or attempted to be
4 charged for a service by a public utility are unjust, unreasonable, insufficient,
5 unduly discriminatory or in contravention of the UCA, the regulations or any
6 other law. The BCUC may, after a hearing, determine the just, reasonable and
7 sufficient rates to be observed and in force. Pursuant to subsection 58(2), if the
8 BCUC makes such a determination, the BCUC must, by order, set the rates;
- 9 • Section 58.1 of the UCA addresses rate-rebalancing, and is not applicable to
10 this application;
- 11 • Subsections 59(1) to (4) and section 60 inform the BCUC’s decision-making
12 and specify the criteria the BCUC is to consider in setting rates. Section 60 also
13 provides for a public utility to have different classes of service; and
- 14 • Subsection 59(5) specifies the circumstances in which a rate is “unjust” or
15 “unreasonable”.

16 The BCUC has considerable discretion in designing rates pursuant to sections 59
17 and 60 of the UCA. Subsection 60(1)(b) provides that in setting a rate under the
18 UCA the BCUC “must have due regard to the setting of a rate that: (i) is not unjust
19 and unreasonable within the meaning of section 59; (ii) provides the public utility for
20 which the rate is set a fair and reasonable return on any expenditure made by it to
21 reduce energy demand; and (iii) encourages public utilities to increase efficiency,
22 reduce costs and enhance performance”.

23 Direction No. 8 to the BCUC, which became effective on February 14, 2019,
24 contains no requirements for the BCUC in designing rates for BC Hydro’s
25 transmission service customers (unlike its predecessor – Direction No. 7 to the
26 BCUC). Sections 58 to 60 of the UCA specify the criteria and matters the BCUC is to

1 consider and apply in determining whether to set the rates applied for in this
2 application.

3 Direction No. 8 continues the prohibition on BC Hydro offering retail access.⁸ The
4 Freshet Rate and the Incremental Energy Rate Pilot do not provide customers with
5 retail access. Rather, these rates are for an optional service provided by BC Hydro
6 for incremental energy use with transparent market-referenced pricing.

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

17 In the remainder of this application, the legal test that BC Hydro will refer to for
18 whether the rates proposed in this application should be approved is whether they
19 are 'fair, just, reasonable and not unduly discriminatory'.

20 **1.1.5 Order Sought**

21 BC Hydro seeks an order as further described below. Further details on the
22 requested order and timing are provided below in section [1.2](#).

23 1. Approval of the amended Freshet Rate effective April 1, 2020

⁸ In this context, retail access would be the ability of customers to secure generation services from the wholesale market by a third-party provider rather than from BC Hydro.

1 BC Hydro seeks an order approving the amended Freshet Rate (RS 1892 –
2 Transmission Service – Freshet Energy) as shown in the clean and black-lined rate
3 schedules contained in **Appendix B** of this application effective April 1, 2020. The
4 amended Freshet Rate includes proposed minor housekeeping amendments and
5 new terms and conditions, and would be available on an ongoing basis. A draft order
6 is contained in **Appendix A**.

7 2. Approval of the Incremental Energy Rate Pilot on a 51-month pilot basis
8 effective January 1, 2020

9 BC Hydro seeks an order approving the Incremental Energy Rate Pilot (RS 1893 –
10 Transmission Service – Incremental Energy Rate) as shown in the rate schedule
11 contained in **Appendix C** of this application on a pilot basis for 51 months, effective
12 January 1, 2020 and ending on March 31, 2024. The pilot period includes an initial
13 period of a partial fiscal year from January 1, 2020 to March 1, 2021, and four full
14 fiscal years (fiscal 2021, fiscal 2022, fiscal 2023 and fiscal 2024).

15 BC Hydro's request for the effective date of January 1, 2020 is based on a request
16 by AMPC and certain customers that this service option be available by then.
17 BC Hydro supports this request and confirms that it would be possible to determine
18 customer baselines and implement billing with 30 days prior notice if such an
19 effective date is approved by the BCUC. For greater certainty, to implement
20 RS 1893 on an interim basis effective January 1, 2020, BC Hydro would require the
21 BCUC's Order approving such effective date by November 29, 2019.

22 Given the limited time for this application to be reviewed before November 29, 2019,
23 BC Hydro respectfully requests that the approval of RS 1893 with an effective date
24 of January 1, 2020 be made on an interim and non-refundable basis. The BCUC
25 may then issue a final order regarding RS 1893 once the regulatory process for this
26 application concludes. BC Hydro is proposing that the interim rate be approved on a
27 non-refundable basis, because customers will be making operating decisions based

1 on the interim rate and they require certainty that the rate will not be changed
2 retroactively.

3 The addition of RS 1893 into BC Hydro's Electric Tariff would result in changes to
4 the Table of Contents and a pagination change to RS 3808 and RS 3817. These are
5 purely tariff administrative changes. Accordingly, the draft order also includes
6 direction to BC Hydro to file all updated tariff sheets regarding the Incremental
7 Energy Rate Pilot proposal within 15 business days of the date of the Commission
8 order.

9 **1.2 Proposed Regulatory Review Process and Communications**

10 BC Hydro proposes that a single regulatory process be established for both rates for
11 the following reasons:

- 12 • The Freshet Rate has been tested over a four-year pilot period, with four
13 evaluations and extensive customer consultation;
- 14 • The design and structure of the Incremental Energy Rate Pilot is very similar to
15 the Freshet Rate with which BC Hydro and customers have four years of
16 experience;
- 17 • BC Hydro held stakeholder workshops on both rates in October 2018,
18 November 2018 and September 2019 – comprehensive feedback was sought,
19 provided, carefully considered and (where appropriate) incorporated into this
20 application;
- 21 • There has been extensive consultation with individual customers, Ministry of
22 Energy, Mines and Petroleum Resources (**MEMPR**) and AMPC since 2016;
23 and
- 24 • BC Hydro believes that customers, MEMPR and AMPC support the rates
25 proposed, as evidenced by the letters of support contained in **Appendix F**.

1 Accordingly, BC Hydro proposes a regulatory process of one round of BCUC and
 2 intervener information requests (**IRs**), followed by written argument.

3 A process would be required to obtain stakeholder comment on the proposal for an
 4 interim and non-refundable Incremental Energy Rate Pilot effective January 1, 2020.

5 An interim order would be required at least thirty days in advance of the effective
 6 date to provide sufficient time for BC Hydro to enrol participants, determine customer
 7 baselines and implement billing.

8 [Table 1](#) below outlines a proposed schedule for this process.

9 **Table 1 Proposed Regulatory Review Process for**
 10 **Freshet and Incremental Energy Rates**

Process	Date
Filing of Application	October 31, 2019
Intervener and stakeholder letters of comment on interim proposal	November 15, 2019
Interim order approving Incremental Energy Rate Pilot on an interim and non-refundable basis	By November 29, 2019
BCUC and intervener information requests on amended Freshet Rate and Incremental Energy Rate Pilot	November 29, 2019
BC Hydro responses to information requests	December 20, 2019
Regulatory Process TBD	
BCUC Decision on Freshet Energy Rate	By February 28, 2020
BCUC Decision on Incremental Energy Rate Pilot	By February 28, 2020

2 Background

This section summarizes prior BCUC decisions, and filed evaluation reports, for BC Hydro's market reference-priced rates that are relevant to this application. It also provides an overview of the rate design criteria applied by BC Hydro.

2.1 Prior BCUC Decisions

2.1.1 BC Hydro's 1996 Industrial Service Options (ISO) Application

The 1996 ISO application is relevant because the BCUC approved BC Hydro's proposed Real Time Pricing (RTP) RS 1848 on July 17, 1996 as part of that application.⁹ At the time, market energy prices were generally lower than BC Hydro's standard rates for transmission service customers (then RS 1821) and customers were seeking expanded service offerings from BC Hydro. The RTP rate was designed to provide participant customers with access to market referenced prices for marginal consumption. The BCUC initially approved RS 1848 for a one-year pilot period¹⁰ and directed BC Hydro to examine various aspects of the rate in an evaluation report.

In September 1997, BC Hydro filed its RTP Evaluation Report¹¹ and an application for the RTP rate to continue on an ongoing basis, with some amendments. The BCUC approved the application by BCUC Order No. G-114-97 on November 12, 1997.

In subsequent years, up to 30 transmission service customers (out of a total of 100 eligible customers) were enrolled under RS 1848. However, following the

⁹ Please refer to BCUC Order No. G-76-96. The BCUC decision can be found at the following link: https://www.bcuc.com/Documents/Decisions/1996/DOC_263_07-17-1996_BCH_Industrial%20Service%20Options%20Application.pdf

¹⁰ RTP was subsequently extended into a second year to provide sufficient time for BC Hydro to prepare and file its RTP Evaluation Report and Application to Amend RTP.

¹¹ The RTP Evaluation Report concluded that: "... RTP has achieved its objective to provide participant customers with generally low market prices, while maintaining their fair contribution to embedded cost. RTP's success is evidenced by its proven ability to retain and promote sales, with the ensuing outcome of incremental revenue."

1 2000/2001 crisis in the Western power market, all enrolled RS 1848 customers went
2 back to the standard RS 1821 service and there was no subsequent take-up.

3 In March 2005, BC Hydro applied to terminate RS 1848 as part of its
4 2005 Transmission Service Rate Application, which the BCUC approved in
5 BCUC Order No. G-79-05.

6 **2.1.2 2015 Rate Design Application (2015 RDA) Freshet Rate Pilot**

7 As part of its 2015 RDA, BC Hydro proposed the Freshet Rate (RS 1892), which
8 was a new optional rate to provide customers with market-referenced pricing for
9 electricity consumption above historical RS 1823 levels, on a non-firm interruptible
10 basis during the freshet period of May through July only.

11 The BCUC initially approved the Freshet Rate as a two-year pilot ending in
12 December 31, 2017 and directed BC Hydro to file the three evaluation reports as
13 described in section 7.3.4.6 of the 2015 RDA by Order No. G-17-16 issued on
14 February 9, 2016. Directive 4 of the Order also directed additional criteria for
15 BC Hydro to address as part of the evaluation process.

16 Directive 5 of the Order directed that, prior to filing the final evaluation report on the
17 Freshet Rate pilot, BC Hydro was to consult with stakeholders on further process in
18 the event there is a recommendation that the Freshet Rate be made permanent.

19 **2.1.2.1 Freshet Rate Pilot Year Three Extension BCUC Order No. G-45-18**

20 In compliance with BCUC Order No. G-17-16, BC Hydro filed its preliminary
21 evaluation report for Year 1 on December 8, 2016 (Appendix D to the Year 1 report
22 was filed on January 27, 2017) and its preliminary evaluation report for Year 2 on
23 December 8, 2017. As part of the latter filing, BC Hydro applied to extend the
24 termination date of the Freshet Rate pilot to include a third year so that the rate
25 schedule would expire on December 31, 2018. BC Hydro also proposed to extend
26 the timeline for filing the final Freshet Rate Pilot Final Evaluation Report from the

1 spring of 2018, as outlined in the 2015 RDA, to the fall of 2018. The BCUC approved
2 these requests by Order No. G-45-18 issued on February 28, 2018.

3 **2.2 Freshet Rate Pilot Evaluation Reports**

4 BC Hydro filed the Freshet Rate Pilot Final Evaluation Report (**Final Evaluation**
5 **Report**) in compliance with BCUC Order Nos. G-17-16 and G-45-18 on
6 December 17, 2018. The Final Evaluation Report is contained in **Appendix D** of this
7 application. It includes the evaluation reports for each of the first three years of the
8 Freshet Rate pilot (i.e., 2016, 2017 and 2018). As part of this application, BC Hydro
9 is also submitting its 2019 Evaluation Report for Year 4 of the Freshet Rate Pilot in
10 compliance with Directive 3 of BCUC Order No. G-106-19 issued on May 22, 2019.
11 The 2019 Evaluation Report for Year 4 is contained in **Appendix E**.

12 **2.2.1 Summary of Findings**

13 As described in section 1 of the Final Evaluation Report, BC Hydro considers that
14 the Freshet Rate pilot was successful. Key success metrics are: (1) customer
15 take-up/participation; (2) incremental energy sales and revenue; and (3) positive
16 ratepayer impact. BC Hydro has updated these results from the Final Evaluation
17 Report to incorporate the results from the 2019 Evaluation Report for Year 4. In
18 summary, over the four years of the pilot:

- 19 (i) Approximately 30 per cent of eligible customers participated in the Freshet Rate
20 pilot from a broad cross-section of industry;
- 21 (ii) Domestic energy sales increased by 569 GWh and revenue from participant
22 customers increased by \$14.8 million; and
- 23 (iii) There was an estimated net revenue gain of \$5.8 million, before adjustment for
24 implementation costs and/or verified load shifting impacts.

1 **2.2.2 Implications for the Application**

2 In the Final Evaluation Report, BC Hydro stated its view that the existing rate design
3 is effective and should continue. As described above, there was participation in the
4 Freshet Rate pilot from a broad cross-section of industry sectors including solid
5 wood, pulp and paper, mining, oil and gas, electrochemical and cement. The Freshet
6 Rate was effective in providing customers with a transparent market-referenced
7 pricing option for incremental energy use that provided financial benefits to both
8 participants and non-participants. The design minimized load shifting and
9 demonstrated broad customer understanding and acceptance. BC Hydro expects
10 the Freshet Rate will continue to provide similar benefits to participants and
11 ratepayers if future conditions and customer responses are similar to those
12 experienced during the pilot.

13 In its 2019 evaluation report, BC Hydro identifies that Year 4 of the Freshet Rate
14 Pilot did see a substantial change in conditions compared to Years 1 to 3.
15 Conditions in Year 4 were impacted by an electricity supply issue arising from the
16 explosion of the Enbridge Pipeline in October 2018 and low water inflows to
17 BC Hydro's reservoirs - both prior to and during the 2019 Freshet Period. These
18 factors contributed to a reduction in the freshet energy surplus, higher system
19 marginal prices and higher market energy imports. Given these conditions,
20 BC Hydro experienced negative net revenue in the 2019 Freshet Period. However,
21 the revenue loss of \$0.5 million was modest relative to total revenue gains of
22 \$6.3 million over the three prior freshet periods.

23 For the entire Freshet Rate Pilot period, the estimated net revenue gain is
24 \$5.8 million before adjustment for implementation costs and load shifting impacts.
25 BC Hydro considers this result to demonstrate that the Freshet Rate design, when
26 assessed over multiple years, is able to prudently and efficiently drive incremental
27 energy sales from participant customers while protecting the interests of
28 non-participant ratepayers.

1 Further, BC Hydro conducted extensive customer consultation on the Freshet Rate
2 pilot and asked whether the rate should be made permanent. Customers advised
3 their clear support for having the Freshet Rate made permanent as described in
4 section 4.2 of the Final Evaluation Report and summarized in sections [3.3](#) and [3.3.1](#)
5 of this application and **Appendix G** (Engagement Summary Reports). Accordingly,
6 BC Hydro concludes that seeking the BCUC's approval to offer the Freshet Rate on
7 an ongoing basis is appropriate.

8 **2.3 Rate Design Principles and Criteria**

9 In its decision concerning BC Hydro's 2008 Residential Inclining Block application,
10 the BCUC found Bonbright's eight rate design criteria¹² to be consistent with the
11 UCA test of 'fair, just and not unduly discriminatory' and to form an appropriate
12 foundation for rate structures.¹³ These criteria are generally accepted principles for
13 utility rate-making.

14 In the 2015 RDA, BC Hydro grouped the eight rate design criteria into
15 four categories for stakeholder engagement purposes: (1) economic efficiency;
16 (2) fairness; (3) practicality; and (4) stability. BC Hydro has used the Bonbright
17 criteria to evaluate each of the rates proposed in this application and has also
18 included the four categories in its reported assessment. An assessment of the
19 proposed rates using the Bonbright criteria can be found in section [4.4](#) of this
20 application for the Freshet Rate and section [5.6](#) for the Incremental Energy Rate Pilot.

21 Consistent with the Bonbright criteria, BC Hydro communicated its guiding
22 principles¹⁴ for rate design in the October 2018 customer and stakeholder
23 engagements (which are described in section [3.1](#) of this application) as follows:¹⁵

¹² James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (2nd Edition; Public Utilities Report, Inc.: Arlington, Virginia, 1988), pages 383 to 384.

¹³ In the Matter of British Columbia Hydro and Power Authority: Residential Inclining Block Rate Application, Reasons for Decision to BCUC Order No. G-124-08, dated September 24, 2008, page 51.

¹⁴ Refer to BC Hydro's October 2018 workshop presentation in Appendix F in this application.

-
- 1 • No harm to participant and non-participant ratepayers (fairness);
- 2 • No undue discrimination – rates are fair and free from controversy (fairness);
- 3 and
- 4 • Rates are practical to implement and accepted by customers (practicality).

5 BC Hydro also communicated at those engagements the following rate design

6 principles for market reference-priced rates:

- 7 • Provide an annual non-firm service option for incremental consumption using
- 8 market-reference priced energy (economic efficiency);
- 9 • Fair, consistent, transparent design and customer application (practicality);
- 10 • Optimize benefits to all ratepayers (fairness); and
- 11 • Market pricing should be available, transparent, accurate and verifiable
- 12 (stability).

13 BC Hydro confirms that it has incorporated these rate design principles and criteria

14 into its proposals for the Freshet Rate and the Incremental Energy Rate Pilot. Based

15 on this assessment, BC Hydro submits that the proposed rates are fair, just and not

16 unduly discriminatory.

17 **3 Engagement with Customers and Stakeholders**

18 **3.1 Engagement Overview**

19 Since the Freshet Rate was approved by the BCUC in February 2016 as part of the

20 2015 RDA, BC Hydro has conducted broad province-wide engagement with

21 RS 1823 customers, AMPC and stakeholders on market reference-priced rates.

22 Engagement activities included the following:

¹⁵ BC Hydro's 2015 RDA criteria grouping has been added in brackets next to the guiding principles to show the relationship to the Bonbright criteria.

-
- 1 • Annual province-wide customer engagement workshops;¹⁶
 - 2 • Annual Freshet Rate participant customer surveys;¹⁷
 - 3 • Individual customer meetings;
 - 4 • 17 separate meetings with AMPC;¹⁸
 - 5 • Four industrial rate design workshops held in October 2018;¹⁹
 - 6 • One industrial rate design workshop held on November 19, 2018;¹⁹ and
 - 7 • Four industrial rate design workshops held in September 2019.¹⁹

8 In general, the purpose of these engagement activities was to: (a) provide information
9 and education about BC Hydro's transmission service rates; (b) encourage customer
10 participation for the Freshet Rate; (c) seek and consider feedback regarding various
11 aspects of the Freshet Rate pilot, including the possibility of making the rate
12 permanent; and (d) seek and consider feedback regarding the advancement of other
13 industrial rate designs, such as the proposed Incremental Energy Rate Pilot.

14 **3.2 Industrial Rate Design Workshops**

15 The industrial rate design workshops held in October and November 2018, and
16 subsequently in September 2019, were specifically designed to obtain feedback
17 from customers and stakeholders on the two market reference-priced rates which
18 are the subject of this application: the Freshet Rate and the Incremental Energy
19 Rate Pilot.

¹⁶ Customer workshops were held in February 2016, February 2017 and November 2017 across the province.

¹⁷ Sent in September of each year to participant customers (i.e., September 2016, 2017, 2018 and 2019) after Freshet Rate billing was completed.

¹⁸ A total of 17 separate meetings were held with AMPC between March 9, 2017 and October 03, 2019.

¹⁹ Refer to Appendix G for a copy of the Engagement Summary Reports from these workshops.

-
- 1 • Invitations to attend the October and November 2018 rate design workshops
2 were sent to existing transmission service customers, prospective new
3 customers, registered interveners and interested parties;
- 4 • Invitations to attend the September 2019 rate design workshops were sent to
5 existing transmission service customers, prospective new customers and
6 industrial customer stakeholder groups; and
- 7 • The workshops were presented by BC Hydro staff. There was no charge to
8 attend.

9 BC Hydro received verbal and written feedback on its rate proposals from workshop
10 participants as described below:

- 11 • Verbal feedback was provided to BC Hydro in the workshops and captured in
12 minutes which BC Hydro has termed “Summary Notes”:
- 13 • Written feedback was provided to BC Hydro via feedback forms. Written
14 feedback included responses to survey questions plus additional written
15 comments; and
- 16 • For the September 2019 workshops, BC Hydro recorded the results to live
17 polling questions that were incorporated into the workshop presentation.

18 BC Hydro carefully reviewed and considered all feedback received. Where
19 appropriate, feedback has been incorporated into BC Hydro’s proposed rate
20 designs. The following sections provide an overview of BC Hydro’s rate design
21 workshops and feedback received.

22 **3.2.1 October 2018 Rate Design Workshops**

23 The October 2018 workshops were attended by a total of 105 participants, not
24 including BC Hydro staff. Forty-six of these participants submitted a written feedback
25 form to BC Hydro. Refer to [Table 2](#) below.

1 **Table 2 October 2018 Workshops**

WORKSHOP LOCATION	NO. OF ATTENDEES	FEEDBACK FORMS RECEIVED
Vancouver (in person)	49	30 (in-person and webcast)
Vancouver (webcast)	27	
Prince George	13	8
Kamloops	10	6
Calgary	6	2
TOTAL	105	46

 2 **3.2.2 November 2018 Rate Design Workshop**

 3 The November 2018 workshop was attended by a total of 55 participants, not
 4 including BC Hydro staff. Twelve of these participants submitted a written feedback
 5 form to BC Hydro. Refer to [Table 3](#) below.

 6 **Table 3 November 2018 Workshop**

WORKSHOP LOCATION	NO. OF ATTENDEES	Feedback Forms Received
Vancouver (in person)	25	12
Vancouver (webcast)	30	0
TOTAL	55	12

 7 **3.2.3 September 2019 Rate Design Workshops**

 8 The September 2019 workshops were attended by a total of 94 participants, not
 9 including BC Hydro staff. Forty-nine of these participants submitted a written
 10 feedback form to BC Hydro. Refer to [Table 4](#) below.

 11 **Table 4 September 2019 Workshop**

WORKSHOP LOCATION	DATE	NO. OF ATTENDEES	Feedback Forms Received
Prince George	September 16	19	19
Vancouver	September 17	45	13
Kamloops	September 18	9	7
Calgary	September 19	21	10
TOTAL		94	49

3.3 Summary of Feedback for the Freshet Rate

BC Hydro sought specific feedback on whether the Freshet Rate should continue at each of the October 2018, November 2018 and September 2019 workshops. The results are shown in the figures below. In general, both existing and prospective customers from a diverse cross-section of industry have confirmed their satisfaction with the Freshet Rate and wish it to continue.

Figure 1 Preference for Freshet Rate Continuance (October 2018 Workshop)

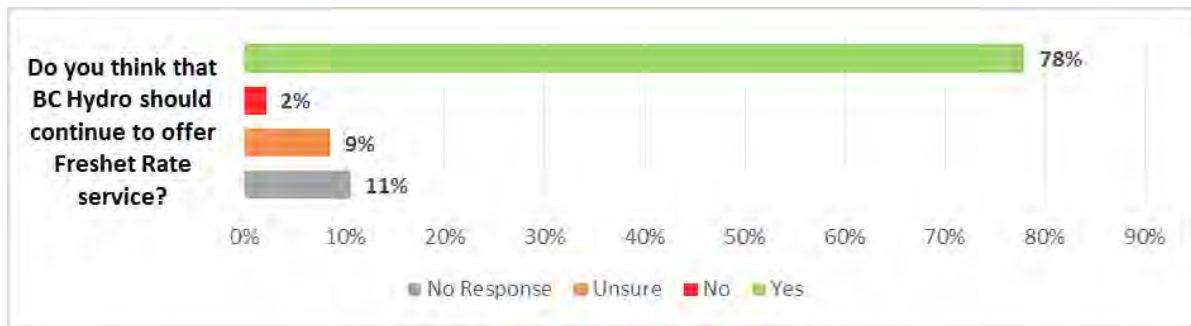
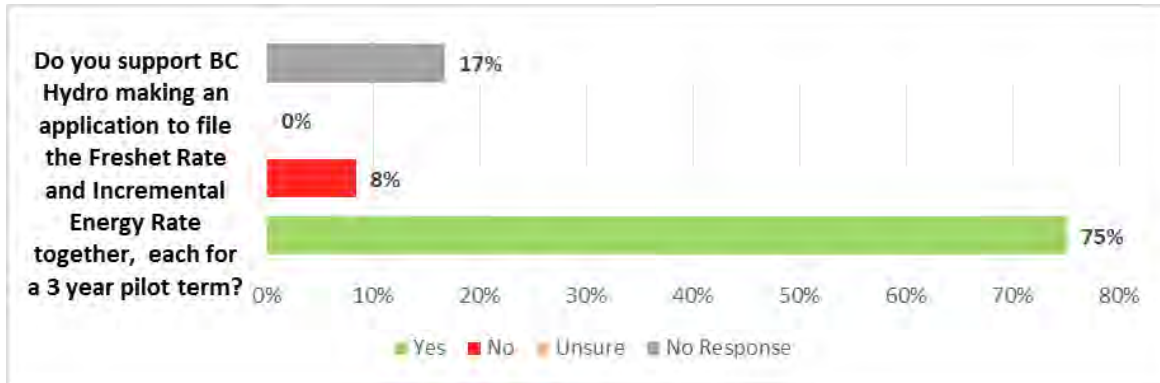


Figure 1 above shows the consolidated survey response from the October 2018 workshops regarding whether BC Hydro should continue to offer the Freshet Rate. Seventy eight per cent of respondents were in support. BC Hydro considers this response to demonstrate strong support for the Freshet Rate to be made available on an ongoing basis.

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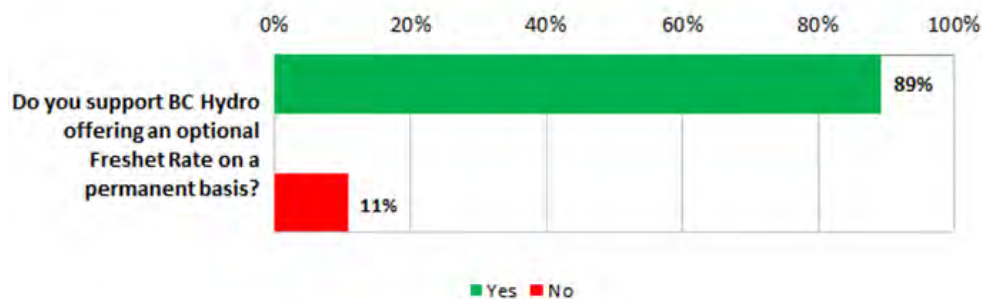
Figure 2 Support for Freshet Rate Continuance (November 2018 Workshop)



3 [Figure 2](#) above shows the consolidated survey response from the November 2018
4 workshop regarding whether BC Hydro should apply to the BCUC to offer the
5 Freshet Rate (together with the Incremental Energy Rate) for a second three year
6 pilot term. At that time, BC Hydro was targeting to file an application in winter
7 2018/19. Seventy five per cent of respondents were in support. BC Hydro considers
8 this response to demonstrate strong support for the Freshet Rate to be made
9 available on an ongoing basis.

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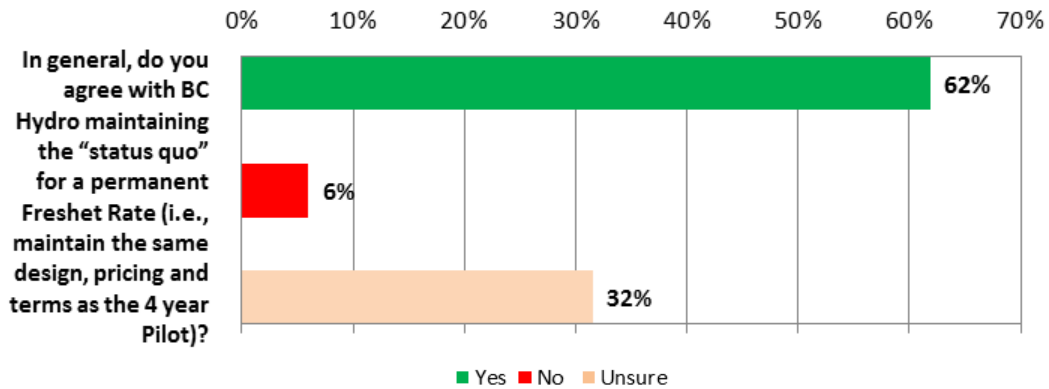
Figure 3 Support for Permanent Freshet Rate (September 2019 Workshop)



12 [Figure 3](#) above shows the consolidated poll response from the September 2019
13 workshops regarding whether BC Hydro should offer the Freshet Rate on a
14 permanent basis. Eighty nine per cent of respondents were in support. BC Hydro

1 considers this response to demonstrate strong support for the Freshet Rate to be
2 made available on an ongoing basis.

3 **Figure 4 Support for Freshet Rate Design**
4 **(September 2019 Workshop)**



5

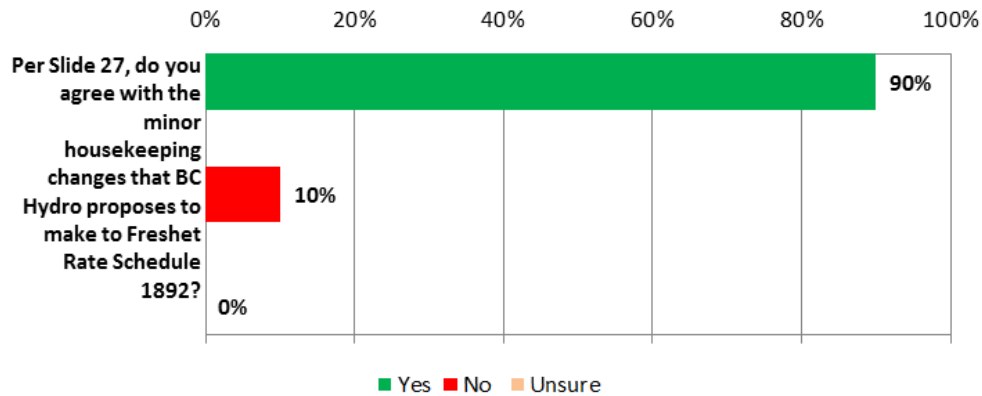
6 [Figure 4](#) above shows the consolidated polling response from the September 2019
7 workshops regarding whether BC Hydro should maintain the “status quo” rate
8 design, pricing and terms for the Freshet Rate that were in place for the four year
9 pilot between 2016 and 2019. Sixty two per cent of respondents agreed that the
10 status quo should be maintained. BC Hydro considers this response to demonstrate
11 a reasonable level of support²⁰ for the existing Freshet Rate structure and design.

12 For the 32 per cent of respondents that were unsure, BC Hydro sought confirmation
13 that, in general, the uncertainty was due to a lack of experience and/or familiarity
14 with the Freshet Rate from certain customer delegates that attended, such as
15 prospective new customers not yet taking service from BC Hydro.

²⁰ In general, the key issues raised by customers in relation to the Freshet Rate design are specific to the freshet period used and seasonal vs monthly billing settlement. BC Hydro has incorporated this feedback into the design of the Incremental Energy Rate Pilot.

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Figure 5 Support for minor Freshet Rate Amendments (September 2019 Workshop)



4 [Figure 5](#) above shows the consolidated poll response from the September 2019
5 workshops regarding support for two new provisions and four prospective
6 house-keeping amendments to RS 1892. The referenced “Slide 27” from BC Hydro’s
7 presentation is also shown in [Figure 6](#) below. 90 per cent of respondents agree with
8 the proposed changes. BC Hydro considers this response to demonstrate strong
9 support for the proposed minor amendments to RS 1892 which are included in this
10 application.

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Figure 6 “Slide 27” from September 2019
Workshop

PERMANENT FRESHET RATE PROPOSAL

HOUSEKEEPING CHANGES

- A. Redefine “wheeling rate” as “energy charge adder”
- B. Incorporate reference to Indirect Service provided under TS 87
- C. Redefine definition of HLH and LLH to be consistent with RS 1823 / RS 1828
- D. Confirm that any adjustments to default baselines would be made consistent with TS 74 and require BCUC approval

NEW PROVISIONS

- A. **Baseline determination:** (i) New customers will require at least 1yr of history that includes the Freshet Period; (ii) Where customers do not have 2015 consumption, the most recent Freshet Period will be used.
- B. **Change in site ownership:** (i) Baselines will transfer with the site; (ii) New owner can request adjustment if they operate differently (iii) Change in ownership DURING a freshet period will result in cancellation.

27

3.3.1 Customer Feedback Themes: Freshet Rate

A selection of written feedback from participant customers by industry segment is provided below. The feedback is excerpted from BC Hydro’s Engagement Summary Reports contained in **Appendix G**. BC Hydro considers this feedback to reflect broad customer support for the Freshet Rate to continue.

- **Solid wood:** “If this were a permanent program ... a case could be made to take a serious internal look at opportunities to increase load in these periods while adding production or operational benefits ...”
- **Mining:** “The freshet rate program has been beneficial to us and we support making it permanent.”

-
- 1 • **Electrochemical:** “If the Freshet Rate were to be made permanent, we could
2 ratchet up production to full capacity. We currently have about 60 GWh/yr of
3 energy that is not utilized.”
- 4 • **Pulp and Paper:** “If the Freshet Rate was made permanent, and with the move
5 towards electrification, we might opt to run more electric systems in place of
6 alternate fuels during the freshet period ...”

7 **3.3.2 Intervener Feedback Themes: Freshet Rate**

8 Interveners²¹ were invited to attend either or both of BC Hydro’s October 11, 2018
9 and November 19, 2018 industrial rate design workshops in Vancouver. A summary
10 of intervener feedback is provided below.²² BC Hydro has endeavoured to provide a
11 balanced representation of views expressed by interveners even where the
12 respondent may not have direct experience and/or familiarity with the rate. In
13 general, BC Hydro considers intervener feedback to reflect either support - or
14 indifference - for the Freshet Rate.

- 15 • Intervener feedback included that the Freshet Rate “supports low-carbon
16 electrification”, which puts “downward pressure” on BC Hydro rates, and is a
17 “win-win for BC Hydro, industrial customers and other rate classes”. There was
18 also support for a further three-year pilot approach.
- 19 • Feedback from the Canadian Association of Petroleum Producers (**CAPP**)
20 identified specific challenges related to participation from the oil and gas
21 industry. A key challenge is that certain members “... cannot leverage the
22 benefits of the freshet rate”. BC Hydro understands this comment to mean that
23 non-firm electricity service poses an unacceptable risk of interruption for some
24 natural gas processing and pipeline plant operations since these plants typically

²¹ Interveners that were invited include AMPC, BCSEA, BCOAPO, CEABC, CEC, City of New West, FortisBC, MoveUp, Non-Integrated Ratepayer Group and Zone II Ratepayer Group.

²² For the full text of participant comments, please refer to the Engagement Summary Reports for the October 11, 2018 and November 19, 2018 workshops contained in Appendix F.

1 require firm electricity service to meet production commitments. Gas plants are
2 also designed to run at or near maximum production capability such that there
3 is often no idle capacity available for incremental utilization. However,
4 BC Hydro notes that there was participation from natural gas processing
5 customers in each year of the pilot. For example, one customer chose to restart
6 shut-in gas wells during the freshet period when market referenced energy
7 prices made it economic to increase gas flows and production.

- 8 • Intervener feedback was provided that the Freshet Rate appears to be “an
9 awful lot of process for a very small program”. BC Hydro agrees that the
10 Freshet Rate was - and is proposed to remain as - a relatively small program.
11 The costs, benefits and risks are modest. Rate design, implementation and
12 management were achieved using existing staff resources.
- 13 • BC Hydro is also of the view that processes related to RS 1892 baseline
14 determination, adjustment and billing were well-understood and supported by
15 participant customers. No issues regarding these processes were raised.
16 BC Hydro considers the excellent level of participation achieved to support this
17 view (e.g., approximately 30 per cent of eligible customers from a broad
18 cross-section of industry participated in the Freshet Rate pilot).

19 **3.4 Summary of Feedback for the Incremental Energy Rate Pilot**

20 BC Hydro sought feedback on its proposed Incremental Energy Rate Pilot design,
21 structure, availability and criteria at each of the October 2018, November 2018 and
22 September 2019 workshops. The results are shown in the figures below.

23 BC Hydro carefully considered all feedback that it received. Where appropriate,
24 feedback has been incorporated into BC Hydro’s proposed rate design criteria,
25 terms and conditions. In summary, both existing and prospective customers from a
26 diverse cross-section of industry have confirmed their support for the Incremental
27 Energy Rate Pilot.

3.4.1 Survey Responses from October and November 2018 Workshops

The survey responses to four specific questions regarding the Incremental Energy Rate Pilot from the October and November 2018 workshops are set out in the figures below. Taken collectively, BC Hydro considers this feedback to indicate support from a broad cross-section of customers and stakeholders for the rate design concept and structure, as well as the proposed pilot approach.

Figure 7 Incremental Energy Rate Survey Question 1 (October 2018)

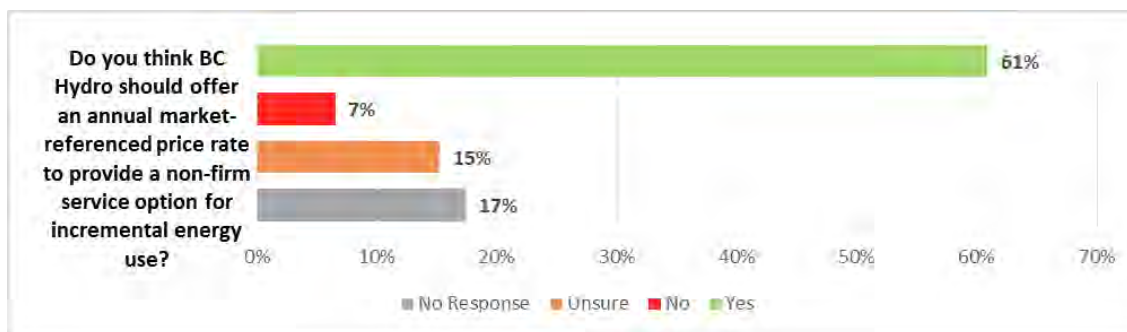
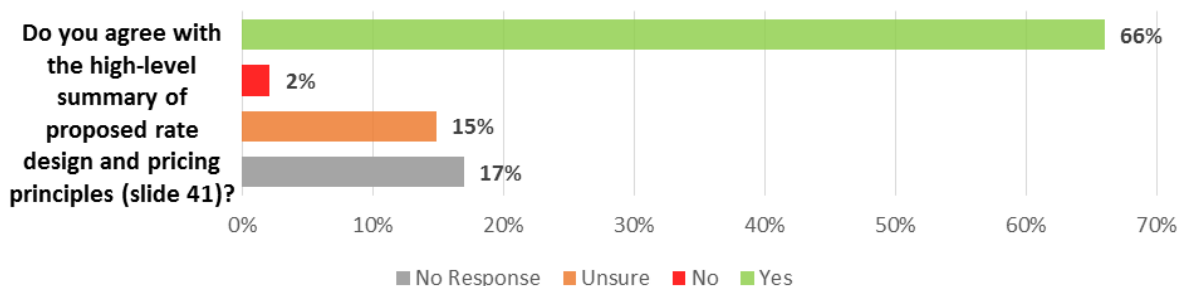
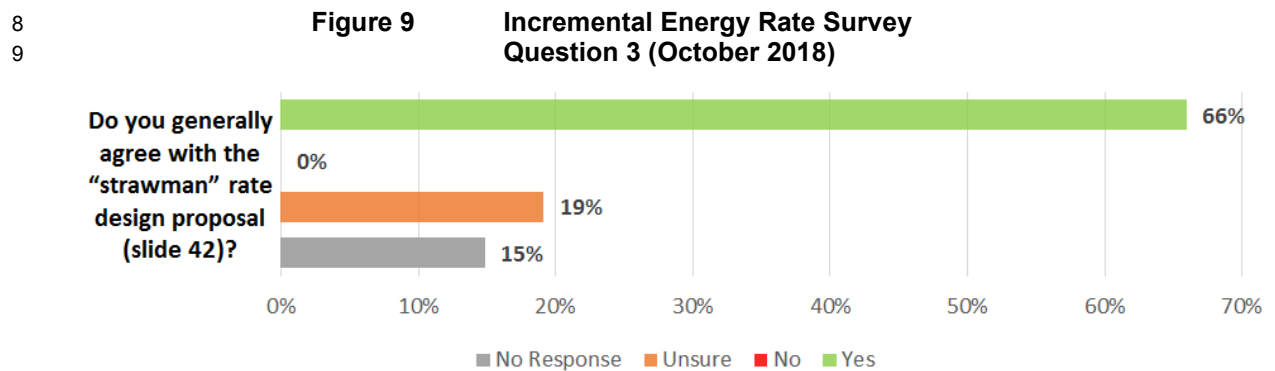


Figure 7 above shows the consolidated survey response from the October 2018 workshops regarding whether BC Hydro should offer an annual market reference-priced rate (i.e., the Incremental Energy Rate Pilot) to provide a non-firm service option for incremental energy use. Sixty one per cent of respondents agreed. Based on the information provided at that time, BC Hydro considers this response to demonstrate general support for offering a new annual non-firm service.

Figure 8 Incremental Energy Rate Survey Question 2 (October 2018)



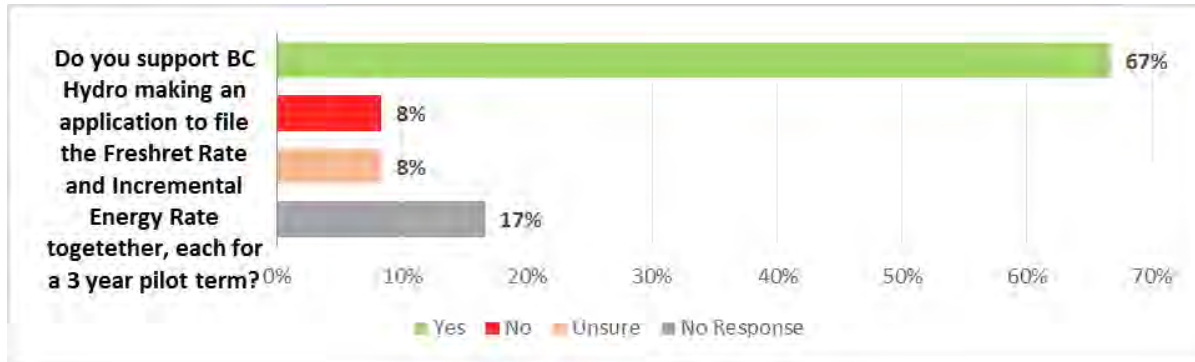
1 [Figure 8](#) above shows the consolidated survey response from the October 2018
2 workshops regarding whether participants agreed with the initial rate design concept
3 and pricing principles for the Incremental Energy Rate Pilot. Sixty-six per cent of
4 respondents agreed. BC Hydro considers this response to demonstrate general
5 support for the rate design concept and pricing principles originally proposed for the
6 Incremental Energy Rate Pilot and which have been incorporated into this
7 application.



10 [Figure 9](#) above shows the consolidated survey response from the October 2018
11 workshops regarding whether participants agreed with the original proposed
12 'strawman' rate design proposal for the Incremental Energy Rate Pilot.
13 Sixty-six per cent of respondents agreed. BC Hydro considers this response to
14 demonstrate general support for the proposed 'strawman' rate design, which is very
15 similar to the final rate design proposed in this application.

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Figure 10 Incremental Energy Rate Survey Question 4 (November 2018)



3 [Figure 10](#) above shows the consolidated survey response from the November 2018
4 workshop regarding whether participants agreed with BC Hydro’s proposed
5 approach to file a combined application for the Freshet Rate and Incremental Energy
6 Rate Pilot, each for a three-year pilot term. This was the proposed regulatory
7 approach at that time.²³ Sixty-seven per cent of respondents agreed. BC Hydro
8 considers this response to demonstrate general support for its proposal to introduce
9 the new Incremental Energy Rate Pilot on a pilot basis.

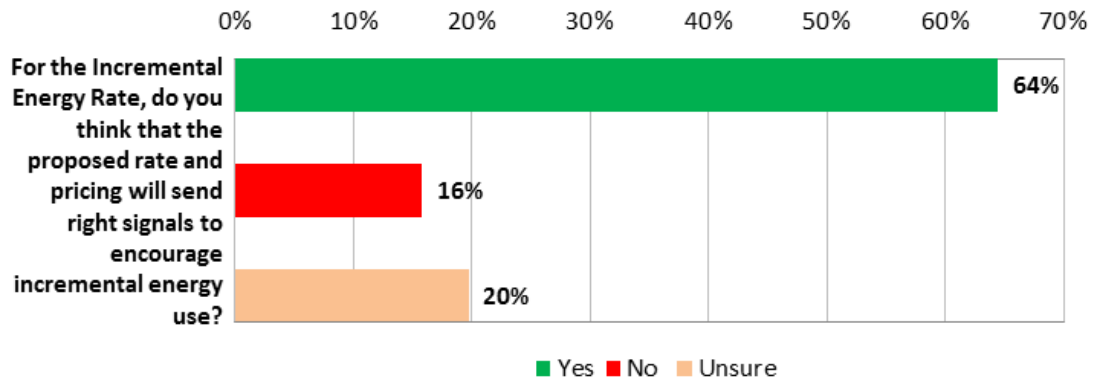
10 **3.4.2 Poll Responses from September 2019 Workshops**

11 The responses to seven polling questions regarding the Incremental Energy Rate
12 Pilot from the September 2019 workshops are set out in the figures below. Taken
13 collectively, BC Hydro considers this feedback to indicate support from a broad
14 cross-section of existing and new customers for the proposed rate design concept
15 and structure of RS 1893, as well as the proposed pilot approach. For each polling
16 question, where applicable, BC Hydro has described how customer feedback
17 received was considered and incorporated into the proposed final design.

²³ Based on the sum total of feedback received, BC Hydro subsequently elected to apply for the Freshet Rate to continue on an ongoing basis, rather than for a further three-year pilot period.

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Figure 11 Incremental Energy Rate - Polling Question 1 (September 2019)



3 [Figure 11](#) above shows the consolidated poll response (total of 76 respondents)
 4 from the September 2019 workshops regarding whether participants agree that the
 5 proposed Incremental Energy Rate Pilot design (i.e., annual non-firm, interruptible
 6 supply option) and pricing (i.e., day-ahead Mid-C pricing plus energy charge adder)
 7 would send the appropriate price signals to encourage incremental energy use.
 8 Sixty-four per cent of respondents agreed.

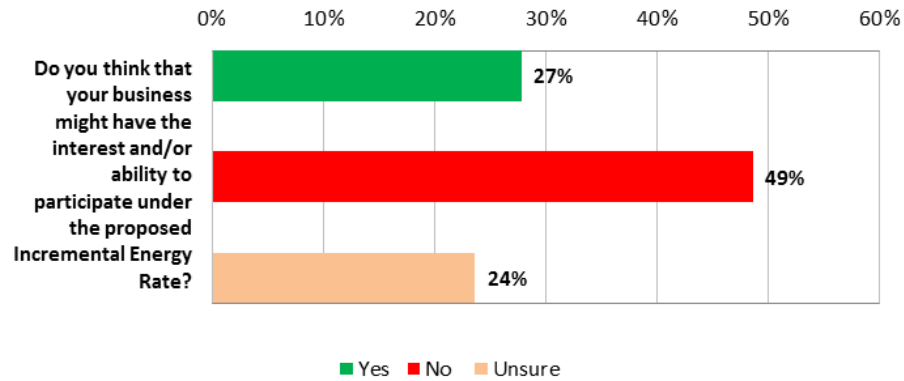
9 Whilst the initial poll response to this question demonstrates general support for
 10 BC Hydro’s proposed rate design, BC Hydro considers that support would now be
 11 significantly higher based on the changes made to broaden customer eligibility by
 12 removing the minimum size threshold as described below.

13 *Consideration of Feedback*

14 BC Hydro was able to confirm through verbal feedback provided by customers that
 15 many of the “no” and “unsure” responses shown in the figures that follow were in
 16 response to their prospective ineligibility to participate. For example, preliminary
 17 eligibility criteria for which BC Hydro sought feedback included a minimum 10 MVA
 18 size threshold. Customer feedback was that this threshold was too high and would
 19 exclude them from being able to participate. This was an unintended consequence,
 20 the impact of which is clearly shown in [Figure 12](#) below.

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Figure 12 Incremental Energy Rate - Polling Question 2 (September 2019)

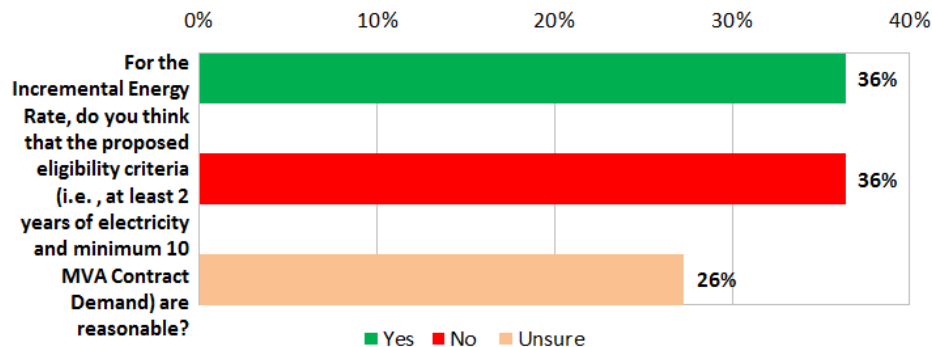


3 [Figure 12](#) above shows the consolidated poll response (total of 72 respondents)
 4 from the September 2019 workshops regarding whether participants might have the
 5 interest and/or ability to participate in the proposed Incremental Energy Rate Pilot.
 6 Only 27 per cent of respondents agreed. BC Hydro considers this response to
 7 demonstrate that the rate design, as originally proposed, would not provide all
 8 transmission service customers with an equal opportunity to participate.

9 BC Hydro acknowledges that the question was poorly worded, as it did not properly
 10 distinguish between “interest to participate” and “ability to participate”. However,
 11 BC Hydro was able to confirm that the majority of customers who responded “No”
 12 did so because of their inability to participate based on the prospective 10 MVA
 13 minimum size threshold, however, they did retain a strong interest to participate if
 14 they were eligible. Concern regarding BC Hydro’s originally proposed eligibility
 15 criteria is further highlighted in the response to the question shown in [Figure 13](#)
 16 below.

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Figure 13 Incremental Energy Rate - Polling Question 3 (September 2019)



3 [Figure 13](#) above shows the consolidated poll response (77 total respondents) from
4 the September 2019 workshops regarding whether participants agree with
5 BC Hydro’s proposed eligibility criteria for the Incremental Energy Rate Pilot.

6 Specifically, BC Hydro sought feedback on the reasonableness of having: (i) a
7 minimum of two years of electricity consumption history; and (ii) a minimum
8 Electricity Supply Agreement (**ESA**) Contract Demand of 10 MVA to be eligible to
9 participate. BC Hydro considers this response to demonstrate a lack of support for
10 its original proposed criteria. BC Hydro has addressed the concerns raised in its
11 consideration of eligibility criteria as described below.

12 *Consideration of Feedback*

13 BC Hydro’s primary rationale in proposing the minimum 10 MVA size criteria was to
14 mitigate the risk of unintended use of the rate. That is, BC Hydro was concerned that
15 prospective new customers might acquire (or choose to locate at) existing customer
16 brownfield sites with minimal historical consumption, such that the majority of new
17 load might be taken under the Incremental Energy Rate rather than under RS 1823.
18 Where any new load is not “truly incremental”, such that the load might reasonably
19 be considered to have occurred in the absence of the Incremental Energy Rate Pilot,
20 there would be a different electricity pricing and revenue outcome. To the extent that

1 a revenue reduction arises, relative to RS 1823, this could lead to an under-recovery
2 of BC Hydro's fixed costs and negative impacts for ratepayers.

3 In part, BC Hydro had initially proposed to mitigate this prospective risk through use
4 of both a minimum customer size threshold and a requirement for two years of
5 electricity consumption history. Customers did generally indicate their support for the
6 requirement for two years of consumption history, in recognition of the typical time
7 required for new plant start-up and commissioning to achieve normal operations.
8 However, both existing and prospective new customers provided clear feedback to
9 BC Hydro that they did not support the 10 MVA minimum size threshold.

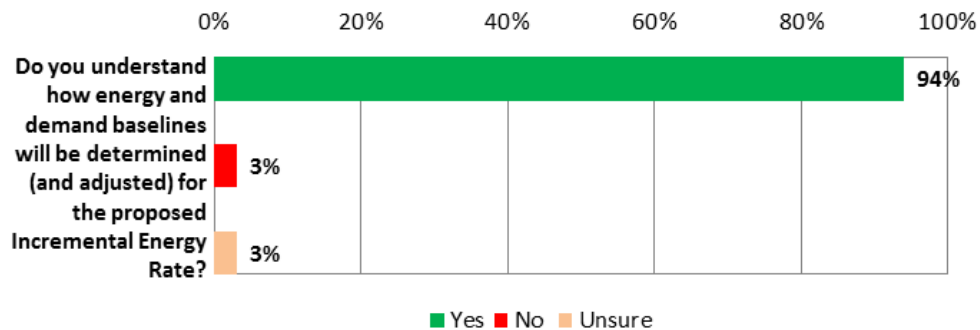
10 Specifically, a number of customers advised that such a threshold would exclude
11 them from being able to participate, which they considered to be unduly preferential
12 and/or discriminatory in favour of large customers. Further, BC Hydro's own analysis
13 has since determined that approximately 55 per cent of existing RS 1823
14 transmission service load customers would not meet the minimum 10 MVA threshold
15 and so would be ineligible.

16 BC Hydro has considered this feedback and analysis and believes it is prudent to
17 remove the proposed size criteria completely. Accordingly, BC Hydro's updated
18 proposal in this application is that no minimum size threshold will apply. All RS 1823
19 and RS 1828 transmission service customers with at least two years of consumption
20 history will be eligible to participate.

21 However, BC Hydro remains concerned about how best to mitigate risk related to
22 unintended use of the rate by RS 1823 customers. BC Hydro consulted with AMPC
23 on an alternative approach, which is to restrict the volume of incremental energy use
24 relative to an RS 1823 customer's approved baselines. BC Hydro's proposal, which
25 AMPC supports, is to limit the volume of incremental energy made available to the
26 customer under RS 1893 to a maximum level not to exceed two times their monthly
27 baselines. This proposal is described in more detail on page 68 of the application

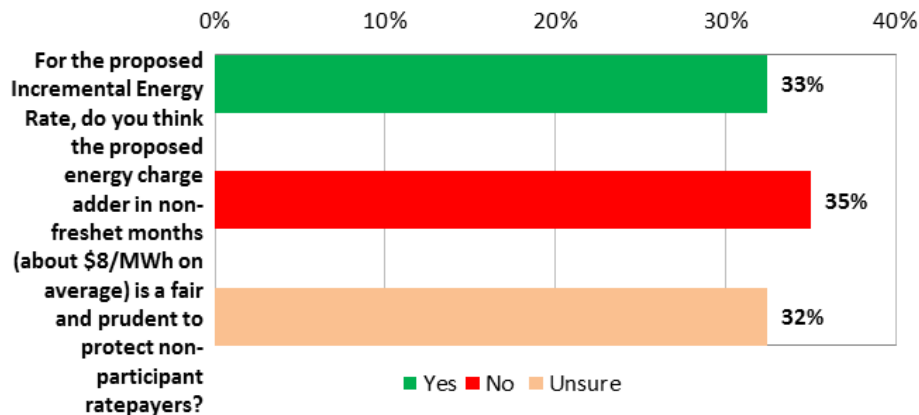
1 under the sub-heading “*Limitation of RS 1893 Usage for RS 1823 Customers*”. Refer
2 also to Special Condition 10 in Rate Schedule 1893.

3 **Figure 14 Incremental Energy Rate - Polling**
4 **Question 4 (September 2019)**



5 [Figure 14](#) above shows the consolidated poll response (total 67 respondents) from
6 the September 2019 workshops regarding BC Hydro’s proposed baseline
7 determination and adjustment criteria for the Incremental Energy Rate Pilot.
8 Ninety-four per cent of respondents confirmed their understanding. BC Hydro
9 considers this response to demonstrate strong support for its proposed baseline
10 determination and adjustment approach.

11 **Figure 15 Incremental Energy Rate - Polling**
12 **Question 5 (September 2019)**



1 [Figure 15](#) above shows the consolidated poll response (total 77 respondents) from
2 the September 2019 workshops regarding the perceived fairness of BC Hydro using
3 an energy charge adder of approximately \$8/MWh on average (in non-freshet
4 months) to protect non-participants. The purpose of the proposed adder is to ensure
5 that BC Hydro's marginal costs of providing service are adequately covered under
6 most expected conditions. This approach is consistent with the Bonbright principle of
7 protecting non-participant ratepayers from harm.

8 However, only 32 per cent of respondents agreed with BC Hydro's proposal.
9 BC Hydro considered this initial response to demonstrate a lack of support for its
10 proposed approach to prudently and efficiently protect non-participant ratepayers.
11 However, after further consultation with customers and AMPC, BC Hydro
12 determined that the principal fairness concern raised by customers is specific to the
13 allocation of risk between participants and non-participants (as reflected in the adder
14 price). This feedback is discussed in more detail below.

15 *Consideration of Feedback*

16 BC Hydro explained to customers that if it were required to import market energy
17 from Mid-C to serve a unit of incremental load, it would pay a wheeling fee for
18 delivery to the BC border presently equal to US\$5.16/MWh, plus a 1.9 per cent
19 energy loss adjustment for transmission.²⁴ At an average C\$/US\$ exchange rate of
20 0.75, this equates to a delivery charge from Mid-C to the B.C. border of
21 approximately C\$7/MWh.

22 BC Hydro further advised that the delivery charge for Mid-C market energy might
23 reasonably be increased by \$1/MWh, to an average of \$8/MWh, where the \$1/MWh

²⁴ The US\$5.16/MWh wheeling charge is calculated by adding the Non-Firm Point to Point hourly rate of US\$4.23/MWh (Schedule PTP-18) plus the Scheduling, System Control and Dispatch Service short-term hourly rate of US\$0.93/MWh. Please refer to Bonneville Power Authority Transmission Rates effective October 1, 2017. A summary of these rates can be found at the following link: <https://www.bpa.gov/Finance/RateInformation/RatesInfoTransmission/FY18-19/2018%20Rate%20Schedule%20Summary.pdf>.

1 adder would provide a small additional margin to cover BC Hydro's rate
2 administration and management costs and to balance other prospective risks such
3 as: (i) changes in foreign exchange rates; and (ii) differences between the
4 day-ahead Mid-C market energy prices used for Incremental Energy Rate Pilot
5 pricing and real-time prices for energy purchases at Mid-C and other energy markets
6 in which BC Hydro actively trades.

7 Although customers support the adder approach in principle, they are of the view
8 that it should be lower. Customer feedback included the following:

- 9 • BC Hydro is being too risk adverse;
- 10 • BC Hydro is being reactive to short-term low reservoir inflows;
- 11 • Participant customers are already taking the market price risk;
- 12 • The higher adder assumes the worst case scenario applies in every instance
13 (i.e., that BC Hydro will need to import market energy to serve every MWh of
14 incremental load); and
- 15 • A \$6/MWh adder would be more reasonable.

16 After further consultation with customers and AMPC, BC Hydro determined that
17 customers would prefer the energy charge adder in non-freshet months to be
18 \$6/MWh rather than \$8/MWh. This is consistent with BC Hydro's original rate design
19 proposal in October and November 2018, but differs from BC Hydro's revised rate
20 design proposal in September 2019.

21 **3.4.3 AMPC's Energy Charge Adder Proposal**

22 BC Hydro's financial modeling suggests that, in general, the \$2/MWh average
23 difference in energy adder during non-freshet months between what BC Hydro has
24 proposed (e.g., \$8/MWh) and what customers and AMPC are seeking
25 (e.g., \$6/MWh) is not very substantial. Based on preliminary modeling of annualized

1 financial impacts, the net revenue difference to BC Hydro is approximately
2 \$0.4 million per year.²⁵ In contrast, customers have stated that a higher energy
3 charge adder may have a material impact on their economic incentive to participate
4 in the proposed new rate. This may lead to lower participation rates and lower
5 incremental energy sales which, in turn, may reduce the benefits to participants and
6 non-participants.

7 BC Hydro considers that it has the dual objective of ensuring that any prospective
8 new rate is designed to optimize intended rate outcomes, which include:

- 9 (i) Encourage participant customers to consume incremental electricity; and
- 10 (ii) Ensure that non-participant customers are adequately protected.

11 During consultation following the September 2019 workshop, AMPC proposed that
12 BC Hydro simply “split the difference” and use an average energy charge adder of
13 \$7/MWh in non-freshet months. AMPC and its member customers stated that a
14 lower energy charge adder in non-freshet months would more fairly balance the
15 allocation of risk as between BC Hydro and participant customers and help to de-risk
16 customer participation to consume incremental electricity.

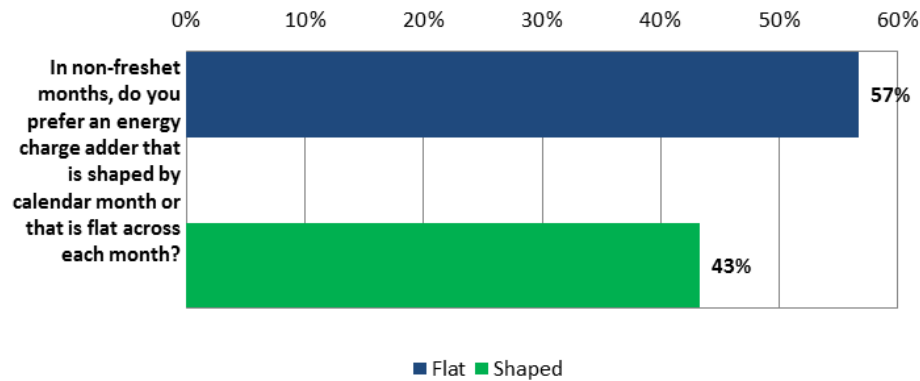
17 BC Hydro considers AMPC’s proposed approach to be fair, reasonable and
18 pragmatic in balancing the needs of both participant and non-participant customers.
19 BC Hydro’s view is that the proposed \$1/MWh reduction in the energy charge adder
20 during non-freshet months (i.e., from \$8/MWh to \$7/MWh), which results in an
21 estimated net revenue reduction to BC Hydro of \$0.2 million per year, is a
22 reasonable compromise. Accordingly, this alternative²⁶ (i.e., energy charge adder of
23 \$7/MWh in non-freshet months and \$3/MWh adder in freshet months) is BC Hydro’s
24 recommended approach in this application.

²⁵ Refer to section [5.5.3](#) of this application for details of BC Hydro’s financial analysis and model results.

²⁶ Also referred to as Option 2A in this application.

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Figure 16 Incremental Energy Rate - Polling Question 5 (September 2019)



3 [Figure 16](#) above shows the consolidated poll response (total 67 respondents) from
 4 the September 2019 workshops regarding use of a shaped or flat energy charge
 5 adder for non-freshet months. Fifty-seven per cent of respondents prefer a flat
 6 adder, while 43 per cent prefer an adder that is shaped by calendar month.
 7 BC Hydro considers this response to demonstrate a higher level of support for a flat
 8 energy charge adder. AMPC also advised its preference for a flat energy charge
 9 adder in non-freshet months.

10 *Consideration of Feedback*

11 Customer feedback in support of a preference for the flat adder for non-freshet
 12 months can be summarized as follows:

- 13 • Flat is perceived to offer more predictability in cost and budgeting/forecasting;
- 14 and
- 15 • Flat is simpler and easier to communicate and manage.

16 Customer feedback in support of a preference for a shaped adder in non-freshet
 17 months can be summarized as follows:

- 18 • Shaped reflects BC Hydro’s costs better and seems like the right thing to do;
- 19 and

-
- 1 • Shaped provides more opportunity (sharper price signal) for incremental energy
2 use in lower priced months.

3 BC Hydro seeks to balance the Bonbright principle for rate simplicity (via a flat
4 adder) with the Bonbright principle for economic efficiency (via a shaped adder that
5 sends a price signal which more closely reflects BC Hydro's cost and risk) and
6 feedback received. In general, based on the initial modeling of ratepayer impact,
7 BC Hydro is financially indifferent on an annualized basis as between the flat and
8 shaped adder pricing for each option.

9 Accordingly, BC Hydro's proposal in this application, consistent with feedback
10 received and AMPC's preference, is to apply a flat energy charge adder of \$7/MWh
11 in non-freshet months and a flat \$3/MWh energy charge adder in freshet months.

12 **3.5 Customer Feedback Themes**

13 A selection of written feedback²⁷ from transmission service customers is provided
14 below. BC Hydro considers this feedback to broadly indicate customer support for
15 the Incremental Energy Rate Pilot.

16 "The success of Freshet Rate and the nature of the market
17 lends itself to extending the program year round."

18 "This rate should be filed for Commission approval together with
19 the non-firm permanent Freshet Rate. It can be on a 3-year pilot
20 basis similar to the introduction of the Freshet Rate."

21 "This allows more rate options for customers ... while providing
22 additional mutual benefit to BC Hydro, the customer, and other
23 ratepayers."

24 "In principle, an annual market-reference rate for non-firm
25 incremental service offers support for low carbon electrification
26 on both the load side and the BC Hydro revenue side. We note

²⁷ For the full text of participant comments, please refer to the Engagement Summary Reports contained in Appendix F.

1 that 'incremental' means no shifting of load from the regular
2 tariff."

3 "The proposed annual market-referenced price rate encourages
4 greater consumption of electricity beyond the Freshet Rate ...
5 it's beneficial to customers, BC Hydro and all other ratepayers."

6 "Customers should only be able to elect services on either
7 Freshet or Market-referenced price rate (i.e., not both). When
8 filed together with the permanent Freshet Rate, BC Hydro can
9 gain sales on latent loads that otherwise would not have been
10 consumed under the Tier 2 energy rate. Customers who are on
11 either of the rates are exposed to price risks but can better
12 manage their energy costs on the incremental usages."

13 "This rate may encourage customers to increase their
14 productivity when they might otherwise have not. Also, the
15 Freshet Pilot has shown that the market has opportunities
16 throughout the year, outside of the traditional Freshet period.
17 Moreover, many industries have seasonal fluctuations in
18 markets and supply pricing which may create incentives to
19 consume more energy outside of Freshet."

20 **3.6 Intervener Feedback Themes**

21 A selection of feedback from interveners that attended the October and
22 November 2018 workshops is described below. In general, BC Hydro considers this
23 feedback to reflect conditional intervener support - or indifference - for the
24 Incremental Energy Rate Pilot.

- 25 • AMPC stated that: "The success of the freshet (rate) and the nature of the
26 market lends itself to extending the program year around. The freshet rate has
27 demonstrated the win-win-win nature of the proposal. Setting and
28 communicating the reference price clearly will be important, as well as being
29 nimble in responding to unanticipated outcomes, analogous to the combination
30 of July peaks and seasonal reconciliation in the Freshet Rate Pilot. Interaction
31 with Rate Schedule 1823 will need to be carefully considered."

-
- 1 • In contrast, one intervener that does not represent transmission service
2 customers provided feedback that "... the whole discussion of base-line
3 adjustments seemed very complex and bureaucratic (and subject to abuse)".
4 The same intervener, in making a comparison with the Freshet Rate, also
5 indicated that "... the incremental rate with monthly settlements is better ... at
6 least for customers sophisticated enough to manage their energy requirements
7 in response to daily changes in market conditions."
- 8 • Other intervener feedback speaks to the potential lack of opportunity to
9 participate where "members cannot leverage the benefits of the proposed
10 Incremental Energy Rate" or reluctance to comment "without the assistance of
11 our expert consultant" and in the absence of having a filed application for
12 review. Separately, while CAPP indicated that it "has no position" on the rate, it
13 did comment that the proposed Incremental Energy Rate Pilot "would help
14 economic development and would not risk established customers."
- 15 • Finally, intervener feedback flagged concerns related to eligibility and
16 conditions of access. Feedback was provided that the "rate should be available
17 to all loads (not just existing)" and BC Hydro should adopt strict opt-out and
18 cancellation provisions to protect BC Hydro ratepayers from imposing "long-run
19 obligations and costs on everyone else".

20 **4 BC Hydro's Freshet Rate Proposal**

21 **4.1 Introduction**

22 The Freshet Rate is designed to make incremental energy available at an efficient
23 price to RS 1823 and RS 1828 customers during the freshet period of May through
24 July when BC Hydro generally has a seasonally-recurring energy surplus. In its Final
25 Evaluation Report, BC Hydro stated that the pilot was successful and made
26 three recommendations: (1) BC Hydro should continue to offer the Freshet Rate;
27 (2) the existing Freshet Rate design is effective; and (3) the Freshet Rate design

1 concept should be expanded to the entire year. As described in the Final Evaluation
2 Report, the Freshet Rate produced benefits for participants and non-participants.
3 These benefits are expected to continue.

4 BC Hydro has identified that Year 4 of the Freshet Rate pilot represented a
5 substantial change in conditions compared to Years 1 to 3. As described in the
6 2019 Evaluation Report for Year 4 contained in **Appendix E**, conditions during the
7 May to July 2019 freshet period were characterized by a electricity supply issue as a
8 result of the Enbridge gas pipeline issue and low reservoir inflows. This reduced the
9 freshet energy surplus and contributed to higher system marginal prices and higher
10 market energy imports. These conditions resulted in a revenue loss of \$0.5 million
11 for 2019. This compares to revenue gains of \$2.3 million in 2016, \$2.2 million in
12 2017 and \$1.9 million in 2018.

13 Even with these conditions, the revenue loss in Year 4 was modest relative to
14 revenue gains in prior years. Over the entire four-year period of the pilot, the total
15 revenue gain was positive at \$5.8 million. Based on these results, BC Hydro
16 considers that the rate design includes a number of elements that minimize risk to
17 BC Hydro ratepayers and participating customers. Although there is a risk of loss to
18 ratepayers in any given year if adverse conditions arise, the rate design is expected
19 to provide net benefits to ratepayers over a multiyear time period. These elements
20 include:

- 21 (a) Freshet Rate energy pricing is based on the Mid-C market price, which is
22 expected to be generally reflective of BC Hydro's marginal cost of energy. As a
23 result, load served under the Freshet Rate is expected to continue to recover its
24 marginal cost of energy;
- 25 (b) While energy pricing under the Freshet Rate is based on Mid-C market prices, it
26 also includes a price floor of \$0/MWh and an adder of \$3/MWh. The floor and
27 adder are expected to help ensure that customers taking incremental service

-
- 1 under the Freshet Rate make some contribution to BC Hydro's fixed costs even
2 in periods of very low or negative market pricing;
- 3 (c) The Freshet Rate is non-firm and interruptible. BC Hydro will provide energy
4 and capacity under this rate schedule only to the extent it is available. No
5 estimates of load under the Freshet Rate have been included in BC Hydro's
6 load forecast and BC Hydro is not required to undertake system reinforcements
7 to serve load under this rate schedule. BC Hydro also has operating procedures
8 in place to interrupt non-firm Freshet Rate service customer loads to mitigate
9 the impact of actual or prospective system constraints and prioritize service to
10 firm service customer loads;
- 11 (d) BC Hydro offered the Freshet Rate as a pilot for four years and completed
12 four evaluations in that period. BC Hydro has confirmed in its Final Evaluation
13 Report that the risks identified at the time the Freshet Rate was applied for in
14 the 2015 RDA, such as load shifting from RS 1823 to RS 1892, were not
15 substantial enough to offset ratepayer benefits; and
- 16 (e) The Freshet Rate is optional. Should Mid-C energy prices increase such that it
17 would be uneconomic for customers to take service under the Freshet Rate,
18 they may choose to not participate. Such customers would still have firm
19 service available to them at stable prices under RS 1823 or RS 1828 within the
20 limit of the Customer's Contract Demand under their Electricity Supply
21 Agreement.

22 **4.1.1 Impact of Variability of Water Flows**

23 BC Hydro notes that there can be significant variability in system water inflows, in
24 the range of +/- 7,000 GWh/yr. During high inflow years the freshet period energy
25 surplus will be higher and during low inflow years, the freshet period energy surplus
26 will be lower. Even during a low inflow year, minimum generation from BC Hydro
27 non-flexible resources combined with must-take generation from Independent Power

1 Producers can still result in total generation exceeding load and storage capability in
2 any given hour. This is because BC Hydro's reservoirs remain limited in their ability
3 to capture all must-take energy on an hour-by-hour and daily basis due to real time
4 operating constraints and minimum generation required.

5 In a low inflow year, there is an increased risk that market energy imports might be
6 used to serve incremental energy under the Freshet Rate in any given hour. This is
7 described as "Condition 2: Minimum Generation with Imports" in the Final Evaluation
8 Report²⁸ and 2019 evaluation report for Year 4. Where BC Hydro is importing market
9 energy in any given hour to serve Freshet Rate loads, there is an increased risk that
10 BC Hydro will not recover its marginal cost of energy in that hour. Holding market
11 price constant, BC Hydro will see a revenue decrease equal to the difference
12 between the C \$3/MWh adder collected under RS 1892 and the US\$5.16/MWh
13 wheeling charge paid for energy delivery from the Mid-C market to the BC border
14 (converted to Canadian dollars daily) plus 1.9 per cent transmission losses. On days
15 where the market price is negative, the daily revenue loss is reduced by the
16 difference between the actual market price and \$0/MWh floor price under RS 1892.

17 The revenue impact can also vary if BC Hydro uses lower cost market energy to
18 serve incremental Freshet Rate load in real time rather than storing that energy in
19 large reservoirs for later use. Where BC Hydro has to purchase replacement energy
20 from market to serve load at some future point, the impact will be: (i) a revenue loss
21 if the future market energy incremental import is priced higher than the freshet
22 market energy import; or (ii) a revenue gain if the future market incremental energy
23 import is priced lower than the freshet market energy import.

24 In general, BC Hydro considers that the \$3 per MWh adder provides a sufficient
25 margin to cover any residual revenue shortfalls that may arise for energy imports
26 over the entire freshet period and across multiple freshet periods. That is, although

²⁸ Refer to page 17 of the Freshet Rate Pilot Final Evaluation Report.

1 the \$3 per MWh adder does not recover the full cost of wheeling for delivery of
2 market energy to the BC border, it does serve to reduce the risk associated with any
3 prospective revenue shortfall that might arise when higher cost replacement energy
4 imports have not been fully offset by lower cost replacement energy imports.

5 **4.2 Explanation of Proposed Amendments**

6 Consistent with the recommendations above, BC Hydro seeks BCUC approval for
7 an ongoing Freshet Rate with the minor amendments described below. All of the
8 amendments proposed by BC Hydro are shown in the blacklined version of RS 1892
9 in **Appendix B** and fall into two categories: (1) house-keeping amendments; and
10 (2) new terms and conditions. “House-keeping updates” include removal of expired
11 or transitional provisions and minor wording changes to improve clarity and
12 customer understanding. “New terms and conditions” reflect items identified by
13 BC Hydro and customers that were reviewed and considered through the
14 consultation process. BC Hydro is not proposing any changes to the Freshet Rate
15 design, pricing or structure.

16 **4.3 Rate Design Elements**

17 In the descriptions below, BC Hydro has summarized each key element of the
18 proposed Freshet Rate, and identified any proposed amendments. The proposed
19 clean and black-lined versions of RS 1892 are provided in **Appendix B**.

20 Capitalized terms in this section have the meanings given to them in BC Hydro’s
21 Electric Tariff or the proposed RS 1892, unless otherwise defined.

22 *Availability*

23 The rate is open to RS 1823 Customers during the Freshet Period of May 1 to
24 July 31. BC Hydro has also extended the Availability condition to include Biomass
25 Energy Program customers taking service under RS 1828. RS 1828 customers have
26 the same terms and conditions of service as RS 1823 customers, other than the

1 different pricing in place to address the structure of the Biomass Energy Program
2 contracts.²⁹

3 *Energy Charge*

4 *No change proposed.* The Mid-C market price continues to be appropriate for
5 Freshet Rate energy pricing. In addition to BC Hydro expecting Mid-C prices to be
6 generally reflective of its short-run marginal cost of energy, the Intercontinental
7 Exchange (**ICE**) Day Ahead Power Price Report is available via subscription and is
8 transparent and independently verifiable by Customers. The ICE Index is published
9 by an independent third-party. BC Hydro proposes that Net Freshet Energy will
10 continue to be priced using the ICE Mid-C Peak and Off Peak weighted average
11 index prices, applicable to the hour. A price floor of \$0/MWh will continue to apply.

12 *Demand Charge*

13 *No change proposed.* As the Freshet Rate is non-firm and interruptible, BC Hydro
14 proposes that there continue to be no demand charge for load taken above the
15 Reference Demand during High Load Hours (**HLH**) of the Billing Period. The Billing
16 Demand determination under RS 1823 or RS 1828, as applicable, incorporates the
17 lesser of Reference Demand and the actual highest kVA demand during HLH in the
18 Billing Period.

19 *Wheeling rate / Adder*

20 *House-keeping change proposed.* BC Hydro proposes to replace the term ‘wheeling
21 rate’ with ‘adder’ for clarity and to avoid confusion. As there is no direct physical
22 transaction for procurement or delivery of market energy under RS 1892, the term
23 ‘wheeling rate’ is not accurate. The ‘adder’ is priced to provide a contribution to

²⁹ As discussed in section [1.1.4](#) of this Application, BC Hydro recently sought approval to extend the availability of RS 1880 to include RS 1828 customers, which was granted approval by Commission Order No. G-236-19. In this Application, BC Hydro is seeking similar approval to extend the availability of RS 1892 to customers taking service under RS 1828. This is on the basis that the terms and conditions for RS 1823 and RS 1828 are similar and RS 1828 customers should have access to the same non-firm service options as RS 1823 customers.

1 BC Hydro's fixed costs, including a margin for risk, based on average system
2 conditions during the freshet period. There is no change proposed to the value of the
3 \$3.00/MWh adder on net RS 1892 energy volumes.

4 *Definitions*

5 *House-keeping change proposed.* For defined terms used in RS 1892, BC Hydro
6 has incorporated a reference to Tariff Supplement (TS) 87 for the provision of
7 Indirect Interconnection Service.

8 *Eligibility and Notice*

9 *No change proposed.* Under Special Condition 3, both RS 1823 and RS 1828
10 Customers will continue to notify BC Hydro by March 1 of each year that they wish to
11 take electricity under RS 1892 for the forthcoming Freshet Period. The Customer
12 notice must include an estimate of the amount of incremental energy that the
13 Customer expects to take under the rate schedule and a description of their planned
14 actions to increase load.

15 *Non-firm Service*

16 *No change proposed.* Under Special Condition 1, RS 1892 service is non-firm and
17 interruptible. BC Hydro will only provide service where it has energy and capacity to
18 do so. BC Hydro has the right to interrupt RS 1892 service for transmission and
19 generation system constraints. RS 1892 load is not included in BC Hydro's load
20 forecast. BC Hydro will not advance any system investments to serve load.

21 *Freshet Period Determination*

22 *No change proposed.* Under RS 1892, the Freshet Period is defined as May 1 to
23 July 31, inclusive. BC Hydro received Customer feedback regarding: (i) an
24 expansion of the freshet period to include April; or (ii) a change to the period to

1 replace the month of July with April.³⁰ BC Hydro has carefully considered the
2 feedback provided. In both cases, the majority of feedback was premised on April
3 typically having low Mid-C market energy prices. There was also a desire to align the
4 freshet period with a standard quarterly period for financial reporting.

5 As described in the Final Evaluation Report, BC Hydro considers that the existing
6 Freshet Period: (a) remains generally consistent with the seasonal timing of water
7 inflows to BC Hydro's large basins and must-take generation from Independent
8 Power Producers; and (b) continues to be the period of highest system minimum
9 generation in the BC Hydro system. Accordingly, no change to the freshet period is
10 proposed. However, BC Hydro has incorporated this customer feedback into the
11 design of the Incremental Energy Rate Pilot.

12 *HLH and Low Load Hours (LLH)*

13 *House-keeping changes proposed.* BC Hydro proposes to align the HLH and LLH
14 definitions with RS 1823 and RS 1828. This is to manage the billing system overlay
15 of firm electricity service under RS 1823 or RS 1828 with non-firm electricity service
16 under RS 1892. The practical impact of this change is to avoid participant Customer
17 confusion about the treatment of North American Electricity Reliability Corporation
18 (**NERC**) Statutory Holidays (Memorial Day and Independence Day) under RS 1892,
19 which are different from B.C. Statutory Holidays (Victoria Day and Canada Day)
20 under RS 1823. This Customer confusion was described in the Final Evaluation
21 Report.³¹ The change confirms that BC Hydro will use a consistent definition of HLH
22 and LLH to which published Mid-C On-peak and Off-peak reference prices will apply.

23 *RS 1892 Baseline Determination for Existing Customers*

24 *No change proposed.* The default period for determining HLH and LLH Baselines
25 and Reference Demand will continue to be based on RS 1823 Electricity usage from

³⁰ The proposed Incremental Energy Rate Pilot will provide customers with the opportunity to increase load in all months of the year, including April.

³¹ Refer to page 51 of section 3.4.7 in BC Hydro's Freshet Rate Final Evaluation Report.

1 the 2015 Freshet Period unless an alternate period is approved by the BCUC. This
2 results in seasonal average baselines for energy and demand.

3 *RS 1892 Baseline Determination for New Customers*

4 *New terms and conditions proposed.* Refer to Special Condition 3. BC Hydro has
5 proposed that new Customers will require at least one year of historical RS 1823 or
6 RS 1828 Electricity usage during the Freshet Period. BC Hydro has also proposed
7 that, where Customers do not have RS 1823 Electricity usage in the default 2015
8 Freshet Period, electricity usage during the most recent Freshet Period will be used.

9 *Change in Site Ownership*

10 *New terms and conditions proposed.* Refer to Special Condition 8. BC Hydro has
11 proposed that RS 1892 baselines which have been determined for a Customer
12 taking service under RS 1823 be maintained for the site even if there is a change in
13 ownership without need for adjustment or BCUC approval.³² If the new site owner
14 expects to operate the site differently, such that the existing site baselines are no
15 longer representative of normal Electricity use during the Freshet Period, new
16 RS 1892 baselines will be determined as approved by the BCUC. BC Hydro has
17 also proposed that a change in site ownership which occurs during any current
18 Freshet Period will result in automatic cancellation. This is because RS 1892 energy
19 is determined on a seasonal basis and there is no mechanism to fairly allocate the
20 RS 1892 baselines and energy performance as between the prior and new site
21 owner.

22 *BCUC Approval of RS 1892 Baselines*

23 *House-keeping changes proposed.* Under Special Condition 3, BC Hydro has stated
24 that where customers do not have 2015 Freshet Period Electricity, the most recent
25 Freshet Period will be used for RS 1892 baseline determination. Customers must

³² This approach is consistent with the assignment of the Energy CBL under TS 74.

1 also have at least 12 months of historical RS 1823 electricity usage. The principle is
2 to ensure that RS 1892 baselines are adequately representative of the Customer's
3 expected normal RS 1823 or RS 1828 electricity usage during the freshet period in
4 the absence of RS 1892. Similarly, BC Hydro seeks to ensure that customers who
5 have transitioned to service under RS 1828 can apply for adjustments to their
6 historical baselines to reflect the expected change in electricity purchases from
7 BC Hydro that may arise pursuant to their participation in the Biomass Energy
8 Program.

9 Further, under Special Conditions 4 and 5, BC Hydro seeks to clarify that: (a) it
10 would only file an application to the BCUC if alternative or adjusted RS 1892
11 baselines were determined in consultation with the Customer; and (b) any
12 adjustments will be considered consistent with the principles and criteria set out in
13 Tariff Supplement 74 (**TS 74**) - Customer Baseline Load Determination Guidelines.
14 This amendment reflects BC Hydro's practice over the four years of the Freshet
15 Rate Pilot and is intended to provide transparency and certainty to Customers as to
16 the approach.

17 *Billing / Settlement*

18 *No changes proposed.* The following are the proposed RS 1892 energy billing steps:

- 19 • HLH and LLH baselines are calculated as the average hourly energy purchases
20 under RS 1823 or RS 1828 in the HLH and LLH hours, respectively, of the
21 baseline freshet period;
- 22 • HLH and LLH Gross Freshet Energy is calculated hourly in excess of the
23 applicable HLH and LLH baselines and summed for the entire Freshet Period
24 season;

-
- 1 • HLH and LLH Net Freshet Energy is determined seasonally and is equal to,
2 respectively, the total metered energy in HLH and LLH that is greater than the
3 total baseline energy in HLH and LLH;
- 4 • A seasonal Net to Gross Energy ratio is calculated for each of HLH and LLH.
5 The ratio is equal to HLH (or LLH) Net Freshet Energy divided by HLH (or LLH)
6 Gross Freshet Energy, and is expressed as a percentage. The ratio is equal to
7 100 per cent if HLH (or LLH) Gross Freshet Energy equals or exceeds HLH (or
8 LLH) baseline energy in each hour of the period; otherwise, the ratio is less
9 than 100 per cent;
- 10 • The resultant HLH (or LLH) ratio is applied to Gross Freshet Energy in HLH (or
11 LLH) on each day to determine the daily volume of RS 1892 HLH (or LLH)
12 energy;³³ and
- 13 • The daily RS 1892 HLH (or LLH) energy volume is then multiplied by the daily
14 Mid-C Peak (or Off-Peak) ICE Index energy price. Daily Mid-C energy prices
15 are converted from US\$ to C\$ using the daily Bank of Canada exchange rate.
16 An energy charge adder of \$3 per MWh is applied to all RS 1892 energy
17 volumes.

18 RS 1892 energy billing is performed on a retroactive basis in August (i.e., at the
19 conclusion of the Freshet Period). BC Hydro has received Customer feedback that
20 monthly settlement and billing is a preferred alternative³⁴ to the current seasonal
21 settlement and billing methodology described above. However, as noted in the Final
22 Evaluation Report, BC Hydro considers that seasonal billing reduces administrative

³³ The application of the HLH and LLH ratio is required to ensure that RS 1892 pricing applies only to total energy purchases above baseline on a seasonal basis. If the ratio were not applied, then the approach of setting Gross Freshet Energy to zero for hours where purchases were below baseline could result in RS 1892 pricing being applied to energy that might otherwise have been charged under RS 1823 or RS 1828.

³⁴ BC Hydro has incorporated monthly settlement and billing into its proposal for the Incremental Energy Rate. This approach considers monthly load variation over the entire year for baseline establishment and determination of incremental energy use. As an annual rate option, it also harmonizes with the annual baseline review and adjustment processes for the RS 1823 Stepped Rate under TS 74.

1 burden and baseline complexity for the Freshet Rate. It also reduces the potential for
2 load shifting between Freshet Period months with no net increase in electricity use.

3 *Cancellation Provisions*

4 *No changes proposed.* Under Special Condition 8, a participating Customer may
5 elect to cancel supply under RS 1892 at any time during the Freshet Period prior to
6 July 31. Under Special Condition 10, a validated request for RS 1880 service will
7 result in automatic cancellation of supply under RS 1892. If supply under RS 1892 is
8 cancelled, all Electricity supplied during the current Freshet Period will be billed
9 under RS 1823 or RS 1828 and/or RS 1880, as applicable.

10 *Treatment of Customers with an Electricity Purchase Agreement (EPA)*

11 *House-keeping changes proposed.* Under Special Condition 7, BC Hydro has
12 amended the language to more clearly identify the circumstance which would
13 warrant cancellation of RS 1892 service. A Customer with an EPA is not eligible to
14 receive a financial payment from BC Hydro for turndown generation during the
15 Freshet Period and simultaneously benefit from lower market reference-priced
16 energy for any associated increase in electricity purchases from BC Hydro. No
17 instances of this actually occurring have been identified, but BC Hydro believes the
18 change is appropriate to improve clarity and understanding.

19 **4.4 Freshet Rate Bonbright Assessment**

20 [Table 5](#) shows BC Hydro's Bonbright assessment of the Freshet Rate.

1

Table 5 Freshet Rate Bonbright Assessment

Bonbright Criteria	2015 RDA Grouping	Performance	Remarks
1. Price signals to encourage efficient use and discourage inefficient use	Economic Efficiency	Good	The energy charge sends an efficient price signal to the Freshet Rate customers as it is based on the ICE Mid-Columbia market price index, which is expected to generally reflect BC Hydro's marginal cost of energy.
2. Fair apportionment of costs among customers	Fairness	Good	The Freshet Rate is expected to recover the marginal cost of energy used to serve freshet customers and make some contribution to fixed costs.
3. Avoid undue discrimination	Fairness	Good	The Freshet Rate is available to all RS 1823 and RS 1828 customers.
4. Customer understanding and acceptance; practical and cost effective to implement	Practicality	Fair/Good	Customers understand the Freshet Rate and are in favour of its approval. The Freshet Rate includes a baseline and seasonal reconciliation for billing, and daily market pricing information, which is more complex to administer than a more traditional rate design.
5. Freedom from controversies as to proper interpretation	Practicality	Fair/Good	Same as Bonbright criterion 4 above.
6. Recovery of the revenue requirement	Stability	Good	For incremental load, it is expected to recover the marginal cost of energy and make some contribution to fixed costs. For RS 1823 and RS 1828 baseline load, there is stable recovery of the revenue requirement.

Bonbright Criteria	2015 RDA Grouping	Performance	Remarks
7. Revenue stability	Stability	Fair/Good	The Freshet Rate has provided relatively stable revenues to date. Revenue changes closely match cost changes that arise from changes in customer load because RS 1892 pricing generally reflects marginal cost.
8. Rate stability	Stability	Good	The Freshet Rate is based on a market price index, which can be volatile; however, customers choosing to participate will be aware of the potential for volatility in advance and can adjust energy use to reflect their unique economics. Customers can choose to reduce consumption of freshet energy when market prices are high and continue to receive firm service with stable and predictable pricing under RS 1823 or RS 1828 for baseline load.

1 **5 BC Hydro's Incremental Energy Rate Pilot Proposal**

2 **5.1 Introduction**

3 The Incremental Energy Rate Pilot is a proposed new optional rate for non-firm,
4 interruptible electricity service that would be made available to RS 1823 or RS 1828
5 transmission service customers for an expected 51-month³⁵ pilot period ending
6 March 31, 2024. Subscribers to this new rate would have year round access to
7 Mid-C market-reference priced energy for incremental electricity relative to
8 pre-determined monthly baselines for energy and demand. The baselines would be
9 determined on a customer account-specific basis using historical annual energy
10 consumption under RS 1823 or RS 1828. The rate is designed to make incremental
11 market-reference priced energy, plus an appropriate adder, available to RS 1823
12 and RS 1828 customers during any Billing Period of the year.

13 **5.2 Rationale for New Optional Rate**

14 In its Final Evaluation Report, BC Hydro recommended that the Freshet Rate design
15 concept be expanded to the entire year. This recommendation stemmed from
16 customer feedback, as well as the demonstrated participant and non-participant
17 ratepayer benefits that resulted from the Freshet Rate pilot. BC Hydro considers that
18 the Incremental Energy Rate Pilot should be offered to transmission service
19 customers on a pilot basis for three key reasons:

- 20 1. The proposed Incremental Energy Rate Pilot is responsive to customer
21 feedback. Transmission service customers have requested flexible rate options
22 that better match their individual operating capabilities and electricity service
23 requirements. Customers have identified the annual availability of non-firm
24 service with market-referenced pricing and monthly settlement as a key
25 objective during the consultation process. The Incremental Energy Rate Pilot is

³⁵ The term of the pilot period might vary based on the actual approved commencement date by the BCUC and/or prospective alignment with either a BC Hydro fiscal year or calendar year, including any transition period.

-
- 1 also responsive to the 2013 Industrial Electricity Policy Review (IEPR) taskforce
2 recommendations to develop innovative rate options for industrial customers;
- 3 2. BC Hydro has experience with the use of market-referenced energy pricing to
4 facilitate the use of incremental electricity, when available, and the
5 determination and adjustment of electricity baselines to separate firm and
6 non-firm service. BC Hydro has demonstrated that such market
7 reference-priced rate designs are well understood and accepted by customers
8 and can provide benefits to both participants and non-participants; and
- 9 3. BC Hydro expects that daily ICE Index Mid-C pricing , plus an appropriate
10 adder, will generally reflect BC Hydro's short-run marginal cost of energy and
11 therefore be economically efficient. When market energy prices are low,
12 customers will have the opportunity to respond by increasing electricity usage.
13 When market energy prices are high, customers can respond by reducing
14 electricity usage to baseline levels.

15 BC Hydro recognizes that market and BC Hydro operating conditions may vary
16 substantially from month to month and from year to year. BC Hydro assessed
17 ratepayer impacts under a range of scenarios³⁶ and expects them to be positive over
18 the pilot period as discussed in section [5.5](#) of this application, which sets out
19 BC Hydro's economic justification for the Incremental Energy Rate Pilot.

20 The Incremental Energy Rate Pilot includes the following elements to manage risk to
21 participating customers and to non-participating ratepayers:

- 22 • The Incremental Energy Rate Pilot would be offered as a pilot effective
23 January 1, 2020 and ending March 31, 2024 with annual monitoring and an
24 evaluation report in the fall of 2023. This fixed term of the rate limits the risk to
25 BC Hydro if it does not perform as expected. In addition, the evaluation

³⁶ The economic analysis considers 46 unique years of historical weather sequences, water inflows and market prices.

1 provides an opportunity for BC Hydro to analyze and consult on the rate design,
2 after which BC Hydro may propose that the rate be amended;

- 3 • The Incremental Energy Rate Pilot energy pricing is referenced to daily ICE
4 Index Mid-C market pricing BC Hydro expects this price, with appropriate
5 adjustments to account for seasonal storage and wheeling, to generally reflect
6 BC Hydro's short-run marginal cost of energy under most expected conditions.
7 As a result, load served under the Incremental Energy Rate Pilot is expected to
8 recover BC Hydro's marginal cost of energy;³⁷
- 9 • While energy pricing under the Incremental Energy Rate Pilot is referenced to
10 Mid-C market prices, it also includes a price floor of \$0/MWh and an energy
11 charge adder of \$3.00/MWh in freshet months and \$7.00/MWh in non-freshet
12 months on net energy sales. The price floor and adder are expected to ensure
13 that customers taking service under the Incremental Energy Rate Pilot not only
14 cover BC Hydro's marginal cost of energy, but also make some contribution to
15 BC Hydro's fixed costs and margin under a wide range of market prices,
16 reservoir inflows and weather conditions;
- 17 • The Incremental Energy Rate Pilot is non-firm and interruptible. BC Hydro will
18 provide energy and capacity under this rate schedule only to the extent it is
19 available. BC Hydro is not required to undertake system reinforcements to
20 serve load under this rate schedule. RS 1893 load is not included in BC Hydro's
21 load forecast. BC Hydro has the right to interrupt RS 1893 service for
22 transmission and generation system constraints; and
- 23 • The Incremental Energy Rate Pilot is optional. Should Mid-C energy prices
24 increase such that it would be uneconomic for customers to take service under
25 the Incremental Energy Rate Pilot, they may choose to not participate. Such

³⁷ Mid-C energy pricing, with appropriate adjustments to account for seasonal storage and wheeling, is generally considered to be a reasonable proxy for the short run marginal price of energy: (i) based on the small volumes of energy expected to be associated with the rate; and (ii) with the exception of periods when BC Hydro system storage conditions don't align with similar conditions in the Pacific Northwest.

1 customers would still have firm service available to them at stable prices under
2 RS 1823 or RS 1828 within the limits of the Contract Demand in their Electricity
3 Supply Agreement.

4 **5.3 Implementation Considerations**

5 BC Hydro proposes to implement RS 1893 on a 51-month pilot basis beginning
6 January 1, 2020 and ending March 31, 2024 (the end of BC Hydro's fiscal year),
7 subject to BCUC approval.

8 BC Hydro also proposes to conduct annual monitoring and prepare an evaluation
9 report to consider the results and impacts of the rate in fall 2023 after the results for
10 the initial period (January 1, 2020 to March 31, 2021) and three complete fiscal
11 years (fiscal 2021, fiscal 2022 and fiscal 2023) are available. BC Hydro proposes
12 that the evaluation will consider the following:

- 13 (i) Ratepayer and participant economics;
- 14 (ii) Appropriateness of the energy charge adder;
- 15 (iii) Customer understanding and acceptance;
- 16 (iv) Practicality of administration; and
- 17 (v) Interactions and possible opportunities for synergies between the Incremental
18 Energy Rate Pilot and the Freshet Rate.

19 BC Hydro anticipates that completing the evaluation report in fall 2023 will provide
20 sufficient historical information regarding the results and impacts of the Incremental
21 Energy Rate Pilot, including having three complete fiscal years (fiscal 2021,
22 fiscal 2022 and fiscal 2023) of results pursuant to BC Hydro's customer baseline
23 load (**CBL**) annual review process under TS 74 for comparison. It will also provide
24 time for BC Hydro to conduct further analysis and consultation regarding whether
25 any changes to the rate should be made and whether it should be extended as a
26 pilot or made a permanent rate. As is the case with any rate schedule, BC Hydro

1 may apply to the BCUC to terminate the Incremental Energy Rate Pilot if conditions
2 warrant such application.

3 For baseline determination, the overlay of the Incremental Energy Rate Pilot with the
4 RS 1823 Stepped Rate is of critical importance. For this reason, BC Hydro proposes
5 to align the default annual period used for monthly RS 1893 baseline determination
6 with the most recent completed fiscal year for which each RS 1823 customer's
7 energy CBL under TS 74 has been approved by the BCUC. The proposed default
8 annual baseline determination period is Fiscal 2019 (i.e., the 12 calendar months
9 commencing April 1, 2018 and ending March 31, 2019). This approach will provide
10 both BC Hydro and the customer with certainty and transparency regarding normal
11 operations at the customer site, including the verified impact of events that have
12 increased or decreased historical energy consumption.

13 BC Hydro and its RS 1823 transmission service customers have 12 years of
14 experience with baseline determinations and adjustments in accordance with TS 74,
15 as well as four years of experience with baseline determinations and adjustments for
16 the Freshet Rate. Presently (i) all RS 1823 customer baselines set in accordance
17 with TS 74; and (ii) Freshet Rate baselines not based on the 2015 Freshet Period, or
18 which have been adjusted, remain subject to BCUC review and approval. Similarly,
19 BC Hydro expects to utilize existing staff resources for RS 1893 baseline
20 determinations and adjustments and will file any adjusted baselines with the BCUC
21 for final approval and consistent with TS 74 principles and criteria.

22 **5.4 Rate Design Elements**

23 BC Hydro has summarized each key element of its proposed rate design for the
24 Incremental Energy Rate Pilot below. The proposed RS 1893 is provided in
25 **Appendix C**. Capitalized terms in this section have the meanings given to them in
26 BC Hydro's Tariff or the proposed RS 1893, unless otherwise defined.

1 *Availability*

2 The rate is open to any RS 1823 or RS 1828 Customer that is not concurrently
3 taking service under the Freshet Rate.

4 *Energy Charge*

5 Net Incremental Energy in HLH and LLH will be priced using the ICE Day Ahead
6 Power Price Report for Mid-C Peak or Off Peak weighted average index prices,
7 applicable to the hour. A price floor of \$0/MWh will apply and there will be no price
8 cap. Daily Mid-C prices will be converted from U.S. dollars to Canadian dollars using
9 the Bank of Canada daily exchange rate on the applicable day(s).

10 *Demand Charge*

11 As the proposed RS 1893 is non-firm and interruptible, there is no demand charge
12 for load taken above the Monthly Reference Demand during HLH of the Billing
13 Period. The Billing Demand determination under RS 1823 or RS 1828 will
14 incorporate the lesser of Reference Demand and the actual highest kVA demand
15 during HLH in the Billing Period.

16 *Energy Charge Adder*

17 BC Hydro proposes to apply a \$3.00/MWh adder on net RS 1893 energy volumes
18 during the freshet Billing Periods of May through July and a \$7.00/MWh adder in all
19 other Billing Periods. BC Hydro considers that these adders and energy pricing will,
20 on an annual basis, be sufficient on an expected basis to recover its marginal cost of
21 energy and make a contribution to fixed costs to minimize risk to non-participants.³⁸

³⁸ Refer to section [5.5.2](#) of this application which describes the analysis undertaken to determine the appropriate adders that should apply.

1 *Definitions*

2 For defined terms used in RS 1893, BC Hydro has incorporated references to
3 RS 1823 and TS 5 and TS 6 (for direct service) and TS 87 and TS 88 (for indirect
4 service).

5 *HLH and LLH*

6 BC Hydro proposes to align the HLH and LLH definitions for the Incremental Energy
7 Rate Pilot with RS 1823 and RS 1828. This is to manage the billing system overlay
8 of firm electricity service under RS 1823 or RS 1828, as applicable, with non-firm
9 electricity service under RS 1893. For greater certainty, RS 1893 Customers will
10 continue to see a price signal for incremental energy that is reflective of daily Mid-C
11 On-Peak and Off Peak reference energy prices and which incorporate NERC
12 statutory holidays.

13 *Non-firm Service*

14 BC Hydro's proposed RS 1893 service is non-firm and interruptible. BC Hydro will
15 only provide service where it has energy and capacity to do so. BC Hydro has the
16 right to interrupt RS 1893 service for transmission and generation system
17 constraints. RS 1893 load will not be included in BC Hydro's load forecast. BC Hydro
18 will not advance any generation or network system investments to serve RS 1893
19 load.

20 *Eligibility*

21 BC Hydro has proposed that, to be eligible for RS 1893 service, the Customer must
22 have a minimum of two years of electricity consumption history. This is to ensure
23 that a new Customer has sufficient time for plant start-up and commissioning to
24 achieve normal operations. In BC Hydro's experience, new industrial customers
25 require at least two years of operations after grid energization to achieve normal
26 operations. For example, BC Hydro does not typically see a Customer request for
27 CBL determination under TS 74 until such time. No minimum size threshold is

1 proposed. Any RS 1823 or RS 1828 transmission customer that meets this criteria is
2 welcome to apply for RS 1893 service.

3 The Customer must also be able to satisfy BC Hydro that it can reduce load to its
4 Monthly Reference Demand within one hour of receiving notice from BC Hydro. The
5 one hour notice requirement is consistent with the eligibility criteria previously used
6 for the RTP rate. One hour is generally considered to be the acceptable operational
7 timeframe required for BC Hydro to mitigate the impact of an unplanned generation
8 constraint. The purpose of this requirement is to ensure that participant Customers
9 understand that RS 1893 service can be interrupted by BC Hydro on reasonable
10 notice and that they have the physical and/or technical ability to comply.

11 In general, to meet this eligibility requirement, the Customer will be required to
12 demonstrate in advance that it has, or plans to have: (a) a control centre or site
13 operations contact that can implement a curtailment notice from BC Hydro's control
14 centre on a 24x7 basis; and/or (b) automated load shedding capability installed with
15 appropriate telemetry and controls. BC Hydro is not proposing similar
16 implementation requirements for the Freshet Rate because the prospective need for,
17 and likelihood of, a system-based curtailment during the Freshet Period is
18 substantially less over the three months.

19 Notification procedures for service interruption will be set out in BC Hydro's System
20 Operating Order and incorporated into the Customer's Joint Local Operating Order.
21 Operating orders are standard for transmission service Customers. They contain
22 BC Hydro's technical protocols and procedures for interconnection and safe
23 operation of the Customer's transmission system with the BC Hydro transmission
24 system. They also include communication procedures for interrupting notifications,
25 or direct interrupting action, from BC Hydro and which are prescribed for specific
26 transmission and generation system constraint events.

1 *Notice to Request Service*

2 RS 1823 and RS 1828 Customers must notify BC Hydro by March 1 of each year
3 that they wish to take electricity under RS 1893 for the forthcoming Billing Year.

4 There are two exceptions to this notice requirement: (i) if the first year of the rate
5 pilot is approved by the BCUC effective January 1, 2020; and (ii) if a new RS 1823
6 Customer commences taking service during the Billing Year and still meets the
7 eligibility criteria (such as by acquiring an existing site with the required consumption
8 history). In these cases, the Customer must notify BC Hydro of its request for
9 RS 1893 service at least 30 days prior to the start of the next Billing Period. The
10 purpose of this notice is to provide BC Hydro with sufficient time to review and
11 determine RS 1893 baselines³⁹ with the Customer and update the billing system.

12 The Customer notice must include an estimate of the amount of incremental energy
13 that the Customer expects to take under the Incremental Energy Rate Pilot during
14 each Billing Period and a description of the operational and/or production changes,
15 as applicable, that the Customer plans to make at its plant to take advantage of this
16 pilot program.

17 *Customers with Self-generation*

18 BC Hydro is proposing that Customers with self-generation may elect to use
19 RS 1893 as an alternative to RS 1880 for the instantaneous pick-up of load due to
20 loss of self-generation. However, the Customer must choose one service or the
21 other. There is no ability to switch back and forth between RS 1893 and RS 1880.
22 For example, a customer taking RS 1893 service can subsequently elect to take
23 RS 1880 service at any time during the Billing Year. Where this occurs, the customer
24 will be automatically cancelled out of RS 1893 for the remainder of the Billing Year in
25 accordance with Special Condition 13, but remain eligible to request RS 1880

³⁹ There are various factors that may result in BC Hydro's baseline determination taking longer than 30 days. For example, customer requests for baseline adjustment may be subject to engineering review by BC Hydro and BCUC approval. Further, the customer's Local Operating Order must be amended and executed to incorporate the provision of RS 1893 service.

1 service for any event of forced or planned generator outage. The Customer must
2 wait until March 1 before being eligible to re-enrol in the Incremental Energy Rate
3 Pilot.

4 **RS 1893 Baseline Determination**

5 For a Customer with at least two years of consumption history, the default period for
6 determining HLH and LLH Baselines and Monthly Reference Demand will be the
7 365 days of BC Hydro’s fiscal 2019.⁴⁰ A unique HLH and LLH Baseline and Monthly
8 Reference Demand will be determined for each Billing Period of Fiscal 2019. This
9 will result in 36 unique baselines (one HLH Baseline, one LLH Baseline and one
10 Monthly Reference Demand for each of the 12 Billing Periods). An illustrative
11 example of the baselines that will be determined for a Customer is provided in
12 [Figure 17](#) below.

13 **Figure 17 Illustrative Monthly RS 1893 Energy and**
14 **Demand Baselines**

BC Hydro - RS 1893 Baselines for Incremental Energy Rate						RS 1893 Energy and Demand Baselines		
Customer: ABC Pulp & Paper						<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Monthly HLH & LLH Baselines</p> <p>↓ (F)</p> </div> <div style="text-align: center;"> <p>↓ (G)</p> </div> <div style="text-align: center;"> <p>↓ (H)</p> </div> </div>		
Site: ABC Pulp & Paper								
Account(s): 12345								
Period: April 1, 2018 - March 31, 2018								
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Month	Sum of hourly HLH interval data (kWh)	# of HLH Hours	Sum of hourly LLH interval data (kWh)	# of LLH Hours	Total Billed RS1823 Energy (kWh)	HLH Energy Baselines (kWh/hr) = (A/B)	LLH energy Baselines (kWh/hr) = (C/D)	Monthly Reference Demand (kVA) = actual billed demand
Apr-18	22,820,352	384	19,172,008	336	41,992,360	59,428	57,060	66,158
May-18	18,632,155	416	15,232,399	328	33,864,554	44,789	46,440	53,198
Jun-18	18,255,455	416	14,776,179	304	33,031,634	43,883	48,606	53,198
Jul-18	18,100,122	400	16,536,045	344	34,636,167	45,250	48,070	53,198
Aug-18	24,442,880	416	20,384,090	328	44,826,970	58,757	62,147	65,630
Sep-18	24,088,453	400	19,586,980	320	43,675,433	60,221	61,209	64,072
Oct-18	19,793,080	400	16,166,932	344	35,960,012	49,483	46,997	64,336
Nov-18	24,937,651	400	20,832,295	321	45,769,946	62,344	64,898	65,973
Dec-18	24,750,890	400	21,105,322	344	45,856,212	61,877	61,353	64,416
Jan-19	24,309,628	416	20,810,284	328	45,119,912	58,437	63,446	66,158
Feb-19	19,342,677	368	17,418,004	304	36,760,681	52,562	57,296	63,967
Mar-19	22,576,143	416	18,810,399	327	41,386,542	54,270	57,524	65,419

⁴⁰ Fiscal 2019 is the most recent fiscal year for which customers have a final Energy CBL 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 *RS 1893 Baseline Adjustments*

2 If a Customer's RS 1893 baselines are no longer representative of the Customer's
3 normal historical electricity usage absent the Incremental Energy Rate Pilot, then
4 BC Hydro will make adjustments to those baselines consistent with the principles
5 and criteria set out in TS 74. BC Hydro and the Customer will first review any
6 proposed adjustments to ensure they are representative of the Customer's normal
7 consumption. As with TS 74 baseline adjustment criteria, a key review principle for
8 proposed baseline adjustments is to consider the magnitude, complexity and
9 materiality of the change given the potential impact to 36 unique baselines
10 (e.g., three baselines for each of 12 months). BC Hydro will then file any adjusted
11 RS 1893 baselines with the BCUC for approval. In cases where BC Hydro and the
12 Customer cannot reach agreement, the BCUC will determine the final RS 1893
13 baselines. Once any adjusted RS 1893 baselines have been filed, they will be
14 applied for billing on an interim basis subject to BCUC approval. No retroactive
15 billing adjustments will be made unless directed by the BCUC.

16 *Limitation of RS 1893 Usage for RS 1823 customers*

17 The proposed Special Condition 10 of RS 1893 is designed to mitigate the risk of
18 unintended use of incremental energy by limiting the amount of electricity a
19 customer may purchase under RS 1893. This limitation on RS 1893 usage is equal
20 to the baseline amount of electricity the customer purchases under RS 1823.
21 Pursuant to Special Condition 10, if a customer's highest kVA Demand in HLH of a
22 Billing Period is greater than the Monthly Reference Demand applicable to that
23 Billing Period multiplied by 2.0, then: (i) the Monthly Reference Demand for that
24 Billing Period will be automatically adjusted to be equal to 50 per cent of the highest
25 kVA Demand in HLH during that Billing Period; and (ii) the HLH and LLH Baselines
26 for that Billing Period will be automatically adjusted to be equal to 50 per cent of the
27 total energy volumes taken by the customer in the HLH and LLH of that Billing
28 Period. The adjustments to the Monthly Reference Demand and the HLH and LLH

1 Baselines made pursuant to Special Condition 10 will be effective as of the start of
2 the Billing Period in which the excess electricity was used. The adjusted Monthly
3 Reference Demand and the adjusted HLH and LLH Baselines will remain in effect
4 for that calendar month in future years of the RS 1893 pilot.

5 This limitation on RS 1893 usage would allow a customer to take service under
6 RS 1893 to re-start a second line or add a shift, for example, but would mitigate the
7 potential for a customer to purchase significant excess volumes of non-firm
8 electricity under RS 1893 that BC Hydro considers would normally be purchased
9 under RS 1823. This provision does not apply to customers served under RS 1828
10 because it would unnecessarily restrict the customer's ability to turndown
11 self-generation and increase load (primarily during the freshet period), which is a
12 desired outcome of the rate.

13 Administration of this provision will require monthly monitoring of participant
14 customer electricity consumption by BC Hydro. No BCUC approval is contemplated
15 for the adjusted baselines as the adjustment is formulaic and made in accordance
16 with Special Condition 10 of RS 1893.

17 *Change in Site Ownership*

18 BC Hydro is proposing that RS 1893 baselines which have been determined for a
19 Customer taking service under RS 1823 or RS 1828 be maintained for the site even
20 if there is a change in ownership without need for adjustment or BCUC approval.⁴¹ If
21 the new site owner expects to operate the site differently, such that existing site
22 baselines are no longer representative of normal RS 1823 or RS 1828 consumption,
23 new RS 1893 baselines will be determined by BC Hydro in consultation with the
24 customer and require approval by the BCUC.

⁴¹ This approach is consistent with the assignment of the Energy CBL under TS 74.

1 *Billing/Monthly Settlement*

2 The following are the proposed RS 1893 energy billing steps:

- 3 • HLH and LLH baselines are calculated as the average hourly purchases under
4 RS1823 or RS 1828 in the HLH and LLH hours, respectively, for each calendar
5 month of the baseline year;
- 6 • HLH and LLH Gross Incremental Energy is calculated hourly in excess of the
7 applicable HLH and LLH baselines and summed for the Billing Period;
- 8 • HLH and LLH Net Incremental Energy is determined for the Billing Period and is
9 equal to, respectively, the total metered energy in HLH and LLH of the Billing
10 Period that is greater than the total baseline energy in HLH and LLH of the
11 Billing Period;
- 12 • A monthly Net to Gross Energy ratio is calculated for each of HLH and LLH for
13 each Billing Period. The ratio is equal to HLH (or LLH) Net Incremental Energy
14 divided by HLH (or LLH) Gross Incremental Energy for each Billing Period, and
15 is expressed as a percentage. The ratio is equal to 100 per cent if HLH (or LLH)
16 Gross Incremental Energy equals or exceeds HLH (or LLH) baseline energy in
17 each hour of the Billing Period; otherwise, the ratio is less than 100 per cent;
- 18 • The resultant HLH (or LLH) ratio is applied to Gross Incremental Energy in HLH
19 (or LLH) on each day of the Billing Period to determine the daily volume of
20 RS 1893 HLH (or LLH) energy;⁴² and
- 21 • The daily RS 1893 HLH (or LLH) energy volume is then multiplied by the daily
22 Mid-C Peak (or Off-Peak) energy price. Daily Mid-C energy prices are
23 converted from US\$ to C\$ using the daily Bank of Canada exchange rate. An

⁴² The application of the HLH and LLH ratio is required to ensure that RS 1893 pricing applies only to total energy purchases above baseline for each Billing Period. If the ratio were not applied, then the approach of setting Gross Incremental Energy to zero for hours where purchases were below baseline could result in RS 1893 pricing being applied to energy that might otherwise have been charged under RS 1823 or RS 1828.

1 energy charge adder of \$3 per MWh in the freshet Billing Periods, and
2 \$7.00 per MWh in all other Billing Periods, is applied to net RS 1893 energy
3 volumes.

4 BC Hydro refers to this billing methodology as monthly settlement. This approach is
5 responsive to feedback received through the consultation process that customers
6 were seeking monthly billing settlement and stable adder pricing. It is also practical
7 and efficient for monthly billing as no after-the-fact reconciliation is required.

8 *Cancellation and Opt In/Out Provisions*

9 There are automatic and voluntary cancellation provisions in RS 1893. Acting
10 reasonably, BC Hydro has the discretion to automatically cancel RS 1893 service
11 where: (i) a customer does not respond to a BC Hydro curtailment notice; and
12 (ii) where a customer with self-generation requests RS 1880 service in place of
13 RS 1893 service in order to prevent the customer from switching between the two
14 rates. On a voluntary basis, the subscribing customer can elect to opt-out of the pilot
15 by providing written notice to BC Hydro at any time.

16 In all cases of cancellation, BC Hydro will terminate RS 1893 service for the entire
17 Billing Period in which the cancellation occurs. BC Hydro will not rebill for any
18 Electricity supplied under RS 1893 in a prior Billing Period. If supply under RS 1893
19 is cancelled, all electricity supplied will be billed under RS 1823 or RS 1828 and/or
20 RS 1880, as applicable.

21 Further, after cancellation, whether automatic or voluntary, the customer is not
22 eligible to re-enrol for RS 1893 service for the balance of the current Billing Year.
23 This will prevent customers having the ability to “opt in/out” of the rate depending on
24 the price of firm Electricity service under RS 1823 or RS 1828 and non-firm
25 electricity service under RS 1893 and/or RS 1880.

1 Importantly, BC Hydro also notes that subscribing RS 1823 Customers remain
2 subject to the terms and conditions of TS 74, including Energy CBL resets, for
3 annual RS 1823 energy purchases. While BC Hydro acknowledges that some
4 participating customers might have the capability to shift a portion of their load from
5 RS 1823 to RS 1893, the prospect of Energy CBL annual reset under TS 74
6 significantly mitigates this risk. This is because Energy CBL annual reset could result
7 in a material change to the mix of RS 1823 Tier 1 and Tier 2 energy purchases for
8 the Customer's baseline load. All else being equal, this would increase the cost of
9 RS 1823 energy for participant customers who have made prior investments in
10 conservation and operational efficiency. Accordingly, the prospective financial
11 consequence of Energy CBL reset is a significant deterrent to load shifting.
12 BC Hydro will consider the impact of load shifting and/or Energy CBL reset and any
13 associated revenue impacts in its evaluation of the Incremental Energy Rate Pilot.

14 *Treatment of Customers with an EPA*

15 BC Hydro has confirmed in its proposed RS 1893 that a Customer with an EPA
16 and/or LDA is not eligible to receive a financial payment from BC Hydro for
17 generator turndown and simultaneously benefit from lower market reference-priced
18 energy for any associated increase in electricity purchases from BC Hydro. While
19 BC Hydro does not envision any circumstance where this would occur, the provision
20 is included for completeness and transparency.

21 **5.5 Economic Justification and Ratepayer Impacts**

22 **5.5.1 Overview**

23 BC Hydro uses energy study models designed to optimize BC Hydro's system
24 operations through representation of the components of BC Hydro's load,
25 transmission network, generating system, EPAs and external markets. The models
26 incorporate market prices, inflows and weather conditions for each day of each
27 forecast year for a set of historical weather scenarios. On a forecast basis, BC Hydro

1 uses these models to determine an optimal set of reservoir and generating station
2 operations and market transactions, based on current forecast information. Five
3 primary characteristics underpin this modeling approach:

- 4 • Account for uncertainty;
- 5 • Optimize the most flexible resources;
- 6 • Maximize consolidated net revenue from operations;
- 7 • Use reservoir marginal values (price signals); and
- 8 • Produce risk-neutral forecasts.

9 The energy modeling process has been described in numerous BCUC proceedings,
10 including at a workshop as part of the BC Hydro Fiscal 2012 to Fiscal 2014 Revenue
11 Requirements Application (**RRA**) proceeding and in BC Hydro's response to
12 BCUC IR 1.15.1.1 as part of BC Hydro's Fiscal 2017 to Fiscal 2019 RRA
13 proceeding.

14 BC Hydro used its forecast⁴³ of system marginal value from the energy study models
15 in estimating the ratepayer impact of serving incremental customer load under the
16 proposed Incremental Energy Rate Pilot for the pilot period. This methodology and
17 approach is consistent with the ratepayer impact analysis described in the Final
18 Evaluation Report and the 2019 evaluation report for Year 4.

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

22 For the Incremental Energy Rate Pilot:

⁴³ Based on BC Hydro's October 2018 Energy Study which is used as the basis for the Cost of Energy forecast in the Fiscal 2020 to Fiscal 2021 RRA.

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

6 The estimated ratepayer impact of the Incremental Energy Rate Pilot is based on the
7 forecast system marginal values and the following factors:

- 8 • Customer-specific forecasts of incremental RS 1893 load;
- 9 • Customer-specific assumptions of ‘strike price’ (i.e., the estimated price at
10 which the customer will stop taking incremental load and/or turndown to their
11 baseline);
- 12 • Forecast daily Mid-C market prices in HLH and LLH; and
- 13 • An energy charge adder in \$/MWh.

14 **5.5.2 Energy Charge Adder Modeling**

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

24 BC Hydro’s financial modeling is designed to estimate forecast incremental energy
25 volumes and net revenue for the Incremental Energy Rate Pilot. The model

1 incorporates forward-looking data inputs for the three-year period of
2 fiscal 2020 to fiscal 2022. The results are sensitive to BC Hydro's forecast of system
3 marginal values, forecast Mid-C market prices, assumed customer-specific
4 incremental consumption and energy charge adder pricing.

5 Key model assumptions are as follows:

- 6 • \$55/MWh all-in customer strike price for incremental non-firm load;
- 7 • Model incorporates 46 years of historical weather sequences with the impact of
8 natural gas price and weather on forward Mid-C market prices;
- 9 • Model calculates the difference between forward Mid-C prices and the expected
10 value of energy in the system to estimate the BC Hydro ratepayer impact; and
- 11 • Results are preliminary, illustrative and subject to change.

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

16 **5.5.3 Assessment of Energy Adder Alternatives**

17 In consultation with internal staff, customers and AMPC, BC Hydro has refined its
18 modeling and assessment of energy adder pricing alternatives. A total of six energy
19 charge adder alternatives were assessed, as shown in [Table 6](#) below.

1
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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

- 3 • Option A for each alternative represents a flat monthly energy charge adder,
 4 which varies between the three freshet months of May to July and the nine
 5 non-freshet remainder months only.
- 6 • Option B for each alternative represents a monthly energy charge adder that
 7 varies (is shaped) by calendar month using the following categories:
- 8 ▶ Winter months (October – March);
 - 9 ▶ Freshet months (May – July); and
 - 10 ▶ Shoulder months (April, August, September)

11 In [Table 7](#) to [Table 12](#) below, BC Hydro presents the results of its system modeling
 12 for each of the six energy charge adder alternatives that were assessed and which
 13 correspond to these alternatives. All six alternatives assume a flat energy charge
 14 adder of \$3/MWh in the freshet months. Accordingly, the only variable that is
 15 changing in the analysis is the price of the energy adder in non-freshet months as
 16 set out in [Table 6](#).

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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

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 4

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

 5
 6

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

1
 2

Table 10 Option 2B – Shaped Adder in Non-freshet months that averages \$7/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

 3
 4

Table 11 Option 3A – Flat \$6/MWh Adder in Non-freshet months

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1150	<u>kCAD</u>
10th Percentile Net Revenue	-460	<u>kCAD</u>
50th Percentile Net Revenue	1122	<u>kCAD</u>
90th Percentile Net Revenue	2719	<u>kCAD</u>
Expected Incremental Load	268	<u>GWh</u>
10th Percentile Incremental Load	246	<u>GWh</u>
50th Percentile Incremental Load	274	<u>GWh</u>
90th Percentile Incremental Load	283	<u>GWh</u>

 5
 6

Table 12 Option 3B – Shaped Adder in Non-freshet months that averages \$6/MWh

RESULTS (all values on a per year basis):		
Expected Incremental Load Net Revenue	1131	kCAD
10th Percentile Net Revenue	-465	kCAD
50th Percentile Net Revenue	1110	kCAD
90th Percentile Net Revenue	2696	kCAD
Expected Incremental Load	267	GWh
10th Percentile Incremental Load	246	GWh
50th Percentile Incremental Load	273	GWh
90th Percentile Incremental Load	283	GWh

5.5.4 BC Hydro's Energy Charge Adder Proposal

In general, based on the initial modeling of ratepayer impact, BC Hydro is financially indifferent on an annualized expected revenue basis as between the flat and shaped adder pricing alternative for each option (i.e., as between Option A and Option B). That is, the forecast net revenue is similar in either case. Further, the forecast revenue differences between Options 1, 2 and 3 are not substantial, as shown in [Table 13](#) below.

Table 13 Summary of Expected Net Revenue by Adder Option

ENERGY CHARGE ADDER ALTERNATIVES	ADDER (\$/MWh)	Expected Incremental Load (GWh)	Expected Incremental Net Revenue (\$M)
Option 1A - Flat	\$ 6.00	264	\$ 1.47
Option 1B - Shaped		263	\$ 1.45
Option 2A - Flat	\$ 7.00	266	\$ 1.32
Option 2B - Shaped		265	\$ 1.29
Option 3A - Flat	\$ 8.00	268	\$ 1.12
Option 3B - Shaped		267	\$ 1.13

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.

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

-
- 1 • At the 90th percentile, there is a 10 per cent chance that BC Hydro would see a
2 forecast annual net revenue gain of approximately \$2.9 million or more for
3 approximately 282 GWh of incremental energy sales.

4 BC Hydro would also support using Option 2B if that is the BCUC's preference.
5 Although the modeling indicates that there is no material financial difference
6 between Option 2A and Option 2B on an annualized basis, BC Hydro does consider
7 the shape of the energy charge adder in Option 2B to provide a price signal that
8 better matches monthly pricing signals with prospective costs and risks.

9 **5.5.5 Discussion of Risks**

10 The scenarios under which a net revenue loss could occur are similar to those
11 described in **Appendix E**. This includes the scenario of a low inflow year (such as
12 2018/19) with an increased risk that market energy imports or higher value system
13 energy might be used to serve incremental energy under the Incremental Energy
14 Rate Pilot in any given hour. Under this scenario, there is an increased risk that
15 BC Hydro will not recover its marginal cost of energy in those hours. For example:

- 16 • For any day where market energy imports are deemed to serve incremental
17 RS 1893 load, BC Hydro would see an approximate net revenue loss equal to
18 the difference between the RS 1893 energy charge adder collected and the
19 current US\$5.16 /MWh wheeling cost for delivery from the Mid-C market to the
20 B.C. Border plus 1.9 per cent transmission losses deemed to be paid
21 (converted to Canadian dollars daily). On days where the market price is
22 negative, the revenue loss from deemed market imports would be reduced by
23 the difference between the actual market price and the \$0/MWh floor price
24 under RS 1893; and
- 25 • For any day where basin energy is deemed to serve incremental RS 1893
26 loads, the difference between the value of actual RS 1893 energy sales and
27 BC Hydro's System Marginal Value would be used to determine the revenue

1 gain or loss on that day. If system conditions are characterized by low reservoir
2 levels and below average inflows, there would be a bias towards higher system
3 marginal prices. In turn, this can lead to higher revenue losses if the marginal
4 value of water in the system is higher than the Mid-C marginal energy prices
5 (plus adder) used as a reference for RS 1893 pricing.

6 Another scenario that was described is a low inflow year with limited market energy
7 available. This might occur, for example, where BC Hydro has to buy replacement
8 energy from the market during a current period to help serve domestic load at some
9 future period. There could be a net revenue loss if BC Hydro uses lower cost market
10 energy to serve Incremental Energy Rate Pilot load in real time during a low market
11 price period rather than storing that energy in large reservoirs for later domestic use
12 during a higher market price period. This net revenue loss impact would be in
13 addition to the adder potentially not covering the cost of wheeling described above.
14 The net revenue loss impact will be greater if the future market energy import is
15 priced higher than the freshet market energy import and will be lower if the future
16 market energy import is priced lower than the freshet market energy import.

17 An additional scenario which could occur is if, in high load periods, BC Hydro has to
18 reduce its sales of energy to market to serve Incremental Energy Rate Pilot load,
19 there may be a revenue loss if the forgone export would have been at a higher price
20 than the price of the Incremental Energy Rate. BC Hydro notes this risk may be low
21 given the situation is more likely to occur during high priced periods, which may have
22 lower customer participation as described in the final paragraph of section [5.2](#).

1 **5.6 Incremental Energy Rate Pilot Bonbright Assessment**

 2 [Table 14](#) shows BC Hydro's Bonbright assessment of the Incremental Energy Rate
 3 Pilot:

 4 **Table 14 Incremental Energy Rate Pilot Bonbright**
 5 **Assessment**

Bonbright Criteria	2015 RDA Grouping	Performance	Remarks
1. Price signals to encourage efficient use and discourage inefficient use	Economic Efficiency	Good	The energy charge sends an efficient price signal to the customers as it is based on the ICE Mid-Columbia market price index, which is expected to generally reflect BC Hydro's marginal cost of energy.
2. Fair apportionment of costs among customers	Fairness	Good	The Incremental Energy Rate Pilot is expected to recover the marginal cost of energy used to serve Incremental Energy Rate Pilot customers and make some contribution to fixed costs.
3. Avoid undue discrimination	Fairness	Good	The Incremental Energy Rate Pilot is available to all RS 1823 and RS 1828 customers.
4. Customer understanding and acceptance; practical and cost effective to implement	Practicality	Fair	Customers understand the Incremental Energy Rate Pilot since it has a similar rate structure to the Freshet Rate and are in favour of its approval. The Incremental Energy Rate Pilot includes 36 baselines and monthly reconciliation for billing which is more complex to administer than a traditional rate structure.

Bonbright Criteria	2015 RDA Grouping	Performance	Remarks
5. Freedom from controversies as to proper interpretation	Practicality	Fair	Same as Bonbright criterion 4 above.
6. Recovery of the revenue requirement	Stability	Fair/Good	The Incremental Energy Rate Pilot is expected to recover the marginal cost of energy and make some contribution to fixed costs. For RS 1823 or RS 1828 baseline load, there is stable recovery of the revenue requirement.
7. Revenue stability	Stability	Fair/Good	Incremental Energy Rate Pilot revenue will be relatively stable and predictable based on each customer's pre-determined load and price criteria. Revenue changes will closely match cost changes that arise from changes in customer load because RS 1893 pricing generally reflects marginal cost.
8. Rate stability	Stability	Fair/Good	The Incremental Energy Rate Pilot is based on a daily market price index which can be volatile. However, customers choosing to participate will be aware of the potential for volatility in advance and can adjust energy use to reflect their unique economics. Customers can choose to reduce consumption of incremental energy when market prices are high and continue to receive firm service with stable and predictable pricing under RS 1823 for baseline load.

1 **5.7 Proposed Evaluation Criteria and Reporting**

2 BC Hydro proposes to evaluate the Incremental Energy Rate Pilot, and will provide
3 an evaluation report to the BCUC. This evaluation is expected to be undertaken after
4 completion of the third full fiscal year of the pilot (fiscal 2023) and will be filed with
5 the BCUC in fall 2023. The evaluation will include:

6 (a) Estimates of the costs and benefits of the Incremental Energy Rate Pilot. This
7 will be determined on an overall ratepayer basis, and will employ the same
8 economic analysis approach used in the Freshet Rate evaluation reports;

9 (b) Estimate of participant benefit based on the unit cost reduction of incremental
10 electricity;

11 (c) Estimate of incremental energy sales and revenue;

12 (d) Assessment of whether risk mitigation measures such as the energy charge
13 adder were sufficient to protect non-participants from harm;

14 (e) Tracking of number of existing and new RS 1823 customers and RS 1828
15 customers that used the rate and volumes of use;

16 (f) Assessment of customer use of the rate and determination of customer load
17 response to Mid-C electricity prices;

18 (g) Assessment of any implementation issues – such as baseline determination,
19 customer communication, and billing of incremental energy;

20 (h) Assessment of customer satisfaction regarding the rate;

21 (i) Review any interruption of customers under non-firm provisions of the rate;

22 (j) Assessment of the impact of self-generation outages and/or curtailments and
23 whether customers used the rate as a substitute for RS 1880;

24 (k) Examination of whether load shifting by customers occurred and an
25 assessment of the impact;

-
- 1 (l) Assessment of the usage of the Incremental Energy Rate Pilot compared to the
2 usage of the Freshet Rate during the freshet period; and
- 3 (m) Assessment of the Incremental Energy Rate Pilot impact on RS 1892 and
4 RS 1880 service options to determine if BC Hydro should continue to offer
5 multiple optional non-firm rates or a single non-firm service.

6 BC Hydro anticipates that the evaluation report will help guide whether any changes
7 to the Incremental Energy Rate Pilot will need to be made and whether it should be
8 made a permanent rate.

9 **5.8 Conclusion**

10 The proposed Incremental Energy Rate Pilot is a prudent and sensible expansion of
11 the Freshet Rate. It would be available to all eligible RS 1823 and RS 1828
12 transmission service customers and would provide customers with a flexible rate
13 option for non-firm electricity service. Further, based on the analysis above,
14 BC Hydro considers that the Incremental Energy Rate Pilot can be offered to
15 participant customers while minimizing risk of harm to non-participants. BC Hydro's
16 economic analysis of the rate shows that there is a relatively small risk of a net
17 revenue loss. This analysis is predicated on the difference between forward Mid-C
18 prices (adjusted for adders) and the expected value of energy in the BC Hydro
19 system. On a prospective basis, BC Hydro considers that there is a significantly
20 higher likelihood of a net revenue gain and positive ratepayer benefit than of a net
21 revenue loss. Since the proposed rate is a pilot, BC Hydro intends to assess as part
22 of its evaluation the net revenue impact on ratepayers and whether the risk
23 mitigation measures contemplated in this application were sufficient.

24 Since the 2013 IEPR, industrial customers and AMPC have requested rate design
25 alternatives that incent efficient use and provide exposure to market
26 reference-priced energy on a year round basis. The Incremental Energy Rate Pilot
27 design is responsive to this feedback. Through this application, BC Hydro has

1 demonstrated that it has listened to, understood, and acted to meet the needs of its
2 transmission service customers.

3 BC Hydro considers the proposed rate design and associated terms and conditions
4 to: (i) provide benefits to participant customers in the form of lower electricity costs
5 for incremental use; (ii) provide benefits to all ratepayers by setting pricing that is
6 sufficient to cover, on an expected basis, BC Hydro's marginal cost of energy and
7 make some contribution to fixed costs and (iii) minimize risk to all ratepayers and
8 protect non-participant customers from harm; by requiring service to be non-firm and
9 interruptible. Energy pricing will be based on the Mid-C market price plus an
10 appropriate adder, which BC Hydro considers will be sufficient to recover
11 BC Hydro's marginal cost of energy. The use of an energy charge adder is a simple
12 and effective way to make a contribution to fixed costs on an expected basis and
13 mitigate prospective risks of revenue under-recovery where the Mid-C price varies
14 from BC Hydro's marginal cost of energy.

15 Finally, BC Hydro has experience in the use of market-referenced energy pricing in
16 rates. The proposed Incremental Energy Rate Pilot is compatible with the Freshet
17 Rate design and BC Hydro's experience in offering other market reference-priced
18 rates such as the RTP rate. BC Hydro proposes to apply its experience and
19 expertise in baseline determination and adjustment to ensure a clear distinction
20 between firm and non-firm service, with continued BCUC oversight to ensure
21 transparency. For all of the above reasons, BC Hydro considers that the proposed
22 Incremental Energy Rate Pilot is fair, just, reasonable and not unduly discriminatory.

Transmission Service Market Reference Priced Rates Application

Appendix A

Draft Orders

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Vancouver, BC Canada V6Z 2N3
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ORDER NUMBER
G-xx-xx

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

and

British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application (the Application)

BEFORE:

Commissioner
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. On October 31, 2019, BC Hydro filed an Application which included a request for approval of an amended Freshet Rate (Rate Schedule 1892) and approval for a new optional rate, the Incremental Energy Rate Pilot (Rate Schedule 1893), to be offered on a non-firm, interruptible basis for electricity usage above normal firm service (RS 1823 or RS 1828) baseline amounts and available as a pilot until March 31, 2024;
- B. BC Hydro states that the Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but it would be offered on a year round basis. BC Hydro states that it has consulted extensively with transmission service customers, the Association of Major Power Customers of BC (AMPC) and other stakeholders and that there is strong customer support for the optional Incremental Energy Rate Pilot to be offered on a pilot basis;
- C. BC Hydro requests that the Incremental Energy Rate be approved effective January 1, 2020 on an interim and non-refundable basis, as explained further in the Application. This is supported by AMPC, certain customers and the Ministry of Energy, Mines and Petroleum Resources;
- D. The BCUC has reviewed the Application and finds the approval of the Incremental Energy Rate effective January 1, 2020 on an interim and non-refundable basis to be warranted;

NOW THEREFORE the BCUC, pursuant to sections 58 to 60, 90 and 91 of the *Utilities Commission Act* and section 15 of the *Administrative Tribunals Act*, orders as follows:

1. The Incremental Energy Rate Pilot (RS 1893 - Transmission Service – Incremental Energy Rate Pilot) as shown in Appendix C of the Application is approved effective January 1, 2020 on an interim and non-refundable basis as requested in the Application, until further Order of the Commission.
2. BC Hydro is directed to file updated tariff sheets regarding the interim approval of RS 1893 within 15 business days of the date of this Order.

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

Suite 410, 900 Howe Street
 Vancouver, BC Canada V6Z 2N3
P: 604.660.4700
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ORDER NUMBER
G-xx-xx

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

and

British Columbia Hydro and Power Authority (BC Hydro)
 Transmission Service Market Reference-Priced Rates Application (the Application)

BEFORE:

Commissioner
 Commissioner
 Commissioner

on Date

ORDER

WHEREAS:

- A. As part of the 2015 Rate Design Application filed on September 24, 2015, BC Hydro sought approval for a new optional rate schedule (RS) 1892 – Transmission Service - Freshet Energy, which provides participating customers market pricing for incremental consumption during the freshet period (May 1 to July 31 inclusive) on a pilot basis ending December 31, 2017 (the Freshet Rate Pilot). RS 1892 was approved by BCUC Order No. G-17-16. BC Hydro was also ordered to file three evaluation reports of the Freshet Rate Pilot: two preliminary reports and one final report;
- B. In compliance with BCUC Order No. G-17-16, BC Hydro filed its preliminary evaluation report for year one on December 8, 2016 (Appendix D to the report was filed on January 27, 2017);
- C. On December 8, 2017, BC Hydro filed its preliminary evaluation report for year two in compliance with BCUC Order No. G-17-16;
- D. On December 8, 2017, BC Hydro, along with the submission of its preliminary evaluation report for year two, applied for approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, for extension of the termination date of RS 1892 - Transmission Service - Freshet Energy to include a third year so that the rate schedule would expire on December 31, 2018. BC Hydro also proposed to extend the timeline for filing the final Freshet Rate Pilot evaluation report from spring 2018, as outlined in the 2015 RDA, to fall 2018. The BCUC approved the requested extension of the rate and also the proposed timing of the final evaluation report by BCUC Order No. G-45-18;
- E. On April 8, 2019, BC Hydro applied for approval for an extension of RS 1892 effective from May 1, 2019 until December 31, 2019. This request was approved by Commission Order No. G-106-19 on May 22, 2019, which also directed BC Hydro to submit an evaluation report for the Freshet Pilot for 2019, on or before

.../2

October 31, 2019. The Order also directed BC Hydro to file an Application with the BCUC for a permanent Freshet Rate on or before September 30, 2019. On August 23, 2019, BC Hydro applied to the BCUC for a one-month extension to file its application for a permanent Freshet Rate from September 30, 2019 to October 31, 2019. This request was approved by Commission Order No. G-224-19 which directs BC Hydro to file its application for a permanent Freshet Rate, together with the 2019 Freshet Rate Pilot evaluation report, no later than October 31, 2019;

- F. On October 31, 2019, BC Hydro filed the 2019 Freshet Rate Pilot evaluation report in compliance with Commission Order No. G-224-19;
- G. On October 31, 2019, BC Hydro also filed an Application which included a request for approval of an amended Freshet Rate (Rate Schedule 1892) to be made an ongoing rate with no fixed termination date, commencing April 1, 2020. The amended Freshet Rate contains house-keeping amendments and new terms and conditions which BC Hydro and customers identified through the stakeholder engagement process;
- H. BC Hydro states that the requested amended Freshet Rate is supported by the success of the previously approved Freshet Rate which had good customer participation and a positive estimated ratepayer benefit. BC Hydro expects that the Freshet Rate will continue to provide benefits to participants and ratepayers if market conditions are similar to the conditions experienced over the four-year pilot period. BC Hydro conducted extensive stakeholder consultation with existing transmission service customers and with the Association of Major Power Customers of B.C. (**AMPC**), which support the Freshet Rate being offered on an on-going basis;
- I. In the Application, BC Hydro is also requesting approval for a new optional rate, the Incremental Energy Rate Pilot (Rate Schedule 1893), to be offered on a non-firm, interruptible basis for electricity usage above normal firm service (RS 1823 or RS 1828) baseline amounts and available as a pilot until March 31, 2024;
- J. BC Hydro states that the Incremental Energy Rate Pilot is similar in concept and design to the Freshet Rate, but it would be offered on a year round basis. BC Hydro states that it has consulted extensively with transmission service customers, AMPC and other stakeholders and that there is strong customer support for the optional Incremental Energy Rate Pilot to be offered on a pilot basis;
- K. By Order [##] dated [DATE] the BCUC granted approval for BC Hydro to provide service pursuant to Rate Schedule 1893 effective January 1, 2020 on an interim and non-refundable basis;
- L. The BCUC has reviewed the Application and finds the approval of the amended Freshet Rate and Incremental Energy Rate Pilot to be warranted.

NOW THEREFORE the BCUC, pursuant to sections 58 to 60 of the *Utilities Commission Act*, orders as follows:

1. The amended Freshet Rate (RS 1892 – Transmission Service - Freshet Energy) as shown in Appendix B of the Application is approved effective April 1, 2020.
2. The Incremental Energy Rate Pilot (RS 1893 - Transmission Service – Incremental Energy Rate Pilot) as shown in Appendix C of the Application is approved effective January 1, 2020 and terminates on March 31, 2024.
3. BC Hydro is directed to file updated tariff sheets regarding the Freshet Rate and Incremental Energy Rate Pilot within 15 business days of the date of this Order.

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

**Transmission Service Market Reference
Priced Rates Application**

Appendix B

**Amended Freshet RS 1892 (On-going)
Clean and Black-Lined**

5. TRANSMISSION SERVICE**RATE SCHEDULE 1892 – TRANSMISSION SERVICE – FRESHET ENERGY**

Availability	<p>For Customers supplied with Electricity under Rate Schedule 1823 (Transmission Service - Stepped Rate) or Rate Schedule 1828 (Transmission Service – Biomass Energy Program) that increase their Electricity usage during the Freshet Period, subject to the Special Conditions below.</p> <p>If a Customer is eligible to take service under this Rate Schedule and Rate Schedule 1893 (Incremental Energy Rate), the Customer may only take service under one of these Rate Schedules in any Billing Year, with the exception of the period ending March 31, 2021.</p>
Applicable in	Rate Zone I excluding the Districts of Kingsgate-Yahk and Lardeau-Shutty Bench.
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"> 1. The greater of <ol style="list-style-type: none"> (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 2. A \$3/MWhadder.
Definitions	Terms used in this Rate Schedule have the meanings given to them in Electric Tariff Supplement Nos. 5 or 87, and Rate Schedule 1823 or Rate Schedule 1828, as applicable, unless otherwise defined. In addition, the following terms have the following meanings:

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	<p>1. Freshet Period</p> <p>May 1 to July 31 inclusive.</p> <p>2. High Load Hours (HLH)</p> <p>High Load Hours (HLH) is the period of hours from 0600 to 2200, Monday to Saturday, except for Statutory Holidays (New Year's Day, Family Day, Good Friday, Victoria Day, Canada Day, B.C. Day, Labour Day, Thanksgiving Day, Remembrance Day and Christmas Day).</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 or Rate Schedule 1828 during all HLH of the current 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. Low Load Hours (LLH)</p> <p>Low Load Hours (LLH) are all hours other than HLH.</p>
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ACCEPTED: _____

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	<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> <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 or Rate Schedule 1828 during all LLH of the 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 or Rate Schedule 1828.</p>
<p>Reference Demand for Rate Schedule 1823 or Rate Schedule 1828</p>	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, for the purposes of determining Billing Demand under Rate Schedule 1823 or Rate Schedule 1828 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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<p>Reference Energy for Rate Schedule 1823 or Rate Schedule 1828</p>	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, the energy supplied to the Customer under Rate Schedule 1823 or Rate Schedule 1828 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 or Rate Schedule 1828 during each HLH and LLH of the current Freshet Period on the basis that energy consumption is equal to or less than the HLH Baseline and LLH Baseline in each hour, 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 or Rate Schedule 1828.</p>
<p>Rate Schedule 1892 Energy Determination</p>	<p>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 or Rate Schedule 1828.</p>
	<p>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.</p> <p>3. All other energy supplied to the Customer during the current Freshet Period will be deemed to have been supplied under Rate Schedule 1823 or Rate Schedule 1828.</p>

ACCEPTED: _____

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<p>Special Conditions</p>	<ol style="list-style-type: none"> 1. 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. By March 1 of each year in which the Customer wishes to take Electricity under this Rate Schedule, the Customer must: (i) notify BC Hydro of its elections to take Electricity under this Rate Schedule during the upcoming Freshet Period; (ii) 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 (iii) provide a description of the operational and/or production changes, as applicable, that the Customer plans to make at its plant to take advantage of this freshet energy program.
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ACCEPTED: _____

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	<p>3. Determination of HLH and LLH Baselines and Reference Demand for Customers that do not have 2015 Freshet Period Rate Schedule 1823 Electricity or who have been transferred to Rate Schedule 1828:</p> <ul style="list-style-type: none"> a. Customers will require at least one year of historical Rate Schedule 1823 or Rate Schedule 1828 Electricity usage to be eligible for baseline determination; and b. BC Hydro will use Rate Schedule 1823 Electricity during the most recent Freshet Period for HLH and LLH Baseline and Reference Demand determination; or c. Customers who have been transferred to service under Rate Schedule 1828 can apply for adjustments to their existing HLH and LLH Baseline and Reference Demand to reflect their expected Rate Schedule 1828 Electricity usage. Otherwise, BC Hydro will use Rate Schedule 1828 Electricity during the most recent Freshet Period for new HLH and LLH Baseline and Reference Demand determination. <p>4. If BC Hydro and the Customer agree that the HLH and LLH Baselines and Reference Demand calculated in accordance with the provisions above (i.e., using historical Electricity for the 2015 Freshet Period or most recent Freshet Period, as applicable) are not representative of the Customer’s expected Rate Schedule 1823 or Rate Schedule 1828 Electricity usage during the forthcoming Freshet Period and the parties agree to alternative HLH and LLH Baselines and Reference Demand, BC Hydro will file the agreed-to baselines and 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 or Rate Schedule 1828.</p>
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ACCEPTED: _____

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	<p>5. BC Hydro will also file with the BCUC any adjustments to the HLH and LLH Baselines and/or Reference Demand requested by customers and that are consistent with the principles and criteria set out in BC Hydro’s “Customer Baseline Load (CBL) Determination Guidelines” Electric Tariff Supplement No. 74. Subject to direction from the BCUC, BC Hydro will use such filed baselines and Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823 or Rate Schedule 1828, as applicable.</p> <p>6. Electricity under this Rate Schedule will not be available to a Customer if:</p> <p style="padding-left: 40px;">(a) The Customer has an electricity purchase agreement (EPA) with BC Hydro; and</p> <p style="padding-left: 40px;">(b) The Customer has, in accordance with the EPA, changed the Seasonal, Monthly or Hourly GBL(s) (as applicable and as defined in the EPA) applicable during the current Freshet Period for generator turndown and for which the customer is entitled to financial payment from BC Hydro under the EPA.</p> <p>7. 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>
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ACCEPTED: _____

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	<p>8. Change in Site Ownership</p> <p>If there is a change in site ownership during the current Freshet Period, supply under this Rate Schedule will be cancelled for the current Freshet Period. The new site owner may take Electricity under this Rate Schedule in a subsequent Freshet Period subject to the following provisions:</p> <p>(a) Where the new site owner expects to operate the site in the same way as the prior site owner, HLH and LLH Baselines and Reference Demand previously determined for the site and which have been approved by the Commission will be used for the site for any forthcoming Freshet Period.</p> <p>(b) Where the new site owner expects to operate the site differently from the prior site owner, such that the existing approved HLH and LLH Baselines and Reference Demand are no longer representative of expected Rate Schedule 1823 or Rate Schedule 1828 Electricity usage during the forthcoming Freshet Period, Special Condition 4 will apply to the determination of new HLH and LLH Baselines and Reference Demand.</p> <p>9. 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 cancelled for the current Freshet Period.</p> <p>10. If supply under this Rate Schedule is cancelled, all Electricity supplied to the Customer during the current Freshet Period will be deemed to be supplied under Rate Schedule 1823 or Rate Schedule 1828 and/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 1828 and/or Rate Schedule 1880, whichever is applicable, and BC Hydro will make any necessary retroactive billing adjustments.</p>
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ACCEPTED: _____

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	<p>11. Subject to any advance billing arrangement made under Electric Tariff Supplement Nos. 5 or 87, 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 or Rate Schedule 1828.</p> <p>12. 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).</p>
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, 6, 87 and 88.
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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5. TRANSMISSION SERVICE**RATE SCHEDULE 1892 – TRANSMISSION SERVICE – FRESHET ENERGY**

Availability	<p>For Customers supplied with Electricity under Rate Schedule 1823 (<u>Transmission Service - Stepped Rate</u>) <u>or Rate Schedule 1828 (Transmission Service – Biomass Energy Program)</u> that increase their Electricity usage during the Freshet Period, subject to the Special Conditions below.</p> <p><u>If a Customer is eligible to take service under this Rate Schedule and Rate Schedule 1893 (Incremental Energy Rate), the Customer may only take service under one of these Rate Schedules in any Billing Year, with the exception of the period ending March 31, 2021.</u></p>
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, 2019.
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"> 1. The greater of <ol style="list-style-type: none"> (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 2. A \$3/MWh wheeling rate <u>adder</u>.

ACCEPTED: _____

ORDER NO. _____

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Definitions	<p>Terms used in this Rate Schedule have the meanings given to them in Electric Tariff Supplement No. 5 or <u>87, and</u> Rate Schedule 1823 <u>or Rate Schedule 1828, as applicable, (Stepped Rate) unless otherwise defined.</u></p> <p>In addition, the following terms have the following meanings:</p> <ol style="list-style-type: none"> 1. Freshet Period May 1 to July 31 inclusive. 2. <u>High Load Hours (HLH)</u> The High Load Hours (HLH) hours ending is the period of hours from 07000600 to 2200, Monday through to Saturday, excluding North American Electric Reliability Corporation except for Statutory Holidays (New Year's Day, Family Day, Good Friday, Victoria Day, Canada Day, B.C. Day, Labour Day, Thanksgiving Day, Remembrance Day and Christmas Day) 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 <u>or Rate Schedule 1828</u> during all HLH of the 2015 <u>current</u> Freshet Period. 6. HLH Net to Gross Ratio The ratio obtained by dividing HLH Net Freshet Energy by HLH Gross Freshet Energy.
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ACCEPTED: _____

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	<p>7. <u>Low Load Hours (LLH)</u></p> <p>The hours ending 2300 to 0600, Monday through Saturday and all day Sunday and North American Electric Reliability Corporation holidays. Low Load Hours (LLH) period is defined as are all other hours other than HLH.</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>
	<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 <u>or Rate Schedule 1828</u> 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 <u>or Rate Schedule 1828</u>.</p>

ACCEPTED: _____

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<p>Reference Demand for Rate Schedule 1823 <u>or Rate Schedule 1828</u></p>	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, for the purposes of determining Billing Demand under Rate Schedule 1823 <u>or Rate Schedule 1828</u> 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.
<p>Reference Energy for Rate Schedule 1823 <u>or Rate Schedule 1828</u></p>	<p>If the Customer is supplied with Electricity under this Rate Schedule 1892, the energy supplied to the Customer under Rate Schedule 1823 <u>or Rate Schedule 1828</u> 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 <u>or Rate Schedule 1828</u> during each HLH and LLH of the current Freshet Period on the basis that energy consumption is equal to <u>or less than</u> the HLH Baseline and LLH Baseline <u>in each hour</u>, 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 <u>or Rate Schedule 1828</u>.</p>
<p>Rate Schedule 1892 Energy Determination</p>	<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 <u>or Rate Schedule 1828</u>.

ACCEPTED: _____

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	<p>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.</p> <p>3. All other energy supplied to the Customer during the current Freshet Period will be deemed to have been supplied under Rate Schedule 1823 <u>or Rate Schedule 1828</u>.</p>
<p>Special Conditions</p>	<p>1. Electricity is available under this Rate Schedule on a pilot program basis during the Freshet Periods of 2016, 2017, 2018 and 2019 only.</p> <p>1. 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 <u>or 88</u> to provide Service under this Rate Schedule.</p> <p>2. By March 1 of each year in which the Customer wishes to take Electricity under this Rate Schedule, the Customer must: <u>(i)</u> notify BC Hydro that the Customer of its <u>elections</u> to take Electricity under this Rate Schedule during the upcoming Freshet Period; and also <u>(ii)</u> 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 <u>(iii) provide</u> a description of the operational <u>and/or production</u> changes as applicable, that the Customer plans to make at its plant to take advantage of this freshet energy pilot program.</p>

ACCEPTED: _____

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3. Determination of HLH and LLH Baselines and Reference Demand for Customers that do not have 2015 Freshet Period Rate Schedule 1823 Electricity or who have been transferred to Rate Schedule 1828:
- a. Customers will require at least one year of historical Rate Schedule 1823 or Rate Schedule 1828 Electricity usage to be eligible for baseline determination; and
 - b. BC Hydro will use Rate Schedule 1823 Electricity during the most recent Freshet Period for HLH and LLH Baseline and Reference Demand determination; or
 - c. Customers who have been transferred to service under Rate Schedule 1828 can apply for adjustments to their existing HLH and LLH Baseline and Reference Demand to reflect their expected Rate Schedule 1828 Electricity usage. Otherwise, BC Hydro will use Rate Schedule 1828 Electricity during the most recent Freshet Period for new HLH and LLH Baseline and Reference Demand determination.
- 3.4. If BC Hydro and the Customer agree that the ~~LLH and~~ HLH and LLH Baselines ~~or and~~ Reference Demand calculated in accordance with the provisions above (i.e., using historical Electricity for the 2015 Freshet Period or most recent Freshet Period, as applicable) are not representative of the Customer's expected Rate Schedule 1823 or Rate Schedule 1828 Electricity usage during the forthcoming Freshet Period of 2016, 2017, 2018 or 2019, and the parties agree to alternative ~~LLH and~~ HLH and LLH Baselines ~~or and~~ Reference Demand, BC Hydro will file the agreed-to baselines ~~or and~~ 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 or Rate Schedule 1828.

ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – ~~Revision 5~~ Revision 6

Effective: ~~May 1, 2019~~ April 1, 2020

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	<p>4.5. <u>4.5.</u> <u>BC Hydro will also file with the BCUC any adjustments to the HLH and LLH Baselines and/or Reference Demand requested by customers and that are consistent with the principles and criteria set out in BC Hydro’s “Customer Baseline Load (CBL) Determination Guidelines” Electric Tariff Supplement No. 74.</u> Subject to direction from the BCUC, BC Hydro will use such filed baselines or and Reference Demand for the purposes of applying this Rate Schedule and Rate Schedule 1823 <u>or Rate Schedule 1828, as applicable.</u></p> <p>5.6. <u>5.6.</u> Electricity under this Rate Schedule will not be available to a Customer if:</p> <ul style="list-style-type: none"> (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(s) (as applicable and as defined in the EPA) applicable during the <u>current</u> Freshet Period <u>for generator turndown and for which the customer is entitled to financial payment from BC Hydro under the EPA of 2016, 2017, 2018 or 2019.</u> <p>6.7. <u>6.7.</u> 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>
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ACCEPTED: _____

ORDER NO. _____

COMMISSION SECRETARY

BC HydroRate Schedule 1892 – ~~Revision 5~~ Revision 6Effective: ~~May 1, 2019~~ April 1, 2020

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8. Change in Site Ownership

If there is a change in site ownership during the current Freshet Period, supply under this Rate Schedule will be cancelled for the current Freshet Period. The new site owner may take Electricity under this Rate Schedule in a subsequent Freshet Period subject to the following provisions:

(a) Where the new site owner expects to operate the site in the same way as the prior site owner, HLH and LLH Baselines and Reference Demand previously determined for the site and which have been approved by the Commission will be used for the site for any forthcoming Freshet Period.

(b) Where the new site owner expects to operate the site differently from the prior site owner, such that the existing approved HLH and LLH Baselines and Reference Demand are no longer representative of expected Rate Schedule 1823 or Rate Schedule 1828 Electricity usage during the forthcoming Freshet Period, Special Condition 4 will apply to the determination of new HLH and LLH Baselines and Reference Demand.

~~7.9.~~ 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.

~~8.10.~~ If supply under this Rate Schedule is cancelled ~~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 1828 and/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 1828 and/or Rate Schedule 1880, whichever is applicable, and BC Hydro will make any necessary retroactive billing adjustments.

ACCEPTED: _____

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BC Hydro

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Effective: ~~May 1, 2019~~ April 1, 2020

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	<p>9.11. Subject to any advance billing arrangement <u>made</u> under Electric Tariff <u>Supplement</u> Nos. <u>5</u> <u>or</u> <u>87</u>, 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 <u>or Rate Schedule 1828</u>.</p> <p>40.12. 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).</p>
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. <u>5</u> , <u>6</u> , <u>87</u> and 688 .
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

**Transmission Service Market Reference
Priced Rates Application**

Appendix C

Incremental Energy Rate Pilot RS 1893

BC Hydro

Rate Schedule 1893 – Original

Effective: January 1, 2020

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5. TRANSMISSION SERVICE**RATE SCHEDULE 1893 – TRANSMISSION SERVICE – INCREMENTAL ENERGY RATE**

Availability	<p>For Customers supplied with Electricity under Rate Schedule 1823 (Transmission Service – Stepped Rate) or Rate Schedule 1828 (Transmission Service – Biomass Energy Program), as applicable, that increase their Electricity usage during each Billing Period, subject to the Special Conditions below.</p> <p>If a Customer is eligible to take service under this Rate Schedule and Rate Schedule 1892 (Freshet Energy Rate), the Customer may only take service under one of these Rate Schedules in any Billing Year.</p>
Applicable in	Rate Zone I excluding the Districts of Kingsgate-Yahk and Lardeau-Shutty Bench.
Termination Date	This Rate Schedule will terminate effective March 31, 2024.
Rate	<p>Energy Charge:</p> <p>The charge applied to energy supplied under this Rate Schedule 1893 during each HLH and LLH in the Billing Period is equal to:</p> <ol style="list-style-type: none"> 1. The greater of: <ol style="list-style-type: none"> (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 2. An adder of \$3.00/MWh for the May, June and July Billing Periods and \$7.00/MWh for all other Billing Periods.

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Definitions

Terms used in this Rate Schedule have the meanings given to them in Electric Tariff Supplement No. 5 or 87 (as applicable) and Rate Schedule 1823 or Rate Schedule 1828 (as applicable), unless otherwise defined. In addition, the following terms have the following meanings:

1. Billing Period

Each Billing Period is a calendar month, beginning on the first day of that calendar month and ending on the last day of that calendar month.

2. High Load Hours (**HLH**)

HLH is the period from 06:00 to 22:00 Monday to Saturday, except for Statutory Holidays (New Year's Day, Family Day, Good Friday, Victoria Day, Canada Day, B.C. Day, Labour Day, Thanksgiving Day, Remembrance Day and Christmas Day).

3. HLH Baseline

The Customer's average hourly energy consumption under Rate Schedule 1823 or Rate Schedule 1828, as applicable, during HLH for each calendar month of the BC Hydro fiscal year commencing April 1, 2018 and ending March 31, 2019 (**Fiscal 2019**), or other period as determined in accordance with Special Condition 8 and/or 9. For greater certainty, the HLH Baseline will represent the historical electricity consumption in HLH for the calendar month divided by the total number of HLH in that month.

4. HLH Gross Incremental Energy

The hourly energy taken by the Customer during each HLH of the Billing Period in excess of the HLH Baseline, excluding all hours where the energy taken is less than the HLH Baseline.

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5. HLH Net Incremental Energy

The total energy taken by the Customer during all HLH of the Billing Period in excess of the total energy taken by the Customer under Rate Schedule 1823 or Rate Schedule 1828 (as applicable) during all HLH of the Billing Period.

6. Monthly HLH Net to Gross Ratio

The ratio obtained by dividing HLH Net Incremental Energy by the sum of HLH Gross Incremental Energy for each Billing Period.

7. Low Load Hours (LLH)

LLH are all hours other than HLH.

8. LLH Baseline

The Customer's average hourly energy consumption under Rate Schedule 1823 or Rate Schedule 1828 (as applicable) during LLH for each calendar month of the BC Hydro fiscal year commencing April 1, 2018 and ending March 31, 2019 (**Fiscal 2019**), or other period as determined in accordance with Special Condition 8 and/or 9. For greater certainty, the LLH Baseline for each calendar month will represent the historical electricity consumption in LLH for the calendar month divided by the total number of LLH in that month.

9. LLH Gross Incremental Energy

The hourly energy taken by the Customer during each LLH of the current Billing Period in excess of the LLH Baseline, excluding all hours where the energy taken is less than the LLH Baseline.

10. LLH Net Incremental Energy

The total energy taken by the Customer during all LLH of the current Billing Period in excess of the total energy taken by the Customer under Rate Schedule 1823 or Rate Schedule 1828 (as applicable) during all LLH of the Billing Period.

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	<p>11. Monthly LLH Net to Gross Ratio</p> <p>The ratio obtained by dividing LLH Net Incremental Energy by the sum of LLH Gross Incremental Energy for each Billing Period.</p> <p>12. Monthly Reference Demand</p> <p>The Monthly Reference Demand will be the actual Billing Demand (in kVA) during each Billing Period of Fiscal 2019, or other period as determined in accordance with Special Condition 8 and/or 9, and which is used to determine the Customer's HLH and LLH Baselines.</p>
<p>Highest kVA Demand for Rate Schedule 1823 or Rate Schedule 1828</p>	<p>If the Customer is supplied with Electricity under this Rate Schedule, for the purposes of determining Billing Demand under Rate Schedule 1823 or Rate Schedule 1828 (as applicable), the highest kVA Demand during the High Load Hours in each Billing Period will be equal to the lesser of:</p> <ol style="list-style-type: none"> 1. The Monthly Reference Demand; or 2. The actual highest kVA Demand during the High Load Hours in the Billing Period.
<p>Reference Energy for Rate Schedule 1823 or Rate Schedule 1828</p>	<p>If the Customer is supplied with Electricity under this Rate Schedule, the energy supplied to the Customer under Rate Schedule 1823 or Rate Schedule 1828 (as applicable) in each Billing Period will be the total energy supplied to the Customer less HLH and LLH Net Incremental Energy.</p>
<p>Rate Schedule 1893 Energy Determination</p>	<ol style="list-style-type: none"> 1. If HLH Net Incremental Energy is greater than zero, the HLH Gross Incremental Energy for each HLH hour of the Billing Period will be multiplied by the Monthly HLH Net to Gross Ratio. The product will be the amount of energy supplied during that HLH hour under this Rate Schedule. 2. If LLH Net Incremental Energy is greater than zero, the LLH Gross Incremental Energy for each LLH hour of the Billing Period will be multiplied by the Monthly LLH Net to Gross Ratio. The product will be the amount of energy supplied during that LLH hour under this Rate Schedule.

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BC Hydro

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	<p>3. All other energy supplied to the Customer during the current Billing Period will be energy supplied under Rate Schedule 1823 or Rate Schedule 1828 (as applicable).</p>
<p>Special Conditions</p>	<p>1. Electricity is available under this Rate Schedule on a pilot basis only until March 31, 2024.</p> <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 Nos. 6 or 88 to provide Service under this Rate Schedule.</p> <p>3. In order for a Customer to be eligible to take Electricity under this Rate Schedule:</p> <ul style="list-style-type: none"> (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 (b) The Customer must provide at least 30 days written notice to BC Hydro of its intention to take Electricity under this Rate Schedule as follows: <ul style="list-style-type: none"> (i) By March 1 for the upcoming Billing Year commencing April 1; or (ii) For the period prior to March 1, 2020, within 30 days of the effective date of this Rate Schedule; or (iii) Where a new RS 1823 Customer commences taking service during the Billing Year and still meets the eligibility criteria (such as by acquiring an existing site with the required consumption history), at least 30 days prior to the start of the next Billing Period; and

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	<p>(c) Any notice provided by a Customer under this subsection must include:</p> <ul style="list-style-type: none"> (i) An estimate of the amount of energy (in MWh) that the Customer expects to take under this Rate Schedule during each Billing Period; and (ii) A description of the operational and/or production changes, as applicable, that the Customer plans to make at its plant to take advantage of this pilot program. <p>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.</p> <p>5. If a Customer has self-generation, Electricity may be taken by that Customer under this Rate Schedule on an instantaneous basis when all or part of the Customer's electrical generating plant is curtailed.</p> <p>6. If a Customer taking service under this Rate Schedule also has an Electricity Purchase Agreement (EPA) with BC Hydro, no HLH and LLH Net Incremental Energy will be determined in any Billing Period if this energy is directly associated with an event of generator turndown, in accordance with and as defined in the EPA, for which the Customer is entitled to financial payment from BC Hydro under the EPA.</p>
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COMMISSION SECRETARY

BC Hydro

Rate Schedule 1893 – Original

Effective: January 1, 2020

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Customers will require at least two years of historical Electricity usage, to be eligible for baseline determination. Customers who have been transferred to service under Rate Schedule 1828 can apply for adjustments to their HLH and LLH Baseline and Reference Demand to reflect their expected Rate Schedule 1828 Electricity usage.

Where the customer does not have historical annual electricity consumption for Fiscal 2019, the most recent 12 Billing Periods will be used.

7. If BC Hydro and the Customer agree that the LLH and HLH Baselines and/or Monthly Reference Demand as defined above are not representative of the Customer's normal expected Rate Schedule 1823 or Rate Schedule 1828 Electricity usage, as applicable, during each Billing Period, and the parties agree to alternative LLH and HLH Baselines and/or Monthly Reference Demand, BC Hydro will file the agreed-to LLH and HLH Baselines and/or Monthly Reference Demand with the British Columbia Utilities Commission (**BCUC**) for approval. In cases where the Customer and BC Hydro cannot reach agreement, the BCUC will determine the final LLH and HLH Baselines and Monthly Reference Demand.
8. BC Hydro will file with the BCUC any adjustments to the HLH and LLH Baselines and/ or Monthly Reference Demands that are requested by customers and that BC Hydro has determined are consistent with the principles and criteria set out in BC Hydro's "Customer Baseline Load (**CBL**) Determination Guidelines" Electric Tariff Supplement No. 74.
9. Subject to direction from the BCUC, BC Hydro will use the LLH and HLH Baselines and Monthly Reference Demand filed in accordance with Special Condition 8 and/or 9 for the purposes of applying this Rate Schedule and Rate Schedule 1823 or Rate Schedule 1828, as applicable.

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BC Hydro

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Effective: January 1, 2020

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10. If an RS 1823 customer's highest kVA Demand in HLH of a Billing Period is greater than the Monthly Reference Demand applicable to that Billing Period multiplied by 2.0, then: (i) the Monthly Reference Demand for that Billing Period will be automatically adjusted to be equal to 50% of the highest kVA Demand in HLH during that Billing Period; and (ii) the HLH and LLH Baselines for that Billing Period will be automatically adjusted to be equal to 50% of the total energy volumes taken by the customer in the HLH and LLH of that Billing Period. For RS 1823 customers, the adjustments to the Monthly Reference Demand and the HLH and LLH Baselines made pursuant to this Special Condition will be effective as of the start of the Billing Period in which the excess electricity was used. The adjusted Monthly Reference Demand and the adjusted HLH and LLH Baselines will remain in effect for that calendar month in future years of the RS 1893 pilot.
11. A Customer taking Electricity under this Rate Schedule may, by providing written notice to BC Hydro at any time, cancel supply under this Rate Schedule. In all cases of cancellation, BC Hydro will terminate RS 1893 service for the entire Billing Period in which the cancellation occurs. If supply under RS 1893 is cancelled, all electricity supplied will be billed under RS 1823 or RS 1828 and/or RS 1880, as applicable. BC Hydro will not rebill for any Electricity supplied under RS 1893 in a prior Billing Period. A Customer who cancels RS 1893 service will not be eligible to return to RS 1893 service during the Billing Year, but remains eligible to re-enrol for service under this Rate Schedule for any future Billing Year as long as all other eligibility requirements are met.
12. If a Customer with self-generation taking Electricity under this Rate Schedule requests service under Rate Schedule 1880 (Standby and Maintenance Supply) during any current Billing Period, Electricity supply under this Rate Schedule will be automatically cancelled for the remainder of the Billing Year. The date the Customer's RS 1880 service request is validated by BC Hydro will be the effective date of cancellation.

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BC Hydro

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Effective: January 1, 2020

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	13. 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 U.S. 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, as applicable.
Note	The terms and conditions under which Transmission Service is supplied are contained in Electric Tariff Supplement Nos. 5 and 6 or Electric Tariff Supplement Nos. 87 and 88 as applicable.
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

**Transmission Service Market Reference
Priced Rates Application**

Appendix D

**BC Hydro Compliance with BCUC Order
Nos. G-17-16 and G-45-18
Freshet Rate Pilot Final Evaluation report –
December 17, 2018**



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

December 17, 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)
Freshet Rate Pilot Final Evaluation Report
Compliance with Commission Order Nos. G-17-16 and G-45-18**

BC Hydro writes to submit its Freshet Rate Pilot Final Evaluation Report in compliance with Commission Order Nos. G-17-16 and G-45-18. Directive 4 of Order No. G-45-18 required BC Hydro to submit its final evaluation report of the Freshet Rate Pilot, including Year 3 results, in fall 2018.

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

Yours sincerely,

A handwritten signature in black ink, appearing to read "Fred James", written over a light blue horizontal line.

Fred James
Chief Regulatory Officer

ac/ma/

Enclosure (1)

...2/

December 17, 2018
 Mr. Patrick Wruck
 Commission Secretary and Manager
 Regulatory Support
 British Columbia Utilities Commission
 Compliance with Commission Order Nos. G-17-16 and G-45-18



Page 2 of 2

<p>Copy to: Association of Major Power Customers Attention: Mathew Keen matthew.keen@nortonrosefulbright.com</p> <p>British Columbia Ministry of Energy and Mines Attention: Scott Cutler Scott.Cutler@gov.bc.ca</p> <p>Commercial Energy Consumers' Association of British Columbia Attention: Christopher Weafer cweafer@owenbird.com</p> <p>Attention: David Craig dwcraig@allstream.net</p> <p>Movement of United Professionals Attention: Jim Quail jquail@aqwlaw.ca</p>	<p>BC Sustainable Energy Association and Sierra Club Attention: William J. Andrews wjandrews@shaw.ca</p> <p>Catalyst Paper Corp. Attention: Carlo Dal Monte Carlo.DalMonte@catalystpaper.com</p> <p>Erco Worldwide Attention: Mike Filippelli mfilippelli@ercoworldwide.com</p> <p>Non-Integrated Areas Ratepayers Group Attention: Fred Weisberg fredweislaw@gmail.com</p>	<p>BC Old Age Pensioners' Organization Attention: Leigha Worth lworth@bcpiac.com</p> <p>Clean Energy Association of BC Attention: David Austin daustin@cwilson.com</p> <p>FortisBC Energy Inc. Attention: David Pertulla david.pertulla@fortisbc.com</p> <p>West Fraser Mills Ltd. Attention: Rod Albers rod.albers@westfraser.com</p>
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**Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18**

Freshet Rate Pilot Final Evaluation Report

December 2018

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Attachments

- Attachment 1 Preliminary Freshet Rate Evaluation Reports for Year 1
- Attachment 2 Preliminary Freshet Rate Evaluation Reports for Year 2
- Attachment 3 Customer Survey Questions and Customer Feedback Form

1 **Executive Summary**

2 BC Hydro's Rate Schedule 1892 – Transmission Service – Freshet Energy (**Freshet**
3 **Rate or Rate Schedule (RS) 1892**) was approved on February 9, 2016 by
4 Commission Order No. G-17-16 for a two-year pilot (**Freshet Pilot** or **Pilot**). This
5 Order also directed BC Hydro to file three evaluation reports using the evaluation
6 criteria and the agreed to reporting items as proposed by BC Hydro in the 2015 Rate
7 Design Application (**2015 RDA**). BC Hydro was also directed to address additional
8 items as part of the evaluation process. By Order No. G-45-18, the British Columbia
9 Utilities Commission (**Commission** or **BCUC**) approved BC Hydro's request to
10 extend the Freshet Rate Pilot for a third year until December 31, 2018 and directed
11 BC Hydro to file this final evaluation report by fall 2018.

12 BC Hydro is filing this Freshet Rate Pilot Final Evaluation Report in compliance with
13 Directives 3, 4, 5 and 6 of Commission Order No. G-17-16 and Directive 4 of
14 Commission Order No. G-45-18.

15 **1.1 Pilot Objectives**

16 The Freshet Rate was proposed to assist in the management of a seasonal energy
17 surplus during the freshet period of May through July by encouraging industrial
18 customers to use more electricity. BC Hydro's system energy surplus arises during
19 freshet from high system inflows¹ combined with an increase in must-take generation
20 from Independent Power Producers and low domestic loads. The Freshet Rate helps
21 to mitigate this unique system condition by providing BC Hydro with options to:

- 22 • Increase the ability to import market electricity during low-priced periods;
- 23 • Reduce the volume of surplus energy forced to export markets; and/or

¹ Approximately one half of the total annual system inflow volumes occur in the freshet.

- 1 • Reduce spill risk at BC Hydro facilities.

2 The Freshet Rate was also responsive to the 2013 Industrial Electricity Policy
3 Review (**IEPR**) task force recommendations² to develop innovative rate options for
4 industrial customers and to recover what BC Hydro would otherwise obtain on the
5 export market, but with potential economic benefits to BC.

6 **1.2 Overview of Pilot Results**

7 BC Hydro considers that the Freshet Rate was successful over all three years of the
8 Pilot in achieving the objectives set out in section [1.1](#). Key success metrics are:
9 (1) customer take-up/participation; (2) incremental energy sales and revenue; and
10 (3) positive ratepayer impact. Each of these success metrics are discussed below. In
11 summary, the Pilot:

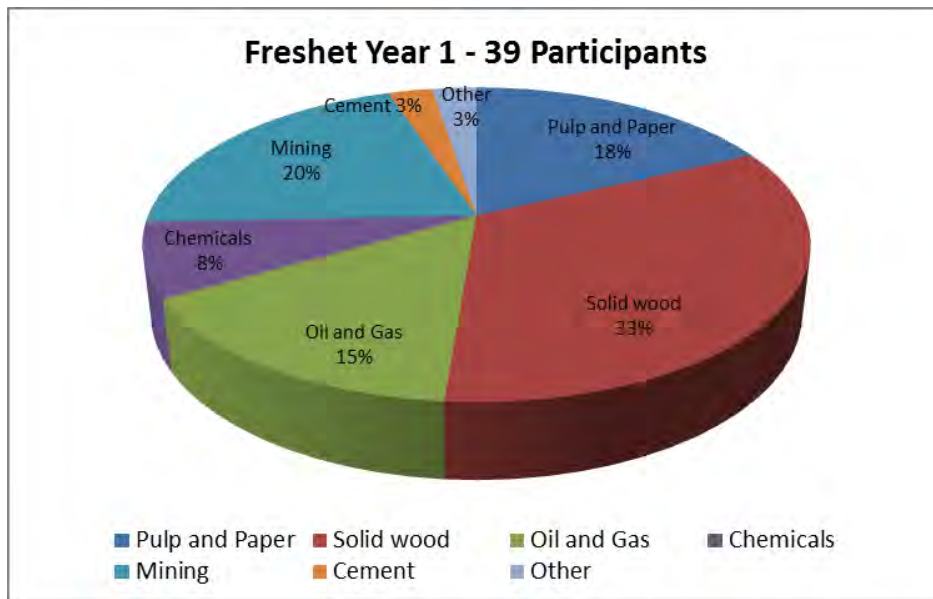
- 12 (i) drove participation from approximately 30 per cent of eligible customers in the
13 transmission service class;
- 14 (ii) increased domestic energy sales by 458 GWh and revenue by \$11.8 million
15 from participant customers; and
- 16 (iii) had an estimated positive ratepayer impact of \$3.7 million after adjustment for
17 all verified costs.

² Recommendation 13 of the IEPR task force final report stated “BC Hydro should work with its industrial customers and the Commission to develop options that take advantage of industrial power consumption flexibility”.

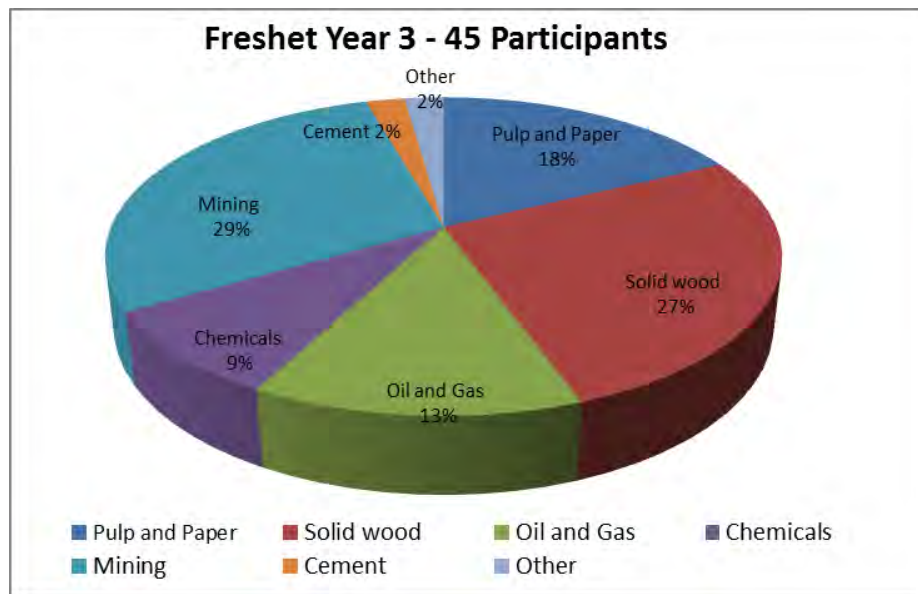
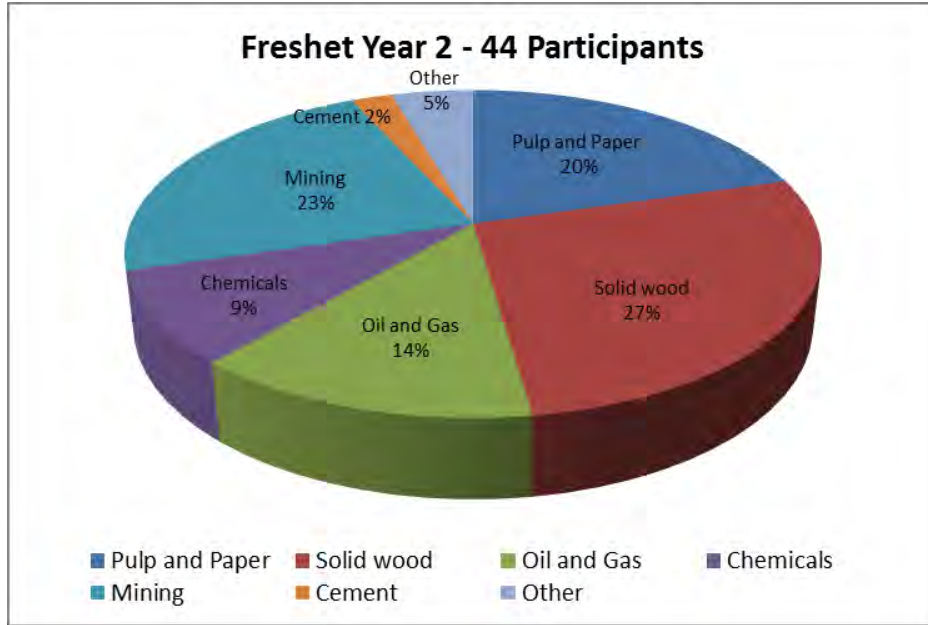
1.3 Success Metric #1: Customer Take-up/Participation

The rate had exceptional customer participation from a broad cross-section of industry. Refer to [Figure 1](#) below. There were 39 participant customer sites in Year 1, 44 participants in Year 2 and 45 participants in Year 3.³ This level of participation represents approximately 30 per cent of eligible sites across the entire pool of eligible RS 1823 transmission service customers (total 140 sites).

Figure 1 Customer Site Participants by Industry Sector



³ BC Hydro’s initial estimate of participation in its 2015 Application was three to five customers.



1.4 Success Metric #2: Incremental Energy Sales and Revenue

The rate resulted in incremental energy sales and revenue during each year of the Pilot. Refer to [Table 1](#) below. Total RS 1892 energy sales were 139 GWh (Year 1), 168 GWh (Year 2) and 150 GWh (Year 3). Over the three years of the Pilot, total RS 1892 energy sales were 458 GWh and total RS 1892 revenue was \$11.8 million. This exceeds BC Hydro’s initial estimate of incremental energy consumption in its 2015 RDA Application of 11 to 66 GWh/year.⁴

Table 1 Summary of Results by Year for the Freshet Rate Pilot

RS 1892 SUMMARY OF RESULTS	YEAR 1	YEAR 2	YEAR 3	Total	
	May - July 2016	May - July 2017	May - July 2018		
Total # of Participant Customer Sites	39	44	45		
# of Participant Customer Sites with RS 1892 energy	26	32	27		
RS 1892 energy sales (MWh)	139,064	168,400	150,383	457,847	
Average incremental load (Ave. MW/hr)	63	76	68		
Average unit cost of market-priced energy (C\$/MWh)	\$ 21.88	\$ 19.50	\$ 23.31		
RS 1892 energy revenue (\$M)	\$ 3.04	\$ 3.28	\$ 3.51		
Plus C\$3/MWh wheeling fee on energy volume (\$M)	\$ 0.42	\$ 0.51	\$ 0.45	\$ 1.37	
Plus 5% rate rider (\$M)	\$ 0.17	\$ 0.19	\$ 0.20		
Total RS1892 energy sales (excluding taxes)	\$ 3.63	\$ 3.98	\$ 4.15	\$ 11.77	

1.5 Success Metric #3: Positive Ratepayer Benefit

A core design objective of the Freshet Rate was that all ratepayers should be held harmless. BC Hydro confirms that this objective was achieved. The rate resulted in benefits to both participant and non-participant ratepayers in each year of the Pilot.

1.5.1 Benefit to Participants

Benefits to participants arise when the average unit price for RS 1892 electricity is lower than the average unit price for RS 1823 electricity. This lower price provides

⁴ BC Hydro reported expected take-up of 5 to 30 MW of average incremental energy over the freshet period during a stakeholder workshop (refer to TSR Workshop No. 2, May 7, 2015 contained in Appendix C-5B, page 38 of 212, of the 2015 RDA). BC Hydro provided the corresponding gigawatt hour range of 11 to 66 GWh over the freshet period (please refer to 2015 RDA Transcript Volume 2, page 221, lines 4 to 10). The link for the transcript is: https://www.bccuc.com/Documents/Transcripts/2016/DOC_45557_01-25-2016_BCH-Transcript-SRP-Vol2.pdf.

1 an incentive for participant customers to purchase incremental electricity thereby
 2 reducing their overall average unit cost of electricity. BC Hydro provides an
 3 illustrative estimate of the total electricity cost reduction for participant customers of
 4 approximately \$9.3 million in [Table 2](#) below.

5 For this illustrative estimate, BC Hydro used the difference between the average
 6 RS 1892 unit energy price and the RS 1823 Tier 1 unit energy price to estimate the
 7 average unit cost reduction for incremental energy sales. Actual results will differ on
 8 a customer-by-customer basis.⁵ This analysis does not consider customer-specific
 9 benefits arising from the production and sale of incremental product as BC Hydro
 10 considers this information to be commercially sensitive and confidential.

11 **Table 2 Illustrative Benefit for Participant**
 12 **Customers**

Estimate of unit and total electricity cost reduction	Year 1 F2017	Year 2 F2018	Year 3 F2019	Total
Energy - estimated unit cost reduction				
Average RS 1892 energy charge (includes \$3/MWh wheeling)	\$ 24.88	\$ 22.50	\$ 26.31	
RS 1823 Tier 1 energy charge	\$ 39.81	\$ 41.20	\$ 42.44	
Electricity price reduction vs RS 1823 Tier 1 \$/MWh	\$ 14.93	\$ 18.70	\$ 16.13	
Total RS 1823 energy volume (MWh)	139,064	168,400	150,383	
Estimated energy cost reduction	\$ 2,076,138	\$ 3,148,608	\$ 2,425,430	\$ 7,650,175
Demand - estimated unit cost reduction				
Total RS 1892 energy sales (MWh)	139,064	168,400	150,383	
Total number of hours during Freshet Period (hrs)	2,208	2,208	2,208	
Average incremental demand at unity power factor (kVA)	62,982	76,268	68,108	
RS 1823 demand charge (\$/kVA)	7.634	7.901	8.138	
Estimated demand cost reduction	\$ 480,804	\$ 602,594	\$ 554,265	\$ 1,637,663
Total estimated electricity cost reduction*	\$ 2,556,942	\$ 3,751,202	\$ 2,979,694	\$ 9,287,838
<i>* excludes rate rider and taxes</i>				

⁵ Participant customers might otherwise see an RS 1823 Tier 2 energy price or RS 1880 energy price for incremental load, depending on their unique circumstances.

1.5.2 Benefit to Non-Participants

The benefit to non-participants is based on an economic analysis performed by BC Hydro of daily system operations during the Freshet Period. The analysis considers, on a daily time-step basis, whether BC Hydro gained or lost revenue by selling incremental energy to domestic customers under RS 1892 rather than marketing this energy. It considers the marginal resource used to serve RS 1892 energy volumes during each day of the Freshet Period in both Heavy Load Hours (HLH) (on-peak hours)⁶ and Light Load Hours (LLH) (off-peak hours). BC Hydro's preliminary (unadjusted) estimate of ratepayer benefit is \$6.3 million.

BC Hydro has further adjusted this estimate to remove the impact of additional verified costs which it considers to reduce ratepayer benefits. These costs include: (1) implementation costs; and (2) verified load shifting costs. BC Hydro has expanded its definition of load shifting to include customer-reported events of load-shifting, unexplained load variances, natural load growth and use of RS 1892 as a replacement service for RS 1880 during events of forced generator outage.

BC Hydro's adjusted estimate of ratepayer benefit for the Pilot is \$3.7 million⁷ as shown in [Table 3](#) below. BC Hydro considers this adjusted value to reflect a positive net benefit to ratepayers.

⁶ On-peak hours are 6 a.m. to 10 p.m. Monday through Saturday, excluding Sundays and statutory holidays. Off-peak hours are all other hours.

⁷ Detailed analysis of load shifting for Year 3 has not been performed. However, on a preliminary basis, BC Hydro's forecast of the Year 3 load shifting impact is (\$500k). This forecast is lower than Year 1 and Year 2 actuals because no events of forced generator outage occurred in Year 3. Refer to section [3.1.7](#) for more detail.

1 **Table 3 Adjusted Ratepayer Benefit by Pilot Year**

Ratepayer Benefit - Adjustment Description	Year 1 (\$,000)	Year 2 (\$,000)	Year 3 (\$,000)	Total (\$,000)
Preliminary ratepayer benefit	\$ 2,259	\$ 2,194	\$ 1,872	\$ 6,325
Less implementation costs	\$ (115)	\$ (30)	\$ (60)	\$ (205)
Less customer-reported load shift impact	\$ (32)	\$ -	\$ (50)	\$ (82)
Less unexplained load variance impact	\$ -	\$ -	\$ -	\$ -
Less natural load growth impact	\$ (470)	\$ (340)	\$ (450)	\$ (1,260)
Less RS 1880 replacement service impact	\$ (233)	\$ (820)	\$ -	\$ (1,053)
Adjusted Ratepayer Benefit	\$ 1,409	\$ 1,004	\$ 1,312	\$ 3,725
<i>*actuals for Year 1 and Year 2; forecast for Year 3</i>				

2 **1.6 Recommendations**

3 **Recommendation 1: BC Hydro should continue to offer the Freshet Rate**

4 BC Hydro considers that the Pilot has demonstrated ‘proof of concept’ for the
 5 Freshet Rate. There was excellent participation from a diverse cross-section of
 6 industry. The rate provided financial benefits to both participants and non-
 7 participants. Feedback from customer and stakeholder workshops provides strong
 8 evidence of support for BC Hydro continuing to offer the Freshet Rate. Support was
 9 provided even where a customer might not have the ability to participate. Simply put,
 10 the rate works and so it should continue. BC Hydro intends to apply to the
 11 Commission to continue to offer the Freshet Rate in future.

12 **Recommendation 2: The existing Freshet Rate design is effective**

13 The Freshet Rate design was effective in providing customers with a lower cost
 14 option for incremental use. The existing design minimized load shifting. There were
 15 no identified issues with baseline determination, implementation and billing.
 16 BC Hydro did receive participant customer feedback which targeted two specific
 17 aspects of the rate design: (1) seasonal billing methodology; and (2) timing of the
 18 freshet period. Customer feedback suggested moving to monthly billing settlement
 19 (rather than seasonal) and for the freshet period to either be expanded to include

1 April, or modified to replace July with April. BC Hydro considers that seasonal billing
2 reduces administrative burden and potential for load shifting, relative to monthly
3 billing, and that BC Hydro's system operations support maintaining the existing
4 freshet period definition of May through July.

5 **Recommendation 3: Expand the freshet rate concept to the entire year**

6 Freshet Rate participants have indicated their support for a similar rate to be offered
7 over a full year. Given the success of the Freshet Rate, BC Hydro is examining a
8 potential new optional rate that would be available over the full year. Similar to the
9 Freshet Rate, the potential new optional rate would be for non-firm, interruptible
10 service using market reference-priced energy (Mid-C) to encourage incremental
11 domestic electricity use from RS 1823 customers.

2 Evaluation Scope and Report Structure

Commission Order No. G-17-16 directed BC Hydro to file the three evaluation reports as described in section 7.3.4.6 of the 2015 RDA. These three reports are described in [Table 4](#) below which is copied from the 2015 RDA (page 7 to 44). The table also includes when the reports are to be submitted to the Commission.

On December 8, 2017, BC Hydro applied to extend the Freshet Rate Pilot to include a third year and also proposed to extend the timeline for filing the final evaluation report from spring 2018 to fall 2018. By Order No. G-45-18, the Commission approved an extension to fall 2018 for filing of the final evaluation report which includes an evaluation of Year 3.

BC Hydro filed its first evaluation report (Report A - Year 1) on December 8, 2016.⁸ The second evaluation report (Report B – Year 2) was filed on December 5, 2017.⁹ This final evaluation report (Report C) which includes Year 3 results was filed on December 17, 2018, which meets the fall 2018 timeline.

Table 4 2015 RDA Evaluation Reports

Report	RDA Proposal
Preliminary evaluation report	Report A: <ul style="list-style-type: none"> • Fall 2016 – Report take-up of the pilot in Year 1 and identify total sales and revenue under the rate. Report B: <ul style="list-style-type: none"> • Fall 2017 – Report take-up of the pilot in Year 2 and identify total sales and revenue under the rate. Report the impact of shifting in Year 1, which BC Hydro can only do at the end of F2017.
Final evaluation report	Report C: <ul style="list-style-type: none"> • Spring 2018 – summary of take-up and shifting over the two-year pilot program.

The concordance table shown in [Table 5](#) below identifies the specific section where each of the evaluation criteria as set forth in Order No. G-17-16 and section 7.3.4.6

⁸ Appendix D “BC Hydro System Conditions during Freshet and Associated Management Strategies” of the report was filed with the Commission on January 27, 2017. The Preliminary Freshet Rate Evaluation Report for Year 1 is included in Attachment 1.

⁹ The Preliminary Freshet Rate Evaluation Report for Year 2 is included in Attachment 2.

1 of the 2015 RDA has been addressed. The balance of this report is organized into
2 three sections as set out below:

- 3 • Section [3](#): Pilot Evaluation Criteria;
- 4 • Section [4](#): Customer and Stakeholder Engagement; and
- 5 • Section [5](#): Year 3 Results and Year 2 load shifting analysis.

6 **Table 5 Evaluation Criteria Concordance**

Evaluation Criteria	Section
Directive 4 of Commission Order No. G-17-16	
a) Analysis of the costs/benefits to non-participating customers, including the \$0kWh floor price, and evaluating the appropriateness of sharing additional benefits with non-participating customers;	3.1.1
b) The freshet rate pilot wheeling charges as compared to those that would have been collected had FortisBC Inc.'s standby rate charges been applied;	3.1.2
c) The data, the calculations, the analysis and other considerations, if any, that went to determining each customer's baseline, each customer's freshet rate charges and each customer's RS 1823 charges;	3.1.3
d) Freshet rate engagement activities with commercial ratepayers and other ratepayer groups;	3.1.4
e) Detailed information as to the extent of the potential energy oversupply issue and BC Hydro's progress on other strategies it is pursuing to mitigate the issue;	3.1.5
f) All costs associated with the implementing the freshet rate pilot; and	3.1.6
g) An analysis of the impact of any load shifting including the actual monthly consumption for each pilot participant in comparison to the respective CBLs for each.	3.1.7
Directive 5 of Commission Order No. G-17-16 <i>prior to filing the final evaluation report on the freshet rate pilot, BC Hydro is to consult with stakeholders on further process in the event there is a recommendation that the freshet pilot rate be made permanent.</i>	3.2.1
Directive 6 of Commission Order No. G-17-16	
6. BC Hydro is directed to provide more clarity in its evaluations and provide more clarity as to the magnitude of the energy surplus during freshet and provide an estimate of its potential value.	3.3.1
2015 RDA, section 7.3.4.6	
1. Did the rate provide RS 1823 customers with lower cost options?	3.4.1
2. Did the rate have positive or negative impacts on non-participating customers?	3.4.2
3. How many RS 1823 customers used the rate? What were the volumes of use?	3.4.3
4. How did customers use the rate?	3.4.4
5. To what extent did shifting contribute to higher freshet energy?	3.4.5
6. Was there any shifting within the freshet period from HLH to LLH?; and	3.4.6
7. Were there any issues with setting baselines, implementation, or billing?	3.4.7
8. Did the pilot impact customer's conservation and efficiency measures?	3.4.8
9. How quickly did customers respond to changes in market prices?	3.4.9
10. Did customers with aggregated RS 1823 loads shift consumption between plants to take advantage	3.4.10

Evaluation Criteria	Section
of this rate?	
11. 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?	3.4.11
12. Was there any impact on RS 1880 events? Did customers use the rate as a substitute for RS 1880?	3.4.12

3 Pilot Evaluation Criteria

3.1 Directive 4 of Commission Order No. G-17-16

3.1.1 Analysis of Costs/Benefits to Ratepayers

The Freshet Rate had a positive benefit on both participant and non-participant ratepayers in each Year of the Pilot.

3.1.1.1 Benefit to Participants

In each year of the Pilot, the average unit price for RS 1892 electricity was lower than the average unit price for RS 1823 electricity. This provided an incentive for participant customers to increase electricity use at lower average unit cost. For example, one participant customer states:

“... due to the competitive Mid-C prices during each year of the Pilot, we were able to reduce the all-in cost of incremental energy and produce an extra 6,000 metric tonnes/yr of product that we otherwise would not have produced.”

The rate benefit to participating customers was approximated by comparing the average unit cost for RS 1892 electricity (which was lower) with the average unit cost for RS 1823 electricity (which was higher) for the volume of incremental RS 1892 energy sales. The electricity cost reduction was calculated as follows:

- Energy: the energy cost reduction was calculated by multiplying the difference between the average RS 1892 unit energy price and RS 1823 Tier 1 unit energy charge¹⁰ by incremental energy volumes.
- Demand: the demand cost reduction was calculated by multiplying the RS 1823 kVA demand charge by average incremental load. BC Hydro used the average incremental load increase (in kW) for all participants in aggregate and assumed this aggregate load increase occurred in HLH at unity power factor

¹⁰ RS 1823 Tier 1 energy charge is used for simplicity. Actual results will differ on a customer-by-customer basis.

1 (i.e., 1 kW = 1 kVA). For example, the average load increase in Year 3 is
2 calculated as: 150,383 MWh/2,208 hrs = 60.1 MW = 60.1 MVA = 60,100 kVA.

3 [Table 6](#) below shows the average cost of RS 1892 energy as compared to RS 1823
4 energy charges. The average RS 1892 energy charge for each year (in \$/MWh) is
5 calculated based on total RS 1892 revenue before rate rider and taxes divided by
6 the total volume of RS 1892 energy purchases. As such, the calculation uses
7 aggregate RS 1892 revenue, which is the sum of revenue paid by each individual
8 customer based on market pricing and aggregate net RS 1892 HLH and LLH energy
9 purchases.¹¹ The fixed \$3.00/MWh wheeling rate is then applied. The RS 1892
10 energy price differential relative to RS 1823 Tier 1 is derived from this comparison
11 (line 6 below).

12 **Table 6 Comparison of RS 1892, RS 1823 and**
13 **RS 1880 Energy Charges**

line	Average Energy Charges by Rate Schedule	Year 1	Year 2	Year 3
		F2017	F2018	F2019
		C\$/MWh	C\$/MWh	C\$/MWh
1	Aggregate average RS 1892 energy charge	\$ 24.88	\$ 22.50	\$ 26.31
2	RS 1823 Tier 1 energy charge	\$ 39.81	\$ 41.20	\$ 42.44
3	RS 1823 Tier 2 energy charge	\$ 89.20	\$ 92.32	\$ 95.09
4	RS 1823 Energy Charge A	\$ 44.75	\$ 46.31	\$ 47.70
5	RS 1880 Energy Charge	\$ 89.20	\$ 92.32	\$ 95.09
6	Energy price differential vs RS 1823 Tier 1	\$ 14.93	\$ 18.70	\$ 16.13
7	Energy price differential vs RS 1823A	\$ 19.87	\$ 23.81	\$ 21.39
8	Energy price differential vs RS Tier 2 and 1880	\$ 64.32	\$ 69.82	\$ 68.78

14 [Table 7](#) below shows BC Hydro’s estimate of total participant customer electricity
15 cost reduction (energy and demand) for each year of the Pilot. The total estimated
16 electricity cost reduction for the Pilot is \$2.6 million in Year 1, \$3.8 million in Year 2
17 and \$2.9 million in Year 3, for a total of \$9.2 million. Approximately 82 per cent of the

¹¹ The actual price of RS 1892 energy paid by each specific customer was higher or lower than this aggregate average to reflect their unique daily mix of HLH and LLH Net Freshet Energy over the season.

1 cost reduction arises from the lower price for incremental energy sales and
 2 18 per cent of the cost reduction arises from the avoided kVA demand charge for
 3 non-firm service. BC Hydro considers this to be a conservative estimate of
 4 participant customer cost reduction as some customers would have seen a price
 5 higher than RS 1823 Tier 1 for incremental energy purchases. Further, actual kVA
 6 demand peaks during HLH for individual customers may have been higher than the
 7 aggregated average.

8 **Table 7 Estimated Participant Customer Benefit**

Estimate of unit and total electricity cost reduction	Year 1 F2017	Year 2 F2018	Year 3 F2019	Total
Energy - estimated unit cost reduction				
Average RS 1892 energy charge (includes \$3/MWh wheeling)	\$ 24.88	\$ 22.50	\$ 26.31	
RS 1823 Tier 1 energy charge	\$ 39.81	\$ 41.20	\$ 42.44	
Electricity price reduction vs RS 1823 Tier 1 \$/MWh	\$ 14.93	\$ 18.70	\$ 16.13	
Total RS 1823 energy volume (MWh)	139,064	168,400	150,383	
Estimated energy cost reduction	\$ 2,076,138	\$ 3,148,608	\$ 2,425,430	\$ 7,650,175
Demand - estimated unit cost reduction				
Total RS 1892 energy sales (MWh)	139,064	168,400	150,383	
Total number of hours during Freshet Period (hrs)	2,208	2,208	2,208	
Average incremental demand at unity power factor (kVA)	62,982	76,268	68,108	
RS 1823 demand charge (\$/kVA)	7.634	7.901	8.138	
Estimated demand cost reduction	\$ 480,804	\$ 602,594	\$ 554,265	\$ 1,637,663
Total estimated electricity cost reduction*	\$ 2,556,942	\$ 3,751,202	\$ 2,979,694	\$ 9,287,838
<i>* excludes rate rider and taxes</i>				

9 **3.1.1.2 Benefit to Non-participants**

10 The estimated benefit to non-participant ratepayers is based on an economic
 11 analysis performed by BC Hydro. Daily power supply operations were examined to
 12 determine the marginal resource used to serve incremental RS 1892 energy
 13 volumes during each day of the Pilot, in both HLH (on-peak hours) and LLH
 14 (off-peak hours). The marginal resource used to serve RS 1892 energy on any given

1 day reflects one of the three conditions described below. BC Hydro ratepayers are
2 typically better off under Conditions 1 and 3 and worse off under Condition 2.¹²

3 **Condition 1: Minimum Generation with Exports**

4 When BC Hydro is experiencing a minimum generation constraint,¹³ and there are
5 net exports, incremental domestic sales under RS 1892 will reduce exports. Holding
6 market price constant, BC Hydro will see a revenue increase equal to the difference
7 between the CAD \$3/MWh wheeling rate and 5 per cent rate rider collected under
8 RS 1892 and the avoided US \$5.16/MWh wheeling charge¹⁴ paid for energy delivery
9 from the BC border to the Mid-C market (converted to Canadian dollars daily) plus
10 1.9 per cent transmission losses.

11 **Condition 2: Minimum Generation with Imports**

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

¹² All references to market exports and imports refer to the actions of BC Hydro's wholly-owned subsidiary, Powerex, which is BC Hydro's exclusive agent for the marketing and trade of electricity.

¹³ Appendix D to the Year 1 evaluation report defines system minimum generation (page 5 of 20). "Must-take energy" is energy that cannot be stored at the generating facility for later use. "System minimum generation" is where the system is operating exclusively on must-take energy.

¹⁴ The US\$5.16/MWh wheeling charge is calculated by adding the Non-Firm Point to Point hourly rate of US\$4.23/MWh (Schedule PTP-18) plus the Scheduling, System control and Dispatch Service short-term hourly rate of US\$0.93/MWh. Please refer to Bonneville Power Authority Transmission Rates effective October 1, 2017. A summary of these rates can be found at the following link:
<https://www.bpa.gov/Finance/RateInformation/RatesInfoTransmission/FY18-19/2018%20Rate%20Schedule%20Summary.pdf>.

1 **Condition 3: Higher Basin Generation on the Margin**

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

16 [Table 8](#) below shows the ratepayer benefit (cost) that was calculated for each
17 system condition, by month, during each Year of the Pilot.

1
2

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

3 **3.1.1.3 Adjusted Benefit to Non-participants**

4 BC Hydro has further adjusted this initial estimate of benefits to remove the impact
5 of additional costs which include:

- 6 • **Implementation Costs:** Incremental costs related to billing, customer and
7 stakeholder engagement, regulatory proceedings (these include the costs of
8 the 2016 freshet rate proceeding workshop, Participant Assistance Cost
9 Awards for intervener participation and costs related to BC Hydro retaining
10 external legal services) and to cover some of the costs of preparation of
11 evaluation reports (e.g., additional data collection and analysis). All other staff

1 and administration costs were funded under existing operating budgets using
2 existing staff. Please refer to section [3.1.6](#) for additional detail.

- 3 • **Verified Annual Load Shifting Impact:** The load shifting adjustment
4 incorporates the revenue reduction that arises when a participant customer
5 shifts load from a non-freshet month (under RS 1823) to a freshet month (under
6 RS 1892) with no net change in annual energy consumption. Load shift energy
7 also includes energy that BC Hydro considers the customer would have
8 purchased anyway, such as for natural load growth and verified use of RS 1892
9 as a replacement service for RS 1880. For verified load-shift energy, the impact
10 is calculated as the difference between the revenue collected under RS 1892
11 and the revenue that would have been collected if the energy was purchased
12 under RS 1823 or RS 1880. Please refer to section [3.1.7.1](#) for additional detail
13 on the load shifting determination methodology and results.

14 The adjusted ratepayer benefit is \$3.7 million as shown in [Table 9](#) below. BC Hydro
15 considers this adjusted value to reflect the net benefit to ratepayers for the Freshet
16 Rate Pilot.

Table 9 Adjusted Ratepayer Benefit by Pilot Year

Adjusted Ratepayer Benefit	Year 1 (\$,000)	Year 2 (\$,000)	Year 3 (\$,000)	Total (\$,000)
Preliminary ratepayer benefit	\$ 2,259	\$ 2,194	\$ 1,872	\$ 6,325
Less implementation costs	\$ (115)	\$ (30)	\$ (60)	\$ (205)
Less verified load shifting impact*	\$ (735)	\$ (1,160)	\$ (500)	\$ (2,395)
Adjusted Ratepayer Benefit	\$ 1,409	\$ 1,004	\$ 1,312	\$ 3,725
<i>*actuals for Year 1 and Year 2; forecast for Year 3</i>				

1 3.1.2 Wheeling Charges

2 BC Hydro's wheeling rate under RS 1892 is C\$3.00/MWh. FortisBC Inc.'s standby
3 rate is C\$4.00/MWh (as shown in Schedule 37 for Large Commercial Standby
4 Service).¹⁵ Under BC Hydro's Open Access Transmission Tariff, the wheeling rate
5 for non-firm point-to-point transmission service is C\$8.05 per MW of reserved
6 capacity per hour.¹⁶ Under Bonneville Power Administration's Open Access
7 Transmission Tariff, the wheeling rate for non-firm point-to-point transmission
8 service is US\$5.16/MWh.¹⁷

9 In the 2015 RDA, BC Hydro stated that the wheeling rate is intended to act as a
10 cost-recovery mechanism (i.e., margin adder) and to protect non-participant
11 ratepayers from risk. For greater certainty, the wheeling rate charged under RS 1892
12 does not represent a physical wheeling service. Retail access for load customers is
13 not available in BC Hydro's service territory. The wheeling rate of C\$3/MWh on net
14 RS 1892 energy volumes was set to reflect approximately 50 per cent of the
15 2015 BPA wheeling fee in \$CAD.

16 On most days during the Pilot, BC Hydro was typically in an export position.
17 Accordingly, the wheeling rate under RS 1892 provided a margin to BC Hydro equal
18 to the difference between the wheeling rate collected under RS 1892 and the
19 wheeling rate that would have been paid for a market energy sale. It also ensured
20 there was a notional contribution from participants towards the cost of transmission
21 during times of market import. BC Hydro collected \$1.44 million in total wheeling rate
22 revenue for the Pilot under RS 1892 (includes rate rider, excludes taxes). BC Hydro
23 considers that the wheeling rate has worked as intended. It functions as both a
24 contribution to BC Hydro's fixed costs and as an adder for margin and risk.

¹⁵ Schedule 37 can be found in FortisBC Inc's Electric Tariff at
<https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/Documents/FortisBCElectricTariff.pdf>.

¹⁶ Refer to BC Hydro OATT Schedule 01, dated April 1, 2018.

¹⁷ Please refer to footnote 14.

1 3.1.3 Baseline Determination, Adjustment and Approval

2 RS 1892 billing requires the establishment of individual customer site energy
3 baselines for High Load Hours (the HLH Baseline) and Low Load Hours (the
4 LLH Baseline) and a Reference Demand. These are seasonal electricity baselines.

5 The purpose of the energy baselines is to separate RS 1823 energy purchases from
6 incremental RS 1892 energy purchases during the Freshet Period. The purpose of
7 the Reference Demand is to cap the participating customer's highest kV.A demand
8 that is charged under RS 1823 during each month of the Freshet Period. There is no
9 demand charge for load taken above the Reference Demand because RS 1892
10 service is non-firm. BC Hydro has no obligation to build generation or upgrade its
11 transmission system to serve incremental RS 1892 load.

12 RS 1892 requires that electricity baselines be based on the customer's electricity
13 consumption billed under RS 1823 of the 2015 Freshet Period (i.e., this is the default
14 baseline determination period). However, as set forth in Special Condition 4 of
15 RS 1892, alternative baseline determinations are allowed subject to the parties'
16 agreement and Commission approval.

17 For any baselines that were not determined using 2015 electricity consumption, or
18 for which an adjustment was determined to be necessary, BC Hydro reviewed the
19 proposed alternative baselines with the customer and filed them with the
20 Commission for approval.¹⁸ The purpose of this customer-specific baseline review
21 and adjustment process was to ensure that electricity baselines were determined
22 using the best available information and could be expected to be representative of
23 normal expected electricity use during the Freshet Period.

¹⁸ The Commission approved the 2016, 2017 and 2018 baselines by Commission Order Nos. G-76-16, G-77-17 and G-94-18, respectively.

1 **3.1.4 Freshet Rate Engagement with Commercial and other Ratepayers**

2 BC Hydro has not engaged commercial and other ratepayer groups on extending the
3 Freshet Rate to general service customers as discussed in section 4.1 of the
4 Commission’s *Reasons for Decision Transmission Service Freshet Rate Pilot*
5 (Appendix A to Order No. G-17-16). BC Hydro anticipates that this would require a
6 significant engagement process, as was required with the Transmission Service
7 Freshet Rate, and is considering advancing further consultation with commercial
8 customers on this topic.

9 **3.1.5 Freshet Energy Oversupply and Mitigation Strategies**

10 This section provides an overview of the system conditions that result in energy
11 oversupply during freshet and a progress update on BC Hydro’s mitigation
12 strategies. For more detailed information, refer to “*BC Hydro System Conditions*
13 *during Freshet and Associated Management Strategies*,” filed as Appendix D to
14 BC Hydro’s Year 1 evaluation report.

15 **3.1.5.1 System Conditions**

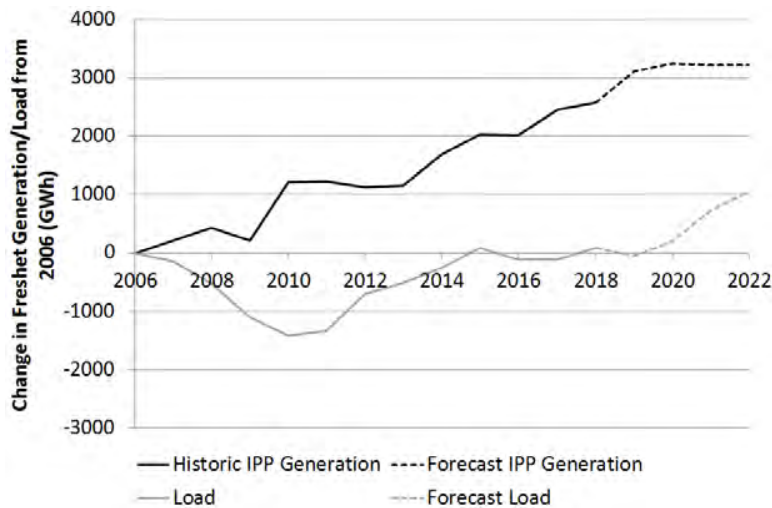
16 Energy oversupply during the Freshet Period of May through July is a seasonal
17 condition in the BC Hydro system. It arises from significant inflows¹⁹ due to snowmelt
18 and rain, which results in high generation from BC Hydro non-flexible resources
19 combined with an increase in must-take generation from IPPs and low domestic
20 load. When generation exceeds load and storage capability, must-take generation
21 cannot be stored in system storage for later use.

22 Refer to [Figure 2](#) below. It shows the annual change in May to July energy volumes,
23 from a 2006 base level, for must-take resources and BC Hydro integrated system
24 load. Since 2006, must-take resources have grown by about 2,500 GWh while
25 domestic load has remained relatively flat over the same period. Over the specific

¹⁹ Approximately one half of total annual system inflow volumes occur in the freshet.

1 2016 to 2018 period of the Pilot, must-take resources from Independent Power
 2 Producers (IPPs)²⁰ such as run-of-river facilities has grown by about 500 GWh.
 3 Some IPP growth remains forecasted until 2020, at which time all contracted
 4 resources are expected to have come on line.

5 **Figure 2 Change in May –July Energy Volumes**
 6 **from 2006 for EPA Purchases and**
 7 **BC Hydro Integrated System**
 8 **May - July Load**



²⁰ Forecast IPP generation is net of energy that can be economically turned down during freshet, thereby representing all must-take IPP energy and economic IPP energy. This reflects the IPP forecast released in October 2018.

1 **3.1.5.2 System Operations**

2 BC Hydro operates its system to serve domestic load while meeting environmental
3 and other non-power commitments while Powerex, BC Hydro's exclusive agent for
4 the marketing and trade of electricity, acts to optimize trade revenue on BC Hydro's
5 behalf.²¹ During freshet, the standard approach is to operate large basin generation
6 at minimum levels and shape energy into the highest value periods, given the limited
7 flexibility of the system. Reducing large system generation to minimum levels means
8 that much of the inflow is stored in large basin reservoirs for later use and must-take
9 generation is used to meet domestic load.

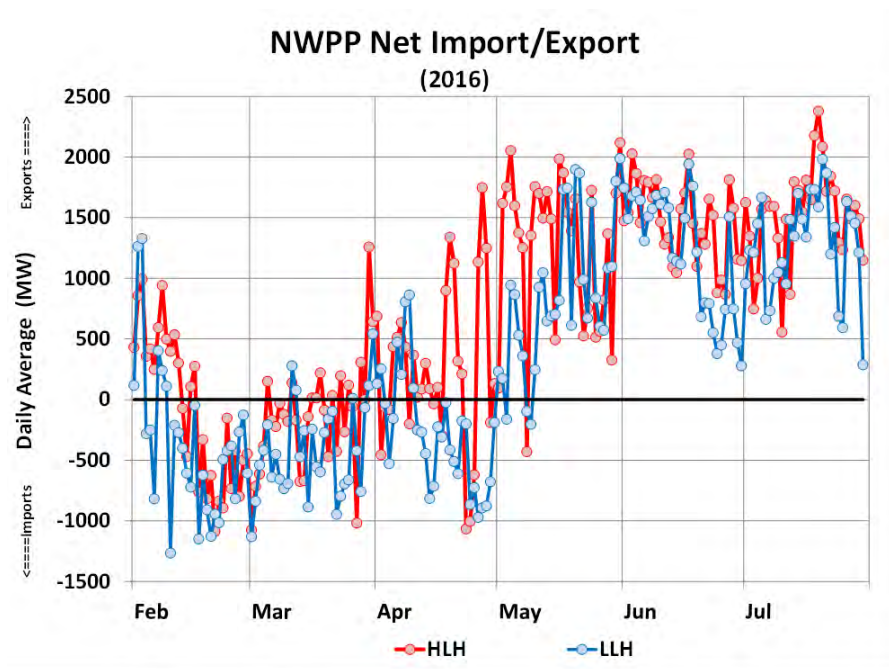
10 At any time where BC Hydro's system minimum generation is higher than system
11 load, there is an energy surplus. If there is insufficient storage for this surplus then
12 BC Hydro is forced to either export the surplus energy to market (typically at
13 depressed prices) or spill. Over time, the increase in BC Hydro's minimum
14 generation levels during freshet, combined with flat domestic load, has shifted
15 BC Hydro's load-resource balance from economic imports to forced exports.

16 From 2004 to 2009, BC Hydro had net import capability such that the system was
17 able to time shift low cost energy imports during freshet to the fall and winter
18 periods. However, from 2010 onwards, the acquisition of must-take energy has
19 diminished this import flexibility in certain years and transitioned BC Hydro to forced
20 exports.

²¹ Any references to market import and export in this report refer to the actions of Powerex, not BC Hydro.

1 The following charts provide additional context regarding the magnitude of
 2 BC Hydro’s actual Northwest Power Pool (NWPP)²² import/export activity during
 3 each year of the Pilot. In general, BC Hydro is on net exports for a significant portion
 4 of the freshet months (May through July) to manage higher volumes of surplus
 5 energy and to enable exports to US and Alberta markets on days when market
 6 prices are high.

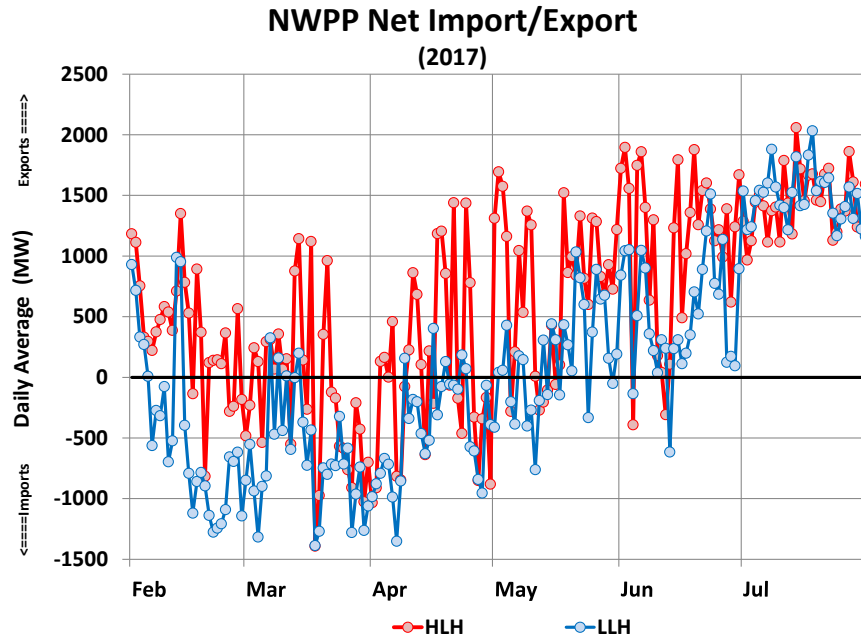
7 **Figure 3 BC Hydro’s Northwest Power Pool**
 8 **Imports/Exports: 2016 (Year 1)**



²² The Northwest Power Pool is comprised of regional electrical power generation and transmission entities. BC Hydro’s net NWPP imports/exports show the coordinated movement of energy from/into these regional markets.

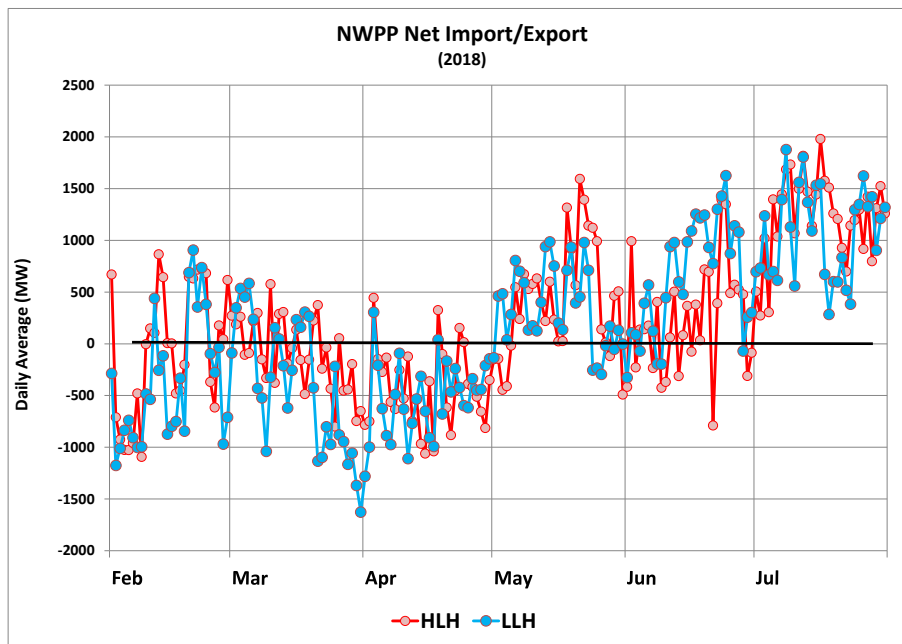
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Figure 4 BC Hydro's Northwest Power Pool Imports/Exports: 2017 (Year 2)



3
4

Figure 5 BC Hydro's Northwest Power Pool Imports/Exports: 2018 (Year 3)



1 **3.1.5.3 Mitigation Strategies**

2 BC Hydro has implemented a number of strategic actions to optimize the value of
3 surplus freshet energy from its portfolio of resources. These actions are generally
4 designed to limit must-take energy and/or increase load during freshet. As described
5 in section [1.4](#) of this report, the Freshet Rate has resulted in average incremental
6 domestic energy sales of approximately 150 GWh/year. Other mitigation strategies
7 are described below. For more detailed information, refer to Appendix D of
8 BC Hydro's Year 1 evaluation report.

- 9 • **Large Reservoir Drafting:** The large reservoirs in the BC Hydro system are
10 drafted to absorb freshet inflows while maintaining minimum generation. As
11 must-take generation has increased, drafts at the large basins have been
12 adjusted to account for the increases in must-take energy and reduction in low
13 cost market imports. However, the reservoirs remain limited in their ability to
14 capture all must-take energy on an hour-by-hour and daily basis due to real
15 time operating constraints and minimum generation required.
- 16 • **IPP Time of Delivery Adjustments:** Many of BC Hydro's IPP Electricity
17 Purchase Agreements (**EPAs**) include a provision that adjusts the IPP payment
18 price for energy volumes delivered depending on the month and time of day.
19 This provision was included in the standard form EPA for the more recent
20 power acquisition programs including the Fiscal 2006 Open Call for Power, the
21 Clean Power Call and the Standing Offer Program. The intent is to encourage
22 IPPs to build and operate projects that deliver energy at times which better
23 match system needs. BC Hydro utilizes time-of-delivery adjustments that reflect
24 the lower value of freshet energy deliveries.
- 25 • **IPP Turn Down:** Some Electricity Purchase Agreements include a provision
26 that provides BC Hydro with the right to request an IPP to turn down or reduce
27 its generation output for a certain period of time, subject to the operating

1 constraints of the generating facility. During a turn down, BC Hydro avoids the
 2 variable cost of generation. In the case of a gas-fired or biomass generating
 3 facility, a large portion of the variable cost of generation is associated with fuel.
 4 Under the Electricity Purchase Agreement, these fuel cost savings are passed
 5 on to BC Hydro in the form of a lower unit energy price that is intended to cover
 6 only the IPP’s fixed cost of generation during the period that the facility is turned
 7 down. By exercising its turn down right during freshet, BC Hydro is able to
 8 realize cost savings and reduce the amount of must-take surplus energy.

9 **3.1.6 Implementation Costs**

10 BC Hydro’s implementation costs for each year of the Pilot are shown in [Table 10](#)
 11 below. Total implementation costs for the Pilot were \$205,000. Implementation costs
 12 included rate design and regulatory proceeding costs (these include the costs of the
 13 2016 freshet rate proceeding workshop, Participant Assistance Cost Awards for
 14 intervener participation and costs for BC Hydro’s external legal support), billing,
 15 customer and stakeholder engagement, and some of the costs of evaluation report
 16 preparation (e.g., additional data collection and analysis). Year 3 billing costs were
 17 higher than in Year 1 and Year 2 to incorporate a visualization model of invoiced
 18 data for participant customers. All other staff and administration costs were funded
 19 under existing operating budgets using existing staff.

20 **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 **3.1.7 Load Shifting Impacts**

2 Load shifting was a key cost-shifting concern raised by interveners and Commission
3 staff during the 2015 RDA. A load shift is deemed to occur when a customer
4 changes the timing of electricity consumption to buy more during freshet months and
5 less in non-freshet months for no net change in total annual energy consumption.

6 BC Hydro considers that the definition of load shift energy should also include
7 energy that the customer would have purchased anyway, such as for natural load
8 growth and use of RS 1892 as a replacement service for RS 1880.²³

- 9 • Natural load growth is defined as year-over-year growth in electrical load that
10 has occurred over time at the customer site and which is independent of the
11 Freshet Rate.
- 12 • An event of RS 1880 replacement occurs when a customer's self-generation
13 plant experiences a forced outage. When the self-generation is forced out of
14 service, and the customer plant remains operational, grid imports typically
15 increase to serve plant load. This incremental take of energy would normally
16 be served under RS 1880.

17 Collectively, for verified load-shift energy, the revenue impact is calculated as the
18 difference between the actual revenue collected under RS 1892 and the revenue
19 that would have been collected if the volume of load-shift energy was purchased
20 under RS 1823 or RS 1880.

21 **3.1.7.1 Analysis Methodology**

22 BC Hydro sought to identify and verify the energy consumption impact of any load
23 shifting events by participant customers in Year 1 (2016) and Year 2 (2017). To

²³ In BC Hydro's Preliminary Evaluation Report for Year 2, filed on December 8, 2017 as Attachment 3 in its Transmission Service Freshet Rate Pilot Application for Year 3 Extension, an analysis of Year 1 load shifting was included which did not include the impact of natural load growth.

1 perform the analysis, a complete set of adjusted energy and RS 1823 Stepped Rate
2 Energy CBL data is required. Accordingly, BC Hydro needed to first complete its
3 F2017 and F2018 CBL annual review process for participant customers. This review
4 provides comprehensive customer site-specific information for events which have
5 been reviewed and verified to increase or decrease energy consumption during the
6 fiscal year. The Final CBLs for each customer are subsequently filed with the
7 Commission for final approval.²⁴ Additionally, BC Hydro requires knowledge of
8 specific customer actions taken during the Freshet Period.

9 BC Hydro's steps to assess load shifting impacts are described below.

10 **Step 1: Survey all RS 1892 customer participants to identify specific actions**
11 **taken to increase load during the 2016 and 2017 Freshet Period:**

- 12 • Identify customers that have self-identified a load shifting event, such as
13 moving a regular plant maintenance shutdown to a period outside the Freshet
14 Period; and
- 15 • Identify customers with self-generation outages (forced), where the load increase
16 would be expected to occur in the absence of the freshet rate.

17 **Step 2: Prepare a data set for participant customers with actual RS 1892**
18 **energy sales in Year 1 (26 sites) and Year 2 (32 sites), which includes:**

- 19 • Baseline data (F2016);
- 20 • Final F2016 Energy CBL;
- 21 • Actual F2016 RS 1823 energy consumption (including by month); and
- 22 • RS 1892 energy baselines and Reference Demand.

²⁴ The final F17 CBLs were filed for approval on December 20, 2017 and approved by Commission Order No. G-49-18 issued on March 2, 2018. The final F18 CBLs were filed for approval on November 15, 2018 and have not yet received approval from the Commission.

1 Year 1 Data (F2017)

- 2 • Actual Year 1 RS 1892 energy sales in HLH and LLH;
- 3 • Actual F2017 RS 1823 energy consumption (including by month); and
- 4 • Final F2017 Energy CBL.

5 Year 2 Data (F2018)

- 6 • Actual Year 2 RS 1892 energy sales in HLH and LLH;
- 7 • Actual F2018 RS 1823 energy consumption (including by month); and
- 8 • Final F2018 Energy CBL.

9 Step 3: Compare each customer's F2017 and F2018 annual energy sales²⁵ with
10 F2016 annual energy sales under RS 1823:

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

20 Step 4: For customers with lower RS 1823 energy sales:

- 21 • BC Hydro reviewed the Final CBL Statements and supporting documentation
22 for each customer to identify events that were verified to reduce energy
23 consumption, including:

²⁵ BC Hydro used annual energy sales for the comparison since monthly energy consumption is too granular and subject to customer-specific variances which is not suitable for this type of analysis.

-
- 1 ▶ BC Hydro load curtailment events and system outages;
- 2 ▶ Demand side management projects;
- 3 ▶ Changes in self-generation output (contracted and non-contracted);
- 4 ▶ Force majeure events/unusual downtime;
- 5 ▶ Plant/equipment shutdowns;
- 6 ▶ Production and/or operating changes; and
- 7 ▶ Customer-reported events of load shifting.
- 8 • For each customer, identify the primary drivers of the RS 1823 energy sales
- 9 variance (i.e., decrease) and discern any actual and/or unexplained load
- 10 variance that might be considered to reflect a load shift.

11 **Step 5: For customers with higher RS 1823 energy sales:**

- 12 • BC Hydro reviewed the Final CBL Statements and supporting documentation
- 13 for each customer to identify events that were verified to increase energy
- 14 consumption, including:
- 15 ▶ Production and/or operating changes;
- 16 ▶ Plant capacity increase/new equipment;
- 17 ▶ Changes in energy savings from demand side management projects; and
- 18 ▶ Changes in self-generation output (contracted and non-contracted) including
- 19 forced outages of generation plant.
- 20 • For each customer, identify the primary drivers of the RS 1823 energy sales
- 21 variance (i.e., increase) and discern any natural load increase and/or
- 22 unexplained load variance that might be considered to reflect a load shift.

Step 6: Assess the financial impact of the load shift:

- Determine the volume of energy associated with each load-shift event, including separation of the energy volume into HLH and LLH periods where applicable;
- Compare actual RS 1892 revenue with the revenue that would have been collected under RS 1823 and/or RS 1880, as applicable; and
- Determine the CBL annual reset impact (if any) of the load shift event.

Load-shifting Analysis Results

The results²⁶ of BC Hydro's assessment of load shifting for Year 1 and Year 2 are shown in [Table 11](#) below. The revenue impact reflects the verified energy consumption impact of each event. Results include:

- One customer site with a self-reported load shift in Year 1;
- Five customer sites with natural load increase (two in Year 1, three in Year 2);
- No customer sites with unexplained load variances; and
- Two customer sites with forced generator outage that used RS 1892 as a replacement service for RS 1880 (one in Year 1, one in Year 2).

²⁶ BC Hydro considers the load shifting analysis to be extremely complex. It requires a detailed understanding of the many dynamic factors that impact electrical load at each unique customer site. This can be difficult to identify, separate and verify with certainty. The analysis is based on the best available information and application of expert judgement.

1 **Table 11 Load Shifting Results by Assessment**
2 **Category**

Load Shifting Category	# of Sites	Year 1	Year 2	Totals
Customer-reported load shift	1	\$ (32)	\$ -	\$ (32)
Unexplained load variance	0	\$ -	\$ -	\$ -
Natural load increase	5	\$ (470)	\$ (340)	\$ (810)
RS 1880 replacement service	2	\$ (233)	\$ (820)	\$ (1,053)
Total	8	\$ (735)	\$ (1,160)	\$ (1,895)

3 The most significant revenue impact arises from the use of RS 1892 service as a
4 replacement for RS 1880 service. The revenue impact reflects the differential
5 between the prevailing RS 1880 and RS 1892 prices.

6 **3.1.7.2 Adjusted Ratepayer Benefit**

7 Costs related to implementation and verified load shifting impacts have been used to
8 adjust BC Hydro’s preliminary estimate of ratepayer benefit. Refer to [Table 12](#) below.

9 **Table 12 Estimate of Adjusted Ratepayer Benefit**
10 **by Year**

Ratepayer Benefit - Adjustment Description	Year 1 (\$,000)	Year 2 (\$,000)	Year 3 (\$,000)	Total (\$,000)
Preliminary ratepayer benefit	\$ 2,259	\$ 2,194	\$ 1,872	\$ 6,325
Less implementation costs	\$ (115)	\$ (30)	\$ (60)	\$ (205)
Less customer-reported load shift impact	\$ (32)	\$ -	\$ (50)	\$ (82)
Less unexplained load variance impact	\$ -	\$ -	\$ -	\$ -
Less natural load growth impact	\$ (470)	\$ (340)	\$ (450)	\$ (1,260)
Less RS 1880 replacement service impact	\$ (233)	\$ (820)	\$ -	\$ (1,053)
Adjusted Ratepayer Benefit	\$ 1,409	\$ 1,004	\$ 1,312	\$ 3,725
<i>*actuals for Year 1 and Year 2; forecast for Year 3</i>				

11 The adjusted ratepayer benefit is \$1.4 million in Year 1 and \$1.0 million in Year 2.
12 An analysis of load shifting has not been performed for Year 3. However, BC Hydro
13 confirms that no instances of forced generator outage in Year 3 were identified such
14 that RS 1892 was used as a replacement service for RS 1880. Accordingly, and

1 assuming an adjustment for load shifting of approximately (\$0.5 million) based on an
2 upper bound of Year 1 and Year 2 trend results, BC Hydro considers the adjusted
3 ratepayer benefit for Year 3 to be in the order of \$1.3 million.

4 For the Pilot, BC Hydro has determined an adjusted ratepayer benefit of
5 approximately \$3.7 million. Based on this positive outcome, BC Hydro considers that
6 the Freshet Rate provides a net benefit to non-participant ratepayers.

7 **3.2 Directive 5 of Commission Order No. G-17-16**

8 **3.2.1 Stakeholder Consultation for Permanent Freshet Rate**

9 BC Hydro conducted extensive customer and stakeholder consultation on the
10 freshet rate, including the specific question of whether the freshet rate should be
11 made permanent. Consultation activities included customer meetings, email surveys
12 and consultation workshops conducted over a three year period. Refer to section [4.3](#)
13 of this report and Attachment 3 for details of the customer survey and feedback form
14 used.

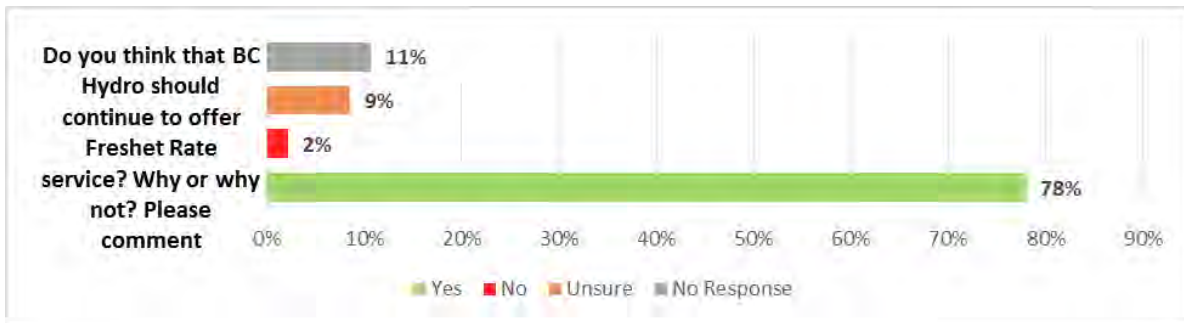
- 15 • From the written responses to email surveys sent to participant customers at
16 the end of Year 2 (in September 2017) and Year 3 (in September 2018), there
17 is clear evidence of support for the freshet rate to continue and for it to be made
18 permanent. This support was provided even where the opportunity for a
19 customer to participate might be limited. For example, one customer stated:

20 *“I believe the Freshet Rate is beneficial overall to have. While*
21 *the ability to leverage it for some industries is limited, it doesn’t*
22 *take away from the principles the program is trying to achieve.”*

- 23 • From the written responses to feedback forms received from customers and
24 stakeholders at engagement workshops held in October 2018, there is strong
25 support for the freshet rate to continue. Refer to [Figure 6](#) below. Based on
26 written feedback received, 78 per cent of respondents support continuance of

1 the Freshet Rate while only 2 per cent do not. The balance of respondents were
2 unsure or did not comment.

3 **Figure 6 October 2018 Workshop - Written**
4 **Feedback Form Results – Freshet Rate**
5 **Continuance**



6 • However, from feedback received at the October and November workshops,
7 there was no clear preference as to whether the rate should be made
8 permanent or continue on a pilot basis. Refer to section [4.3](#) of this report for
9 more detail. In part, the question of whether the rate should be made
10 permanent turns on whether BC Hydro proposes to make certain
11 customer-requested changes to the Freshet Rate criteria such as to: (a) replace
12 the month of July with the month of April; and (b) replace the current seasonal
13 billing methodology for net RS 1892 energy with monthly settlement.

1 **3.3 Directive 6 of Commission Order No. G-17-16**

2 **3.3.1 Estimate of Magnitude and Value of Freshet Energy Surplus**

3 The sections below cover the magnitude and value of the freshet energy surplus.

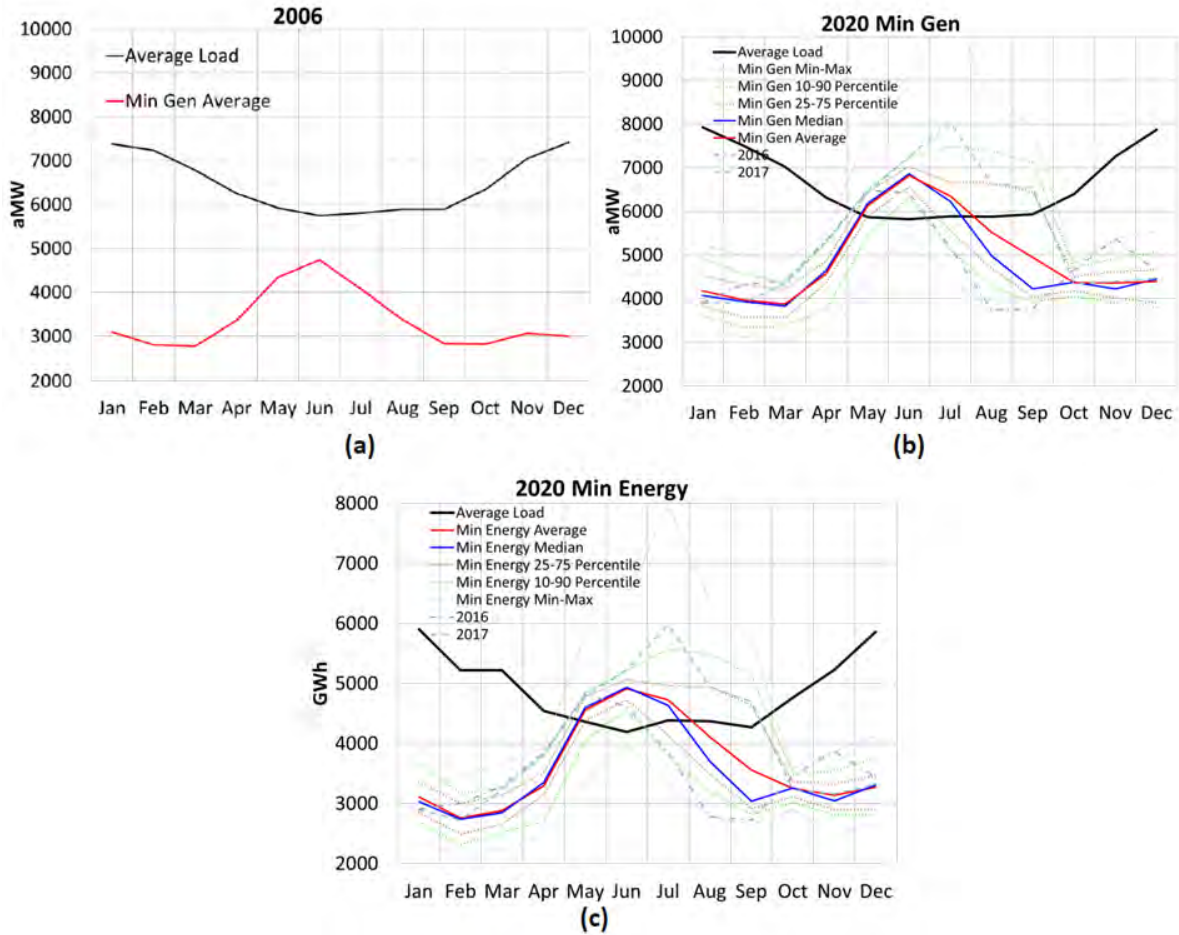
4 **3.3.1.1 *Magnitude of Freshet Energy Surplus***

5 BC Hydro's estimate of the magnitude of freshet surplus energy in each year for the
6 period 2006 to 2016 is provided in Figure 9 of section 3.3 of Appendix D of
7 BC Hydro's Year 1 evaluation report. This modelling analysis has not been updated
8 to include 2017 and 2018 due to resource limitations.

9 As described in section [3.1.5](#) of this report, compared to calendar 2006, BC Hydro
10 had approximately 2,500 GWh of additional must-take energy during the freshet
11 periods of calendar 2016 through 2018. For the typical freshet peak month of June,
12 BC Hydro has moved from a net import position of approximately 1,000 average MW
13 in 2006 to a net export position of approximately 500 average MW in 2018 under
14 average inflow conditions. Typically, export conditions begin in mid-May as inflows to
15 large reservoirs ramp-up, is highest in June, and recedes by mid-July. Refer to
16 [Figure 7](#) below.

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**Figure 7 (a) 2006 Minimum Generation²⁷ and Load under Average Inflow Conditions
(b) 2020 Minimum Generation²⁸ and Load under Various Inflow Conditions
(c) 2020 System Minimum Energy and Load under Various Inflow Conditions**



- 7 • Chart (a) shows that, under average water inflow conditions, System Minimum
8 Generation in 2006 was less than average domestic load. This provided
9 BC Hydro with approximately 1,000 average MW of net market import flexibility.

²⁷ Minimum generation is modeled using all historic inflow sequences for the resource portfolio in year 2006.

²⁸ Minimum generation is modeled using all historic inflow sequences for the resource portfolio in year 2020. The water conditions for 2016 and 2017 are shown on the plot to show where these water conditions would fall in relation to the range of historical inflow sequences.

- 1 • Chart (b) shows Minimum Generation²⁹ and chart (c) shows Minimum Energy,³⁰
2 both of which exceed average domestic load under most water inflow
3 conditions. The modeling incorporates actual 2016 and 2017 inflows to illustrate
4 the impact of inflow variance

5 **3.3.1.2 Value of Freshet Energy Surplus**

6 **Market Energy Prices**

7 Certain electricity trade transactions made by Powerex on behalf of BC Hydro take
8 place in, or pass through, the Mid-Columbia (Mid-C) electricity market in the US
9 Pacific Northwest. Prices at Mid-C are generally at their lowest levels during the
10 freshet period. This is because the Pacific Northwest has freshet energy oversupply
11 conditions similar to B.C. The oversupply is primarily due to heavy generation at
12 U.S. hydroelectric plants on the Columbia River, driven by snowmelt runoffs coupled
13 with must-run requirements to support fisheries objectives and low domestic loads.
14 Over the last ten years, the addition of about 5,000 MW of wind generation in the
15 U.S. Pacific Northwest with higher spring output, together with production tax credits
16 in certain jurisdictions, has further depressed freshet prices. In fact, these unique
17 conditions have even led to the periodic appearance of negative Mid-C prices,
18 particularly in off-peak hours.

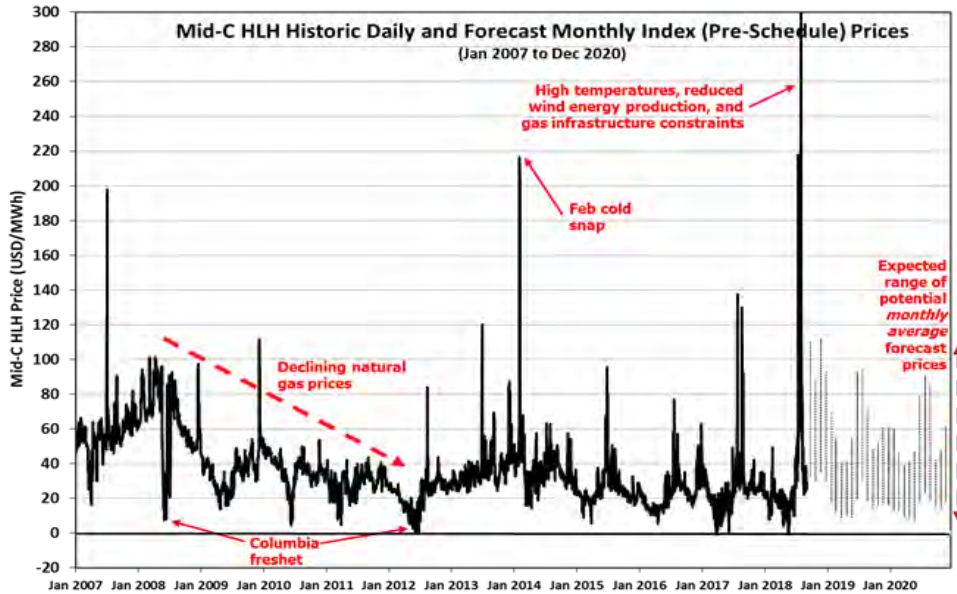
19 [Figure 8](#) and [Figure 9](#) below show historical daily Mid-C energy (Intercontinental
20 Exchange (ICE) Index) prices in \$US/MWh from January 2007 through
21 October 2018 and forecast monthly prices thereafter to January 2019. In general,
22 Mid-C market prices have trended down over the past decade. Prices are higher in
23 on-peak hours than in off-peak hours.

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

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.

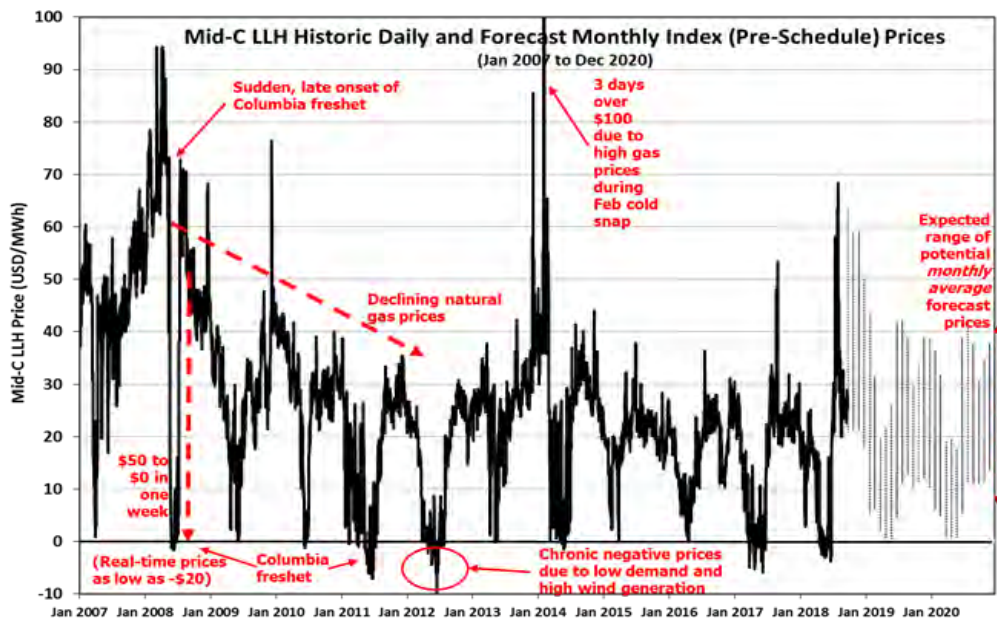
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Figure 8 Mid-C HLH - Historic Daily and Forecast Prices



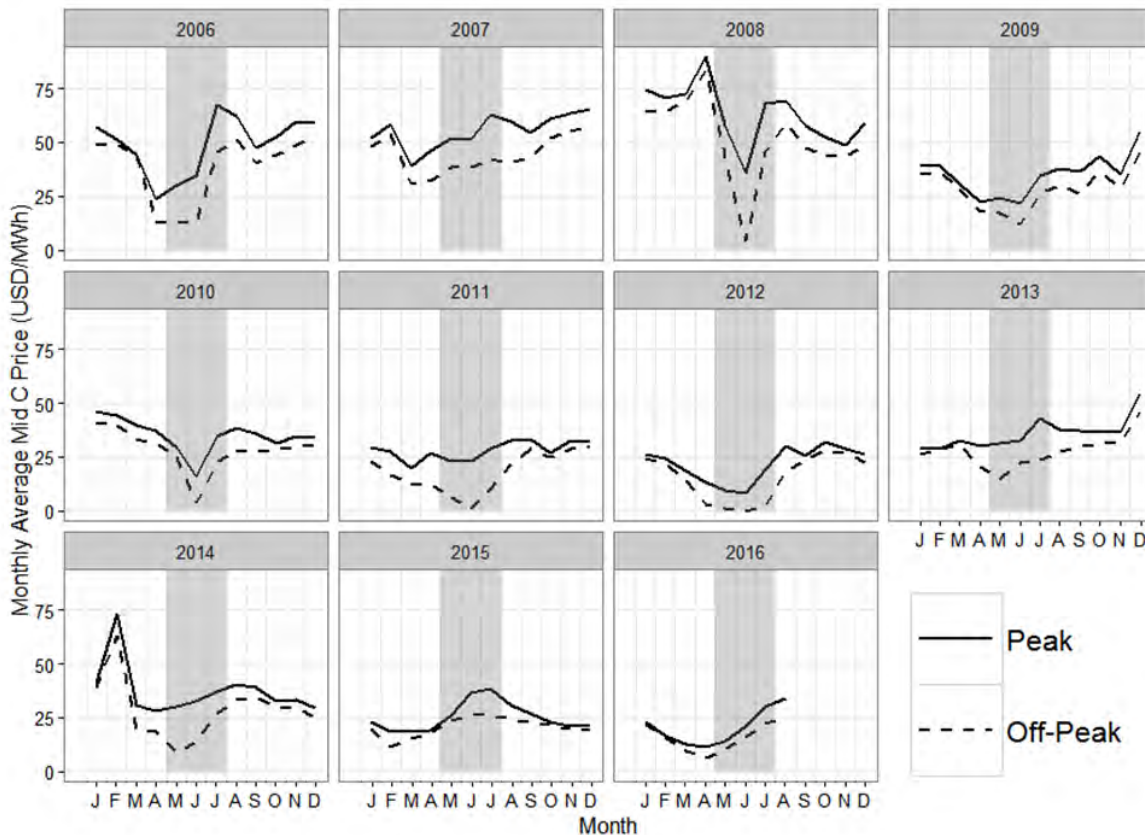
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Figure 9 Mid-C LLH - Historic Daily and Forecast Prices



1 [Figure 10](#) below shows historical average monthly Mid-C peak and off-peak prices
 2 for the years 2006 to 2016. The freshet period is identified by the grey shaded area.
 3 The charts show that market prices typically reach their lowest levels during the
 4 freshet period, especially in off-peak periods.

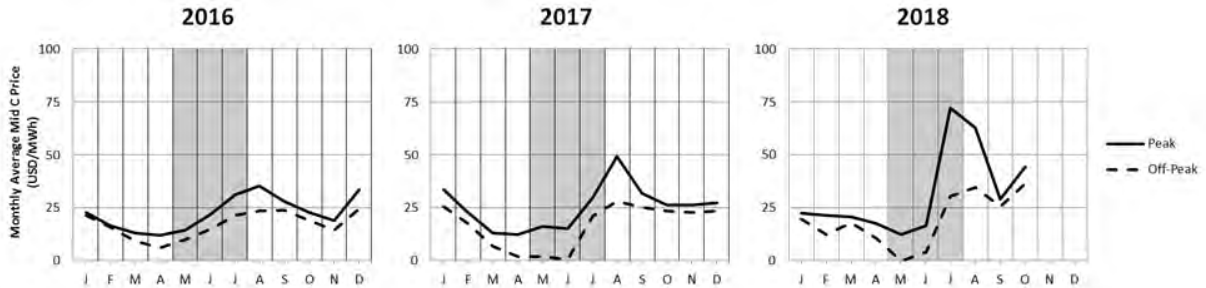
5 **Figure 10** **Historic Monthly Average Peak and**
 6 **Off-Peak Electricity Prices at Mid-C**
 7 **(\$US/MWh Nominal), 2006 to 2016**



8 [Figure 11](#) below updates this price history to show historical average monthly Mid-C
 9 peak and off-peak prices in \$US/MWh for the three years of the Pilot (i.e.,
 10 calendar 2016 to 2018). The freshet period continues to be characterized by low
 11 market prices in LLH. However, prices during HLH typically increase from late
 12 June through July.

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Figure 11 Historic Monthly Average Peak and Off-Peak Electricity Prices at Mid-C (\$US/MWh Nominal), 2016 to 2018



4 In July 2018, there was a large spike in prices, particularly in peak hours. This was a
5 result of extremely high temperatures throughout the Western Electricity
6 Coordinating Council (**WECC**) region driving increased load, in combination with lack
7 of wind energy production and gas infrastructure constraints.

8 **Estimate of Freshet Surplus Energy Value**

9 Surplus energy values are directly linked to market prices during freshet. When
10 market prices are lower, the value is reduced. When market prices are higher, the
11 value is increased. As described previously, in any given hour, there is an energy
12 surplus when hourly system minimum must-take energy exceeds integrated hourly
13 system load. This surplus energy must either be exported or spilled:

- 14 • Surplus energy is exported when a net revenue gain would be realized (i.e., the
15 Mid-C market price, net of wheeling and losses is > \$0) and sufficient
16 transmission capacity exists for physical export; or
- 17 • Surplus energy is spilled if the export is not economic and would result in a
18 financial loss. The salvage value of spill energy is zero.³¹

³¹ The \$0 value does not include any potential capital or maintenance costs associated with energy spill.

1 **Estimated Salvage Value**

2 For the period of the Pilot, the estimated salvage value for the average volume of
 3 surplus energy can be considered as the product of daily estimated forced export
 4 volumes and the weighted average daily Mid-C price (less wheeling and losses).
 5 [Table 13](#) below provides an estimate of the salvage value of surplus energy across
 6 the Pilot Periods.

7 **Table 13 Estimated Average Value of Surplus**
 8 **Energy in Pilot Period (2016 – 2018)**

	2016	2017	2018
	Year 1	Year 2	Year 3
Surplus Energy (summation of energy surplus on surplus days)	117	706	597 <i>GWh</i>
<i>Number of Days of forced exports</i>	<i>19</i>	<i>49</i>	<i>49</i> <i>Days</i>
Weighted Average Mkt Price (net of wheel on surplus days)	\$ 11.4	\$ 6.3	\$ 3.9 <i>US\$/MWh</i>
<i>Average exchange Rate</i>	<i>1.30</i>	<i>1.32</i>	<i>1.30</i> <i>CANS/US\$</i>
Weighted Average Mkt Price (net of wheel on surplus days)	\$ 14.8	\$ 8.4	\$ 5.0 <i>CANS/MWh</i>
SALVAGE VALUE:	\$ 1.7	\$ 5.9	\$ 3.0 <i>Can\$M</i>

9 BC Hydro’s order of magnitude estimate for the salvage value of forced energy
 10 exports during the Pilot is approximately \$1.7 million in Year 1, \$5.9 million in Year 2
 11 and \$3.0 million in Year 3, for a total of \$10.6 million. In interpreting these values, it
 12 is important to note that both energy volume and price are key drivers of the value. A
 13 higher salvage value created by a higher volume of forced exports is not
 14 advantageous to BC Hydro/Powerex, whereas a higher salvage value created by
 15 higher prices is. However, absent forced exports, BC Hydro/Powerex is still able to
 16 capitalize on higher priced market conditions using system storage flexibility.

1 **3.4 Section 7.3.4.6 of 2015 RDA**

2 **3.4.1 Did the Rate Provide RS 1823 Customers with Lower Cost Options?**

3 BC Hydro considers that the Freshet Rate generally provided customers with a lower
4 cost option for incremental load. Average RS 1892 unit energy prices³² for each
5 month of the Pilot, are shown in [Table 14](#) below. Except for July 2018, the average
6 RS 1892 unit energy price for each month of the Pilot was lower than the RS 1823
7 Tier 1 price.

8 **Table 14 Average RS 1892 Energy Price by Freshet**
9 **Month in \$CAD/MWh compared to**
10 **RS 1823 Tier 1 Energy Price**

Freshet Month	Ave. RS 1892 HLH energy price C\$/MWh	Ave. RS 1892 LLH energy price C\$/MWh	RS 1823 Tier 1 energy price C\$/MWh
May-18	\$ 13.74	\$ (0.30)	\$ 42.44
Jun-18	\$ 19.91	\$ 5.57	\$ 42.44
Jul-18	\$ 84.18	\$ 39.82	\$ 42.44
May-17	\$ 20.35	\$ 2.68	\$ 41.20
Jun-17	\$ 18.50	\$ 1.05	\$ 41.20
Jul-17	\$ 36.10	\$ 26.92	\$ 41.20
May-16	\$ 17.80	\$ 13.09	\$ 39.81
Jun-16	\$ 26.01	\$ 18.15	\$ 39.81
Jul-16	\$ 38.38	\$ 27.92	\$ 39.81

11 The actual average price paid for total RS 1892 energy purchases (including the
12 \$3/MWh wheeling rate) compared to RS 1823 energy charges is shown in [Table 15](#)
13 below on an aggregated basis. Actual average energy prices paid for RS 1892 HLH
14 and LLH energy are also provided.³³

³² Converted to \$CAD using daily Bank of Canada Exchange rate and includes C\$3.00 per MWh wheeling rate.

³³ Reflects the average price for net RS 1892 HLH and LLH energy on an aggregated basis, including \$3/MWh wheeling rate. The average price for individual customers will be higher or lower.

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**Table 15 Average Actual RS 1892 Energy Prices
Paid Compared to RS 1823 Energy Prices**

Average Energy Charges by Rate Schedule	F2017		F2018		F2019	
	C\$/MWh	C\$/MWh	C\$/MWh	C\$/MWh	C\$/MWh	C\$/MWh
Aggregate average RS 1892 energy charge	\$ 24.88	\$ 22.50	\$ 26.31			
Average RS 1892 HLH energy charge	\$ 28.83	\$ 25.74	\$ 34.50			
Average RS 1892 LLH energy charge	\$ 19.53	\$ 10.72	\$ 12.28			
RS 1823 Tier 1 energy charge	\$ 39.81	\$ 41.20	\$ 42.44			
RS 1823 Tier 2 energy charge	\$ 89.20	\$ 92.32	\$ 95.09			
RS 1823 Energy Charge A	\$ 44.75	\$ 46.31	\$ 47.70			

3 **3.4.1.1 Stakeholder Request**

4 The tables below are responsive to stakeholder requests in the October and
5 November 2018 workshops. BC Hydro committed to provide information related to
6 the number of days of negative Mid-C pricing and the number of days where Mid-C
7 pricing was higher than the RS 1823 Tier 1 energy price. These prices do not
8 include the \$3/MWh wheeling rate.

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**Table 16 Number of Days of Negative Mid-C
Market Pricing**

F17 Freshet (2016-05-01 to 2016-07-31)		F18 Freshet (2017-05-01 to 2017-07-31)		F19 Freshet (2018-05-01 to 2018-07-31)	
HLH (# of days)	LLH (# of days)	HLH (# of days)	LLH (# of days)	HLH (# of days)	LLH (# of days)
0	0	2	25	5	33

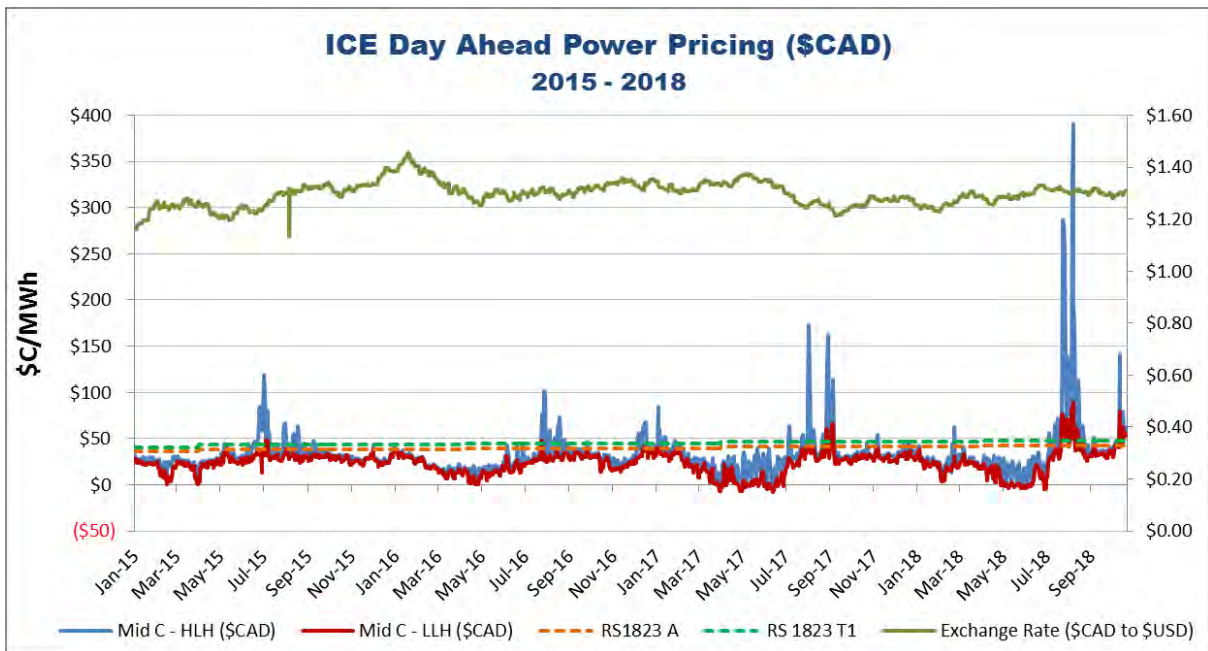
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**Table 17 Number of Days where the Mid-C Market
Price Exceeded the RS 1823 Tier 1
Energy Price**

F17 Freshet (2016-05-01 to 2016-07-31)		F18 Freshet (2017-05-01 to 2017-07-31)		F19 Freshet (2018-05-01 to 2018-07-31)	
HLH (# of days)	LLH (# of days)	HLH (# of days)	LLH (# of days)	HLH (# of days)	LLH (# of days)
11	2	10	0	19	10

1 Stakeholders also requested that BC Hydro show Mid-C energy prices relative to
 2 RS 1823 energy prices. [Figure 12](#) compares actual ICE Index Mid-C market energy
 3 prices³⁴ in HLH and LLH for the three years of the Pilot with BC Hydro’s RS 1823
 4 Tier 1 and Part A energy charges. Mid-C prices have been converted to \$CAD using
 5 the daily average Bank of Canada exchange rate. In general, when market prices
 6 are below the prevailing RS 1823 energy price, there is a price signal to increase
 7 electricity use.

8 **Figure 12 Mid-C Market and RS 1823 Energy Prices**



³⁴ Mid-C prices in \$US/MWh based on the ICE Index were converted to \$CAD/MWh on a daily basis.

1 **3.4.2 Did the Rate have Positive or Negative Impacts on**
2 **Non-participating Customers?**

3 Refer to section [3.1.1](#) of this report. BC Hydro's analysis indicated that the rate had
4 benefited both participant and non-participant customers. For the Pilot, BC Hydro
5 has estimated the electricity cost reduction benefit for participant customers to be
6 approximately \$9.2 million and the net benefit for non-participant customers to be
7 approximately \$3.7 million.

8 **3.4.3 How many RS 1823 Customers used the Rate? What were the**
9 **Volumes of Use?**

10 Refer to section [1.4](#) of this report.

11 **3.4.4 How did Customers use the Rate?**

12 Actions taken by customers to increase load include:

- 13 • Higher utilization of existing production capacity;
- 14 • Production optimization (such as running equipment at full speed/maximum
15 capacity);
- 16 • Operating changes (such as by adding shifts) and grade changes (such as to
17 run a more energy intensive grade mix);
- 18 • Re-scheduling of maintenance shutdowns into non-freshet months;
- 19 • Reduction/shortening of planned downtime to maximize plant uptime (such as
20 by adding shifts to complete maintenance work faster);
- 21 • Voluntary generator turndown (such as to reduce or curtail self-generation
22 when economic); and
- 23 • Forced generator outage (such as when a piece of generation equipment
24 unexpectedly fails and is forced out of service).

1 **3.4.5 To what Extent did Shifting Contribute to Higher Freshet Energy?**

2 BC Hydro conducted its own analysis and consulted with participant customers to
 3 identify and verify the volumes of energy deemed to be associated with load shifting
 4 activities. Refer to section [3.1.7](#) for a detailed summary of BC Hydro’s methodology.
 5 [Table 18](#) below shows the verified energy volume impact of identified load-shifting
 6 events by category. BC Hydro’s analysis indicates that, collectively, these events
 7 contributed to an approximately 15 per cent higher volume of RS 1892 energy than
 8 may otherwise have been the case.

9 **Table 18 Verified Load Shifting Energy Volume by**
 10 **Category and Year**

Load Shift Category	Year 1 MWh	Year 2 MWh	Totals MWh
Customer-reported load shift	3,400	-	3,400
Unexplained load variance	-	-	-
Natural load increase	10,274	12,225	22,499
RS 1880 replacement service	7,284	14,412	21,696
Total	20,958	26,637	47,595

11 **3.4.6 Was there any Shifting within the Freshet Period from HLH to LLH?**

12 BC Hydro asked customers to identify whether they made operational changes to
 13 shift load from HLH to LLH. Only one customer advised that it modified its operating
 14 hours with the intent to shift a portion of incremental production from HLH to LLH.
 15 The operational change was a minor adjustment by pushing back the afternoon shift
 16 start time. This had the effect of moving a very small volume of production/operation
 17 from HLH into LLH. The energy volume and financial impact of this is not material.

1 **3.4.7 Were there any Issues with Setting Baselines, Implementation or**
2 **Billing?**

3 There were no issues with setting baselines, implementation or billing

- 4 • The baseline determination and adjustment process was well-understood and
5 well-supported by customers. Specifically, customers provided feedback that
6 the process was clear and the baselines were fair. All adjusted customer
7 baselines filed with the Commission were approved as filed. There were no
8 baseline disputes.
- 9 • BC Hydro considers that the rate was implemented smoothly. Customer
10 workshops were held across the province to explain the rate and encourage
11 participation. RS 1823 customers advised that the sign-up process for the rate
12 was straight-forward (per Special Condition 3 of RS 1892) and the opt-out
13 provision of the rate (per Special Condition 6 of RS 1892) helped to de-risk their
14 participation.
- 15 • For billing, participant customers were sent a daily email summary of Mid-C
16 market prices for the following day(s). The summary included an estimate of the
17 “all in” daily RS 1892 price for market reference-priced energy in HLH and LLH.
18 Email warnings were also sent to advise customers of high-priced days. This
19 provided customers with clear visibility to reference prices that would apply for
20 incremental energy use.
- 21 • Participant customers were billed for net RS 1892 electricity on a one-time
22 basis in August of each year to allow for the seasonal reconciliation of HLH and
23 LLH Net Freshet Energy over the entire freshet period. The monthly invoice for
24 each of May, June and July also included summary detail regarding “unbilled
25 energy” in each of HLH and LLH. This provided customers with an estimate of
26 the monthly volume of incremental RS 1892 energy for accrual.

- 1 • There was some minor customer confusion regarding the definition of HLH and
2 LLH days for statutory holidays in British Columbia during the freshet period
3 (i.e., Victoria Day and Canada Day) which differ from the North American
4 Reliability Corp. (**NERC**) statutory holidays that apply to RS 1892 energy pricing
5 (i.e., Memorial Day and Independence Day). BC Hydro confirmed with
6 customers that ICE index pricing for Mid-C (on-peak and off-peak) is specific to
7 the day, or days, ahead as set out in its pricing notice. For instance, Thursday
8 ICE index prices apply to Friday and Saturday; Friday ICE index prices apply to
9 Sunday and Monday; Monday ICE index prices apply to Tuesday, and so on.
10 BC Hydro ensured that customers had certainty as to the application of this pre-
11 schedule pricing information for statutory holidays.

12 **3.4.8 Did the Pilot Impact Customer’s Conservation and Efficiency** 13 **Measures?**

14 BC Hydro was not able to discern a measurable impact in customer conservation
15 and efficiency measures arising from the Freshet Rate. That is, there was no
16 evidence that the Pilot impacted the customer’s views or decision-making in respect
17 of such measures. However, as part of its internal rate assessment, BC Hydro did
18 identify that the current process and methodology for engineering review of annual
19 energy savings may need to be refined in future on a customer-by-customer basis.
20 The purpose of this refinement would be to consider how incremental volumes of
21 seasonal non-firm energy (including RS 1892 and RS 1880 energy) might be
22 separated from total metered energy for the purpose of annual energy savings
23 determination under RS 1823 and Tariff Supplement No. 74 (Customer Baseline
24 Load Determination Guidelines).

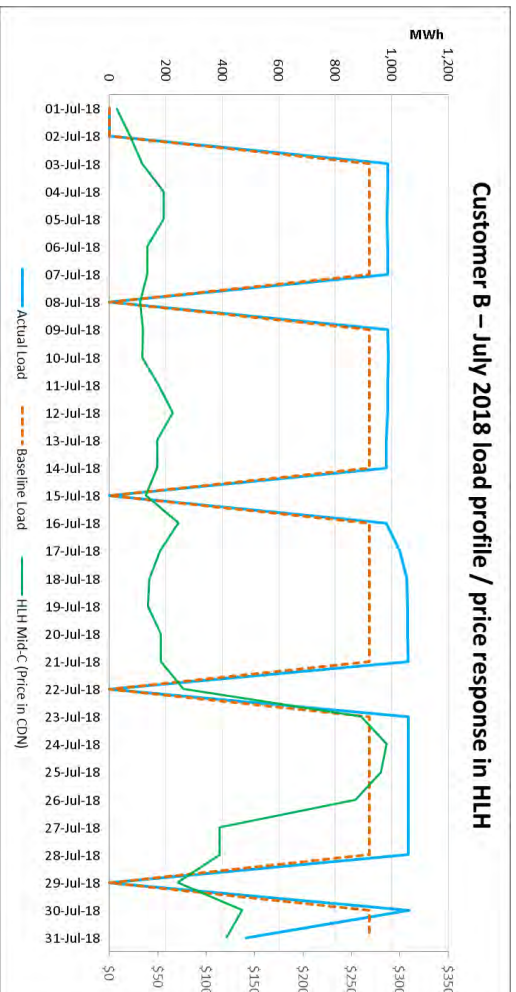
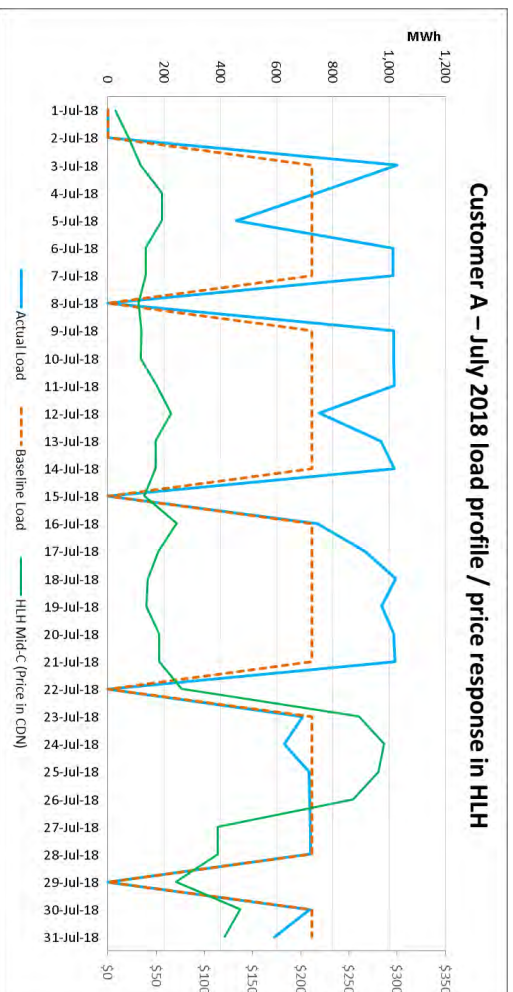
1 **3.4.9 How Quickly did Customers Respond to Changes in Market Prices?**

2 Participating RS 1892 customers had advance knowledge of day-ahead market
3 prices for both HLH and LLH. This provided them with the discretion to increase
4 electricity use for any of the 92 days in the Freshet Period when economic to do so.
5 Participant customers typically operated their facilities to optimize electricity costs
6 such that incremental electricity use was highest when market prices were low.

7 In terms of speed of customer response, some customers advised that they closely
8 monitored daily market prices to make daily operating decisions. Others advised that
9 daily pricing did not influence their operating decisions either because they: (a) were
10 not actively monitoring daily market prices; or (b) had already made an advance
11 commitment to higher operating levels and sales with an expectation of average
12 lower prices over the period. In summary, this information suggests that some
13 customers responded on a day-to-day basis, while others responded less quickly or
14 not at all.

15 The following examples illustrate the different response of two customers to a
16 sudden spike in Mid-C prices in the last ten days of July 2018. The price spike was
17 associated with a heat wave in the Pacific Northwest whereby Mid-C prices in HLH
18 increased from C\$50/MWh to almost C\$300/MWh.

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- 3 • Customer A used a specific daily price target for incremental load. They
- 4 reduced load to, or below, the energy baseline on high market-priced days.
- 5 • Customer B ran right through the high market-priced event. This is because
- 6 they had a contractual commitment to deliver incremental product. Even with
- 7 the ten-day period of high July pricing, the average HLH energy price paid over

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1 the entire freshet season of \$34.50/MWh (refer to [Table 15](#)) was still below the
2 RS 1823 Tier 1 energy price of \$44.20/MWh.

3 **3.4.10 Did Customers with Aggregated RS 1823 Loads Shift Consumption**
4 **between Plants to take Advantage of this Rate?**

5 BC Hydro saw no evidence of load shifting between plants for customers with
6 aggregated operating plants under RS1823. BC Hydro was advised by certain
7 customers with operations in jurisdictions outside of British Columbia that they made
8 the decision to consume incremental energy under RS 1892 based on a lower
9 marginal cost of production (i.e., they shifted production and load to BC Hydro's
10 service territory from other jurisdictions in which they operate).

11 **3.4.11 Did BC Hydro Curtail any Customers under the Non-firm Provisions**
12 **of this Rate? If so, what Led to the Curtailments? If not, were there**
13 **any Financial Impacts to BC Hydro?**

14 No, BC Hydro did not curtail RS 1892 service during any Year of the Pilot. Sufficient
15 energy and capacity was available at all times to serve the incremental load. There
16 were no negative financial impacts to BC Hydro from not curtailing customers.

17 **3.4.12 Was there any Impact on RS 1880 Events? Did Customers use the**
18 **Rate as a Substitute for RS 1880?**

19 For each year of the Pilot, BC Hydro identified all participant customers with
20 self-generation facilities. Generation and load metering data was reviewed in
21 consultation with the customer where applicable. The purpose was to determine the
22 nature of any reduction in self-generation that may have caused an increase in
23 RS 1892 energy purchases. BC Hydro considers that, during events of forced
24 generator outage, incremental electricity would have been purchased under
25 RS 1880, but for the existence of RS 1892. Accordingly, the Freshet Rate acted as a
26 non-firm service alternative to RS 1880. Refer also to sections [3.1.7](#) and [3.4.5](#).

4 Customer and Stakeholder Engagement

4.1 Engagement Summary

The Freshet Rate was approved by the Commission in February 2016. Since that time, BC Hydro has conducted broad, province-wide engagement with RS 1823 customers, industry and stakeholders. Engagement activities include the following:

- Annual province-wide customer engagement workshops;³⁵
- Annual participant customer surveys;³⁶
- Individual customer meetings;
- Association of Major Power Customer (**AMPC**) meetings; and
- Stakeholder workshops on October 11th and November 19th 2018.

The purpose of these engagements was to: (a) provide information about the rate; (b) encourage customer participation; and (c) seek feedback regarding various aspects of the Pilot including rate design criteria, terms and conditions and the possibility of making the rate permanent.

4.1.1 Key Themes

In summary, BC Hydro considers that customer and industry engagement for the Pilot has been broad and deep. The over-arching themes of verbal and written feedback received over a three year period are as follows:

1. Participant customers from a diverse cross-section of industry and AMPC have confirmed their satisfaction with the Freshet Rate and wish it to continue. They view it as an opportunity to optimize plant capacity and self-generation and produce additional product at lower cost.

³⁵ Customer workshops were held in February 2016, February 2017, November 2017 and October/November 2018.

³⁶ Sent in September of each year to participant customers (i.e., September 2016, 2017 and 2018) after Freshet Rate billing was completed.

- 1 2. Although there is clear support for the Freshet Rate to continue, some
2 participant customers have been equally clear that they would prefer: (a)
3 monthly settlement of net RS 1892 energy rather than the current seasonal
4 billing methodology; and (b) for the month of July to be replaced with April.
5 Their general concern is that efforts to increase load in May and June when
6 market prices were lower have been diluted by load reductions in July when
7 market prices were higher. Based on historical Mid-C prices, April would be a
8 lower-priced month than July for the purpose of driving incremental load.
- 9 3. Intervener support for the rate is varied, as illustrated by the selection of written
10 comments shown below. BC Hydro recognizes that some interveners have had
11 only limited experience with, and/or exposure to, the Freshet Rate.³⁷
- 12 ▪ **AMPC:** *“The program is a win-win-win for BC Hydro, industrial customers,*
13 *and other rate classes. All parties are better off than if the same power*
14 *were exported.”*
 - 15 ▪ **BCSEA:** *“The Freshet Rate supports low-carbon electrification by putting*
16 *downward pressure on BCH rates due to net revenue from incremental*
17 *load from Freshet Rate participants that is not shifted from load paid for at*
18 *full tariff rates.”*
 - 19 ▪ **CAPP:** *“CAPP members cannot leverage the benefits of the freshet and*
20 *incremental energy rate, accordingly CAPP has no position on either of*
21 *these rates.”*
 - 22 ▪ **MOVEUP:** *“The freshet rate is an awful lot of process for a very small*
23 *program.”*

³⁷ Feedback from interveners is limited to the recent October/November 2018 stakeholder engagement workshops.

1 **4.2 Feedback Regarding Extension/Permanence of Freshet Rate**

2 Customer and industry feedback regarding whether the rate should continue is
3 summarized in this section. The survey results shown in the charts are based on
4 written feedback from the October 2018 workshops only.³⁸ For context, BC Hydro
5 has also included a selection of written comments by participant customers to
6 annual survey questions and from customers and stakeholders at BC Hydro's
7 October 2018 workshop. Refer to Attachment 3 for a description of the specific
8 questions to which BC Hydro sought feedback.

9 **4.2.1 Participant Customer Feedback from Annual Surveys**

10 **Solid wood:**

- 11 • *"If the pilot were to become a permanent program, it would allow us to take a*
12 *longer term strategic approach, which could uncover additional opportunities."*
- 13 • *"If the freshet program was to continue, we would consider the possibility of*
14 *adding production (extended shifts). This consideration for additional production*
15 *would hinge on several factors including market conditions, log/lumber*
16 *inventory levels etc., however the freshet rate would certainly be an additional*
17 *incentive that could be a key component."*
- 18 • *"If the pilot were to become a permanent program, it would allow us to take a*
19 *longer term strategic approach, which could uncover additional opportunities.*
20 *We would also suggest that if there was an opportunity to extend the freshet*
21 *period beyond May 1 – July 31 that would be beneficial from our perspective".*
- 22 • *"If this were a permanent program ... a case could be made to take a serious*
23 *internal look at opportunities to increase load in these periods while adding*
24 *production or operational benefits ... I don't know how much true incremental*
25 *load could be consumed without capital investment and strategic planning."*

³⁸ Since attendees at the October workshops included participant customers, non-participant customers and intervener groups, BC Hydro considers this feedback to be broadly representative of multiple interests.

Mining:

- 1 • *“The freshet rate program has been beneficial to us and we support making it*
- 2 *permanent.”*
- 3
- 4 • *“Our company might look into the feasibility of taking better advantage of day*
- 5 *ahead market pricing as our production schedule is currently planned for a*
- 6 *week in advance.”*
- 7 • *“If the rate were to be permanent, we would invest in capital that would take*
- 8 *advantage of the rate benefit such as turnkey electric power replacements for*
- 9 *mining vehicles, take advantage of related energy efficiencies (ventilation,*
- 10 *electric motors, etc.)”*
- 11 • *“If the Freshet Rate was made permanent we could undertake engineering*
- 12 *studies to determine how we could possible batch some operations. Possibly*
- 13 *further electrification and conversion of diesel fueled equipment.”*

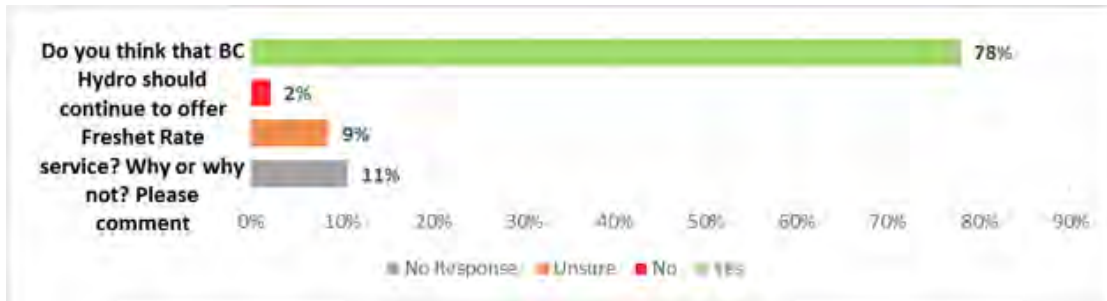
Electrochemical:

- 14 • *“If the Freshet Rate were to be made permanent, we would ratchet up*
- 15 *production to full capacity. We currently have about 60 GWh of energy that is*
- 16 *not utilized.”*
- 17
- 18 • *We strongly believe that the Freshet Energy Pilot has been a win-win-win*
- 19 *program for customers, BC Hydro and other rate-payers ... we support an*
- 20 *extension of the Pilot for Year 3 and advocate that the program be made*
- 21 *permanent going forward.*
- 22 • *“We urge BC Hydro to consider expanding the Freshet rate concept to provide*
- 23 *a market-based rate for incremental production over a full 12-month period. A*
- 24 *year-round market-based rate would allow customers to acquire competitively*
- 25 *priced electricity and increase production whilst also increasing electricity sales*
- 26 *for BC Hydro.”*

Pulp and Paper:

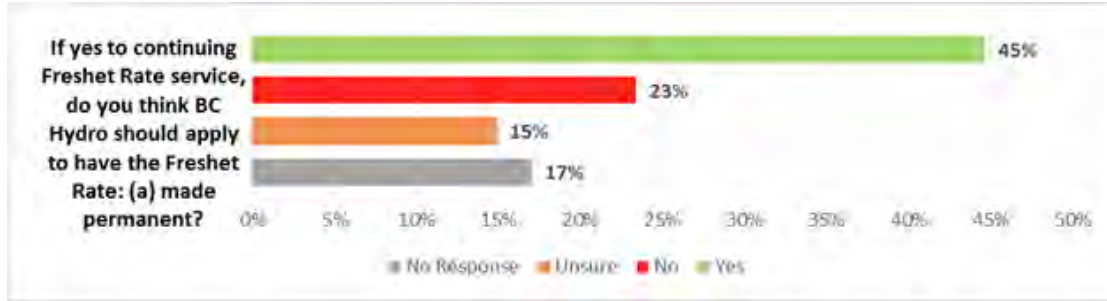
- 1 • *“If the Freshet Rate was made permanent we would consider making capital*
- 2 *investments or permanent changes to use incremental electricity.”*
- 3
- 4 • *We believe that the experience from the first 2 years of the Freshet program*
- 5 *has focused our company and employees on looking at alternatives to how we*
- 6 *normally schedule our production and inventory balance throughout the year*
- 7 • *“Through capital expenditure we could potentially increase load at a facility that*
- 8 *is paper machine constrained and generate incremental pulp that can be used*
- 9 *elsewhere. With standard power pricing, this incremental pulp generation may*
- 10 *not be economical to use at other facilities, but if we had incremental electricity*
- 11 *pricing for that incremental pulp production, perhaps we could economically*
- 12 *transport that pulp to other facilities for conversion. However, limiting the Rate*
- 13 *to 3 months a year also limits the opportunity for investment. Extending the*
- 14 *window under which the Rate applies increases the potential for incremental*
- 15 *purchases and increased production to justify the investment. The market*
- 16 *pricing mechanism will send the appropriate signal to the customer and the*
- 17 *interaction between the Rate and RS1823 protects the other rate payers.”*

1 **4.2.2 Feedback from October 2018 Workshops**



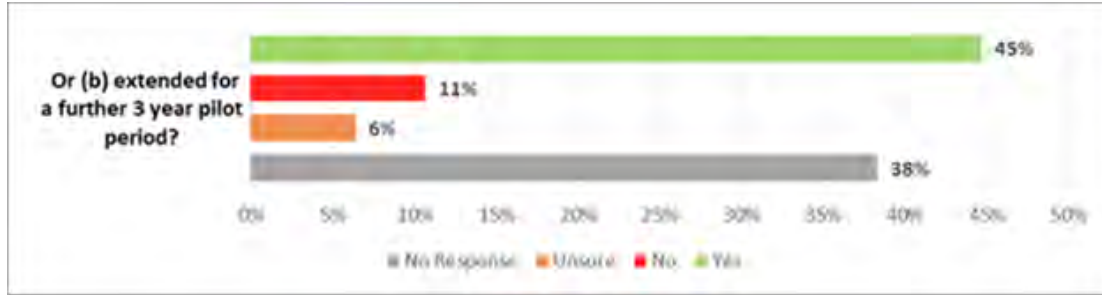
Additional written comments	Location
It is good to have an option vs not - but the rate differential is not enough to push the investment that it would take for us to fully participate. Customers need protection from rates above RS 1823	Kamloops
Keeps option open for future	Kamloops
To effectively utilize the surplus in the province of B.C. where possible	Kamloops
Allows for partial opportunities for any industry to take advantage of operational change that may not have been possible under normal rate circumstances	Kamloops
Good reservoir management incentive	Prince George
Mutual benefits to BC Hydro and customers while adding GDP	Prince George
It is one way to lower the cost for power	Vancouver
The Freshet Rate encourages more consumption. The 3-year pilot has demonstrated benefits to all parties.	Vancouver
There are economic benefits of the Freshet Rate	Vancouver
Win-win for BC Hydro with increased revenue and availability of low-cost power to customers	Vancouver
Calculate the rate impact on an hourly and /or daily basis instead of a monthly basis	Vancouver
The Freshet Rate supports low-carbon electrification by putting downward pressure on BC Hydro's rates due to net revenue from incremental load from Freshet Rate participants that is not shifted from load paid for at full tariff rates.	
There is a huge opportunity to create new jobs and economic opportunity in the block chain and artificial intelligence industries	Vancouver
Provide financial benefit to both BC Hydro and participants in the Freshet Rate	Vancouver
Freshet Rate is a useful option to have	Vancouver
The net benefit to rate payers seems limited	Vancouver

Additional written comments	Location
Use it or lose it. It makes sense, although my organization does not benefit.	Vancouver
Change the Freshet Rate to be a year-long rate	Vancouver
It's very confusing and not worth the effort just use a flat lower rate	Vancouver
Freshet Rate can encourage load growth	Vancouver
Yes	Vancouver
I think benefits of availing Freshet rates need to be well explained to bulk consumers for their appreciation and to join in	Vancouver
Our facility has no opportunity to take advantage of the Fresh Rate service	Vancouver
We need predictable annualized EDR (Economic Development Rate)	Vancouver
The Freshet rate allows for BC Hydro to cover its costs with domestic consumption when BC Hydro has excess power	Vancouver
Any form of cost savings is invited. If it is tested and proven for the past years then why not?	Vancouver



Additional written comments	Location
Keep tweaking	Kamloops
Can plan future projects around capacity changes	Prince George
Either permanent or extension is fine but I would support the one that gives BC Hydro the best chance of success with the BCUC	Prince George
Calculate the Freshet Rate impact on an hourly and /or daily basis instead of a monthly basis	Vancouver
The program is a win-win-win for BC Hydro, industrial customers, and other rate classes. All parties are better off than if the same power were exported.	
Yes, make Freshet Rate permanent	Vancouver
With declining industrial industry this rate is paramount to make BC businesses competitive globally. This important for both preservation and creation of BC jobs	Vancouver
Penalizes firms going for efficiency project that can lower their baseline	Vancouver
Haven't used Freshet Rate before	Vancouver
We are cautious about making the Freshet Rate permanent because of (a) uncertainty about what happens when BC Hydro has a deficit load resource balance and (b) uncertainty about the possibility of load shifting creeping in over time	Vancouver
I think long term forecasts are too uncertain (climate, US market, Alberta market) to understand a surplus situation going forward	Vancouver
If you mean permanent annual- then Yes	Vancouver
With more certainty on the longevity of the rate some load customers may choose to invest in capital that would allow them to better monetize the increased capacity at lower rates which will benefit all BC Hydro customers	Vancouver
Only once it is permanent can we start looking at investments to optimize our operations with the Freshet Rate	Vancouver

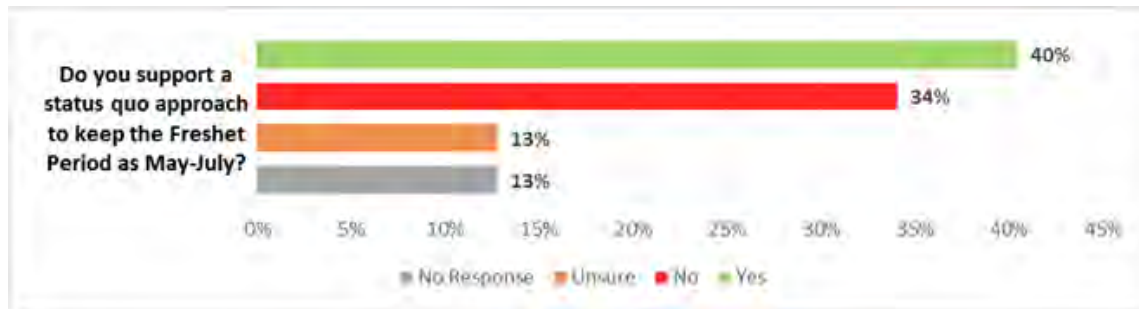
Additional written comments	Location
Yes BC Hydro will continue to have excess power for the years to come. The effect is that those that commit to consuming the excess, should do so at a variable or less	Vancouver
Define permanent. With climate change we may not have a benefit of over storage or markets could react negatively (re: price)	Vancouver



Additional comments	Location
Support extending for a further pilot if there isn't an option of a permanent rate at this time	Kamloops
BC Hydro needs to address the price risk to the customer	Kamloops
As mentioned during workshop, it is useful to mitigate risk	Kamloops
Not sure 3 years are required to test an April-June program and monthly billing	Vancouver
The Freshet Rate as a pilot is apparently working well and should be continued as a pilot	Vancouver
I would prefer this be a short-term annually assessed net benefit and rate application with the regulator	Vancouver
A further pilot would create uncertainty and potentially detract customers and BC Hydro from investing resources in managing a program that is projected to last for the duration of the current energy surplus i.e. well beyond 3 years	Vancouver
Need long-term predictable supply	Vancouver
A pilot extension lacks certainty for customers	Vancouver
If incorporated into an annual freshet period	Vancouver

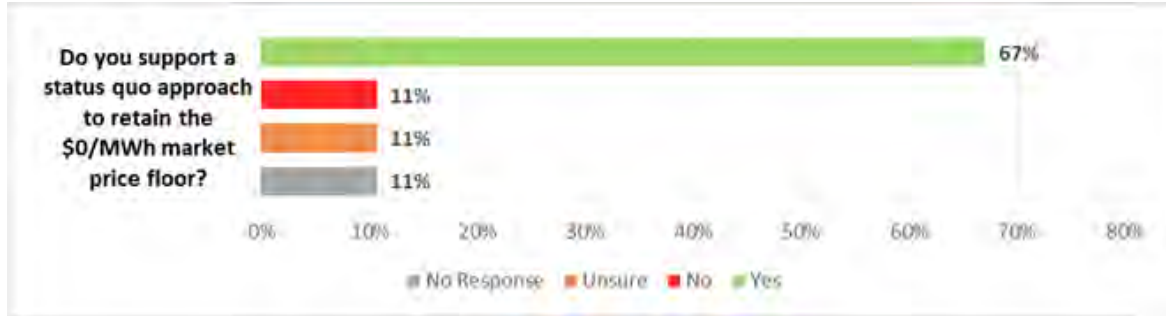
1 **4.3 Feedback Regarding Rate Design Criteria**

2 Customer and industry feedback regarding prospective changes and/or
3 modifications to existing rate design criteria are described in this section. As
4 described above, the survey results in the charts are based on written feedback from
5 the October 2018 workshops only. For context, BC Hydro has also included written
6 comments from workshop attendees that completed a written feedback form.

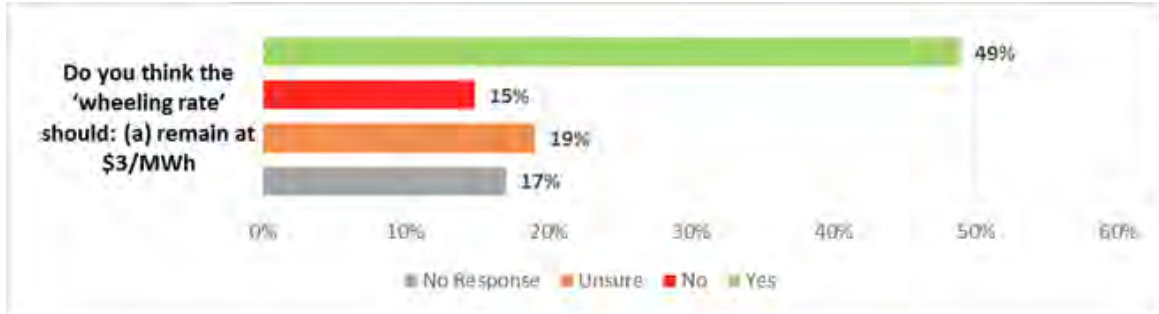


Additional comments	Location
Pricing in July has been too high. better to go April - June	Calgary
With rate protection to ensure win-win for BC Hydro and customer	Kamloops
Longer would be better	Kamloops
NO: Would support and annual program	Prince George
July Mid-C prices are too high; could pilot April-June, or just May-June	Prince George
2 Parts: 1) this would be worth extending the period 2) Does Freshet Rate period need to be a full month i.e. could the rate go from May 01 to July 15 (and avoid the last part of July)?	Vancouver
AMPC supports adjusting the period forward to avoid the July period	Vancouver
There should be a consideration to increase this period in order to attract firm power consumers	Vancouver
The Freshet Period should be determined according to the hydrology data. BC Hydro said during the workshop that the hydrology data continues to support May-July	Vancouver
Looks like the Freshet period during the pilot starts earlier than May	Vancouver
You have 3 years of proven results. No need to change	Vancouver
Perhaps the findings should be considered and the Freshet period moved back a month	Vancouver
We need an annual rate	Vancouver

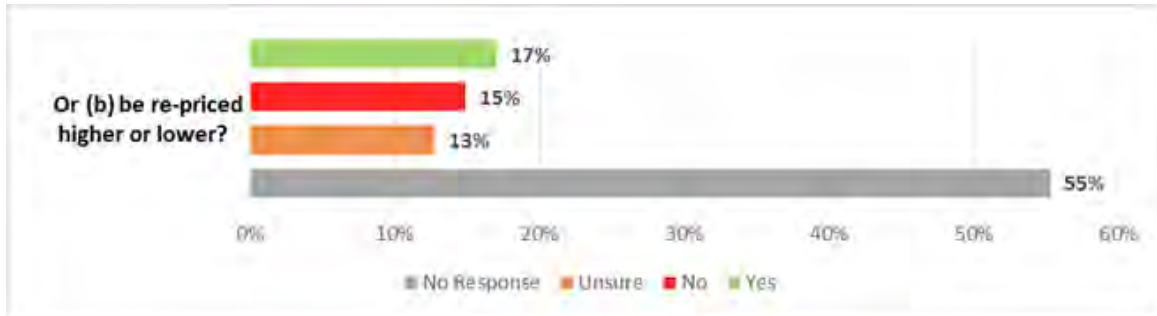
Additional comments	Location
Looks like the Freshet period during the pilot started earlier than May. Perhaps the findings should be considered for a Freshet period to be moved back a month	Vancouver
It does not seem to align well with price opportunity. Consider adding April to reflect lower market prices and BC Hydro is likely long during that period, especially if the energy determination is done monthly	Vancouver
Inclusion of July, with its high-risk exposure to high prices is a significant disincentive for customer participation. April-June makes more sense	Vancouver
Please change to year long	Vancouver
I support full year rate duration to large consumers	Vancouver
But this should be re-assessed as the climate changes and market peaks charge	Vancouver



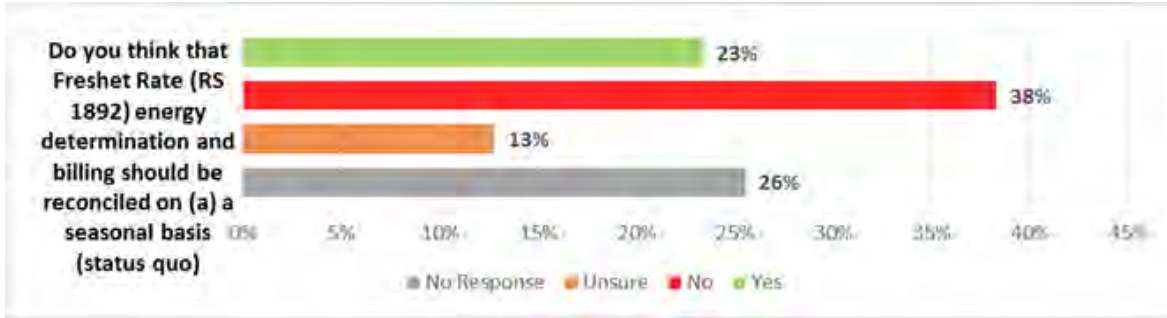
Additional comments	Location
If there is also a price cap at the Tariff rate	Kamloops
Allow some negative pricing to reflect value to BC Hydro to not spill or raise water flows to rivers (cost avoidance, maintenance, regularity, etc.)	Prince George
There is no limit on high prices. Therefore why limit the low prices	Prince George
If there is no cap on the ceiling, there should be no cap on the floor	Vancouver
We understand that BC Hydro recommends retaining the \$0/MWh market price floor because when the market price is negative BC Hydro can, if necessary, spill without cost.	Vancouver
AMPC recognizes that BC Hydro will spill rather than export into a negative pricing environment. Otherwise, given the wheeling fee, removing the floor would be principled and fair.	Vancouver
Having a floor at \$0/MWh while not providing an equivalent ceiling for customers, creates significant downside risk for customers. It is commercially inequitable on principle and creates a barrier for participation. The lack of a ceiling further erodes any customer incentive through the ratio mechanism where a customer effectively reduces any benefit during a period of low pricing because they need to reduce their load to protect themselves from a period of extreme pricing.	Vancouver
This will help business lower power costs on an annualized basis which will help keep BC businesses remain competitive	Vancouver
If companies take on the risk, they should get the full benefit	Vancouver
Increase the wheeling fee	Vancouver
Power should not be sold at a loss	Vancouver
Makes sense if you include a price cap	Vancouver



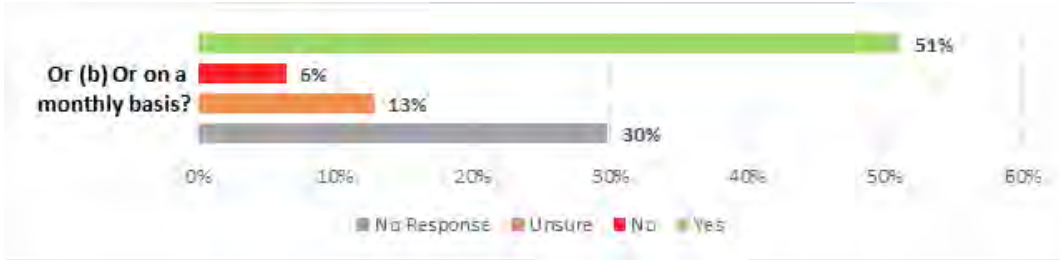
Additional comments	Location
The wheeling rate should reflect actual - that's fair	Kamloops
Wheeling rate should be lower, customers and BC Hydro still better off when customers taking power, even if wheeling charge is lower	Prince George
Unless market price is below zero	Prince George
Needs to be lowered	Vancouver
We understand that the size of the virtual wheeling rate is based on about half of the BPA wheeling charge. There doesn't appear to be any particular reason to change it.	Vancouver
I'd prefer \$0/MWh	Vancouver
Should cost \$0/MWh. There is no wheeling cost for BC Hydro	Vancouver
This should be based on actual cost of delivery based on each site	Vancouver



Additional comments	Location
Review. The premise of Freshet is excess water (i.e.) export of energy. Should a customer's billed wheeling fee be calculated to include import of energy proportional to actual historical?	Kamloops
Low covering costs is best. Don't use this as a revenue stream	Prince George
Should be repriced lower	Prince George
Should be re-priced lower; customers and BC Hydro still better off when customers taking power, even if lower wheeling charge	Vancouver
I think considerations should be made to reduce this rate to attract new industry and jobs!	Vancouver
Price lower since it is hard to mitigate BC Hydro risks; participants don't have this insurance	Vancouver
"Higher" if the Mid-C rate stays high in future	Vancouver
To match general rate increase percentage	Vancouver
The wheeling rate should be evaluated in conjunction with a review of the floor and ceiling to provide the appropriate signal for incremental consumption	Vancouver
Should be repriced	Vancouver



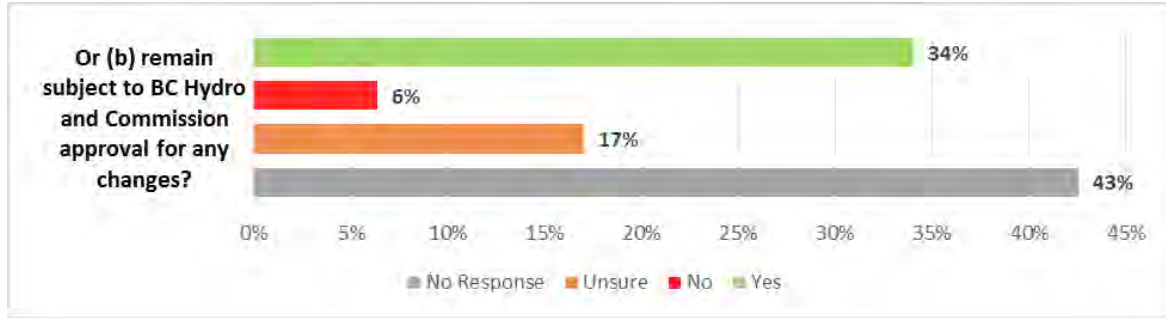
Additional comments	Location
It is easier to maintain value of change on per month basis than over a season	Kamloops
We are unsure whether monthly reconciliation would increase the possibility of load shifting.	Vancouver
This is an incredibly complex measure no other jurisdiction we operate in requires this level of complexity	Vancouver



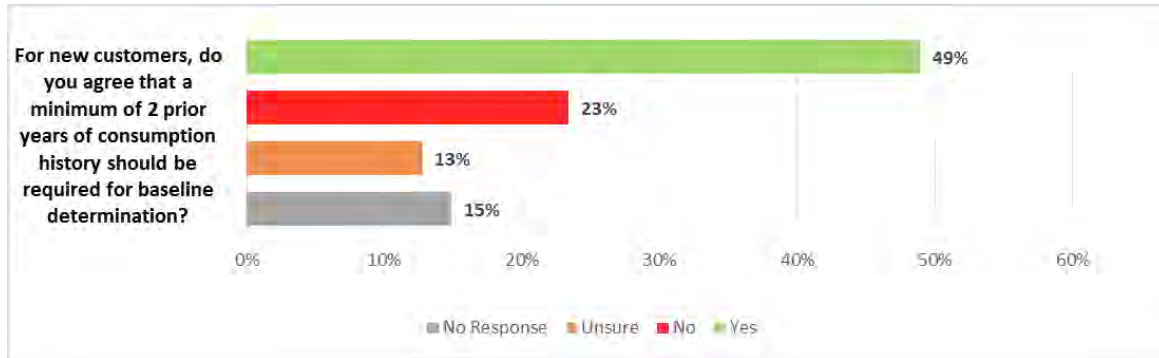
Additional comments	Location
Monthly settlement simplifies it	Prince George
Monthly settlement is simpler for financial reporting	Vancouver
We would prefer settlement on a daily basis	Vancouver
Better transparency due to ratio.	Vancouver
Monthly settlement would improve customer participation. The risk and complexity of the seasonal mechanism makes production decisions difficult to make and can retroactively destroy any benefits realized early in the season. Moreover, the mechanisms in TS 74 already provide protection against load shifting in the form of the CBL reset risk. Our company may not be able to participate in a Freshet Rate season with seasonal reconciliation given the changing climate that may present more frequent heat waves in July that has driven up the Mid-C daily pricing in every year of the pilot	Vancouver
Seasonal reconciliation removes the incentive to make use of Freshet Rate e.g. industrial customers experience with July 'peaks'	
No need to increase the frequency of reconciliation.	Vancouver
Allow loads to optimize based on their seasonal constraints and market pricing, particularly if the season is maintained as status quo	Vancouver
Prompt billing is essential for understanding benefit to the business. Minimum monthly settlement	Vancouver



Additional comments	Location
Certain types of circumstances/events should just result in automatic adjustment	Prince George
Baselines should be adjusted similar to TS 74 and subject to BCUC approval.	Vancouver
It is likely more efficient to adopt the principles that have developed in TS 74 which includes a blend of automatic and BCUC oversight issues	Vancouver
Sometimes outages that are planned have to be shifted and that might fall into the Freshet period so a provision adjustment would make more sense	Vancouver
Based on length of time for BCUC decisions	Vancouver



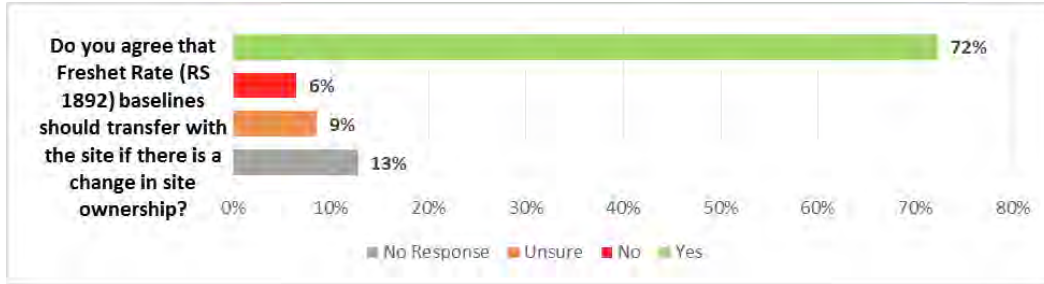
Additional comments	Location
It depends on circumstance	Prince George
It is more likely more efficient to adopt the principles that have developed in TS 74 which includes a blend of automatic and BCUC oversight issues. AMPC prefers a design that minimizes CBL fine-tuning and discussion	Vancouver
Firms should have the option to run their analysis at all times	Vancouver
For now, we would prefer to have a longer period for which potential load shifting has been evaluated before automatic baseline adjustments are implemented therefore would prefer BCUC approval	Vancouver
BCUC approval is the preferred mechanism to keep the process transparent and equitable for all customers and rate classes	Vancouver
BC Hydro needs to consider unintended load decreases (i.e. outages at facilities)	Vancouver



Additional comments	Location
Determination should be one-year	Calgary
Depends on individual plant, market conditions, product availability, energy supply, options may all affect operations	Kamloops
One year is acceptable	Kamloops
One year could represent an acceptable baseline. Is this dependent on the industry or type of customer?	Prince George
New startups have lower use so 2 years (using higher) is a minimum	Prince George
The pilot was for 3 years. Why not 3 prior years?	Vancouver
This will force potential clients to look elsewhere versus BC	Vancouver
It should be firm specific and based on the nature of operations and its trend	Vancouver
As we are increasing power consumption from former Mill Site ownership we would expect to be treated as significant power consumers	Vancouver
If a customer is on RS1823A that is already good for BC Hydro since that customer is paying the higher blended rate. If they already have a CBL, the reset mechanism protects against any gaming. If we are trying to encourage new load we should remove as many barriers as possible	Vancouver
We understand that 2 years is a reduction from the current 3 years and that BC Hydro believes 2 years is sufficient.	Vancouver
Allow new loads to participate by using engineering estimates of what the load will be during that period. This will be particularly important if those new loads have to make capital decisions during the construction phase to take advantage of the Freshet Rate	Vancouver
I believe that if a company spends the infrastructure Capex to support consumption above a minimum threshold, that one year baseline is acceptable to start. If consumption changes then move to a two year average to set new consumption rate	Vancouver

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Additional comments	Location
We should make it as easy as possible to enter	Vancouver
Not now	Vancouver



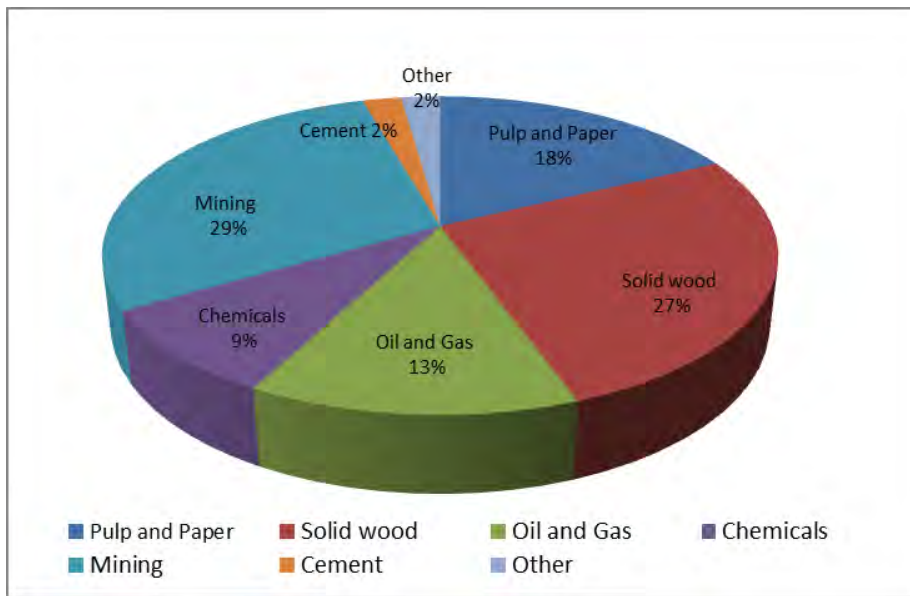
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I believe that if a company spends the infrastructure Capex to support consumption above a minimum threshold, that one year baseline is acceptable to start. If consumption changes then move to a two year average to set new consumption rate	Vancouver
We should make it as easy as possible to enter	Vancouver
Not now	Vancouver

5 Year 3 Results and Year 2 Load Shifting Analysis

5.1 Customer Participation

Forty seven³⁹ unique transmission customer sites from across the province participated in Year 3 of the Pilot. This reflects an increase from 44 participating sites in Year 2 and includes four sites for which Year 3 was their first year of participation. Two sites which had participated in prior years (one site from Year 1 and one site from Year 2) did not participate in Year 3. Overall, this level of participation reflects approximately 32 per cent of eligible sites in the entire RS 1823 customer class. Customer participants represented a broad cross-section of industry sectors as shown in the chart below.

Figure 14 Customer Participation by Industry Sector (Year 3)



BC Hydro considers that customer participation for Year 3 was successful. Similar to the feedback provided for Year 2 and Year 3, customer feedback for Year 3 indicated that the sign up process for the Pilot was straight forward and that the ‘opt

³⁹ Two customers subsequently opted out of Year 3.

1 out' provision of the rate (i.e., ability to cancel supply at any time prior to July 31 in
2 accordance with Special Condition 6 of RS 1892) helped to de-risk their participation.

3 **5.2 Baseline Review and Adjustment**

4 Each of the 47 participant customer sites had electricity baselines (i.e., HLH
5 Baseline, LLH Baseline and Reference Demand) determined in accordance with
6 RS 1892. The purpose of the customer specific electricity baselines is to separate
7 incremental RS 1892 electricity purchases from RS 1823 electricity purchases
8 during the 2018 Freshet Period.

9 For Year 3, five customer sites had baselines that required adjustment pursuant to
10 Special Condition 4 of RS 1892. BC Hydro filed the agreed to baseline adjustments
11 with the Commission for review as described below. The adjusted baselines were
12 approved by Commission Order No. G-94-18 on May 17, 2018.

13 **5.2.1 Overview of Year 3 Baseline Adjustments**

14 On April 19, 2018, BC Hydro filed five adjusted electricity baselines with the
15 Commission pursuant to Special Condition 4 of RS 1892. Four of the customer sites
16 are new participants for Year 3 of the Freshet Rate pilot; one of the customer sites
17 participated in both Year 1 and Year 2. BC Hydro's application included evidence:
18 (a) to explain why the standard baselines calculated in accordance with the
19 provisions of RS 1892 were not considered representative of the customer's
20 expected RS 1823 electricity usage during the Freshet Period of 2018; (b) to
21 describe how the alternative energy baselines and/or Reference Demand were
22 calculated; and (c) to confirm the customer's agreement. BC Hydro identified and
23 proposed baseline adjustments in the application for the events which are
24 summarized below:

- 1 • **Customer funded DSM projects (one customer site)** – RS 1892 energy
2 baselines were decreased to remove the verified impact of the customer funded
3 DSM projects.
- 4 • **Change in site ownership (one customer site)** – Due to a change in site
5 ownership in 2017, the default 2015 Freshet Period data was not representative
6 of normal operations by the new owner. RS 1892 Baselines for this site were
7 determined using data from the 2017 Freshet Period.
- 8 • **Change in operations (one customer site)** – Due to operational changes, the
9 2015 Freshet Period data was not representative of normal operations.
10 RS 1892 Baselines for this customer were determined using data from the
11 2017 Freshet Period.
- 12 • **Indefinite shut down (one customer site)** – The site was shut down during
13 2015 such that default 2015 Freshet Period data was not representative of
14 normal operations. RS 1892 Baselines for this customer were determined using
15 data from the 2016 Freshet Period when the site was operational.
- 16 • **New Plant Commissioning Load (one customer site)** – Due to mine
17 commissioning and ramp up activities, the 2015 Freshet Period was not
18 representative of normal site operations. RS 1892 Baselines for this customer
19 were determined using data from the 2016 Freshet Period with the new plant
20 load in operation.

21 Details of each specific adjustment were filed with the Commission on a confidential
22 basis to protect commercially sensitive customer information. The Commission
23 approved the alternative energy baselines and Reference Demands by
24 Order No. G-94-18 dated May 17, 2018. Overall, BC Hydro considers that the
25 baseline determination process was fair, practical, efficient and well understood by
26 customers. No material issues were identified.

1 **5.3 RS 1892 Energy Sales and Revenue**

2 A total of 47 unique customer sites participated in the 2018 Freshet Period. Only
 3 27 of these sites actually purchased energy under RS 1892. Two sites opted out of
 4 the program and the remaining 18 sites purchased less energy than their RS 1892
 5 energy baselines over the entire Freshet Period and thus all of the energy taken by
 6 these customers was supplied under RS 1823. For the 27 sites that purchased
 7 RS 1892 energy during the 2018 Freshet Period, total RS 1892 energy sales and
 8 gross revenue are summarized in [Table 19](#) below.

9 **Table 19 RS 1892 Energy Sales and Gross**
 10 **Revenue**

Total RS 1892 Energy Volume	150,383 MWh
Average Incremental Load	68.1 MW ave.hr (for total of 2,208 hrs)
Total RS 1892 Energy Sales	\$3.5 million ⁴⁰
Total Wheeling Rate Charges	150,383 MWh x \$3.00/MWh = \$0.5 million
5 per cent Rate Rider on RS 1892 Energy Sales and Wheeling Charges	\$0.2 million
RS 1892 Gross Revenue	\$4.2 million (excluding taxes)

11 [Table 20](#) below provides a comparison of the RS 1892 energy sales and gross
 12 revenue for Year 1 and Year 2.

⁴⁰ Reflects an average Mid-C market energy price of CAD \$23.31/MWh.

1
2

Table 20 Comparison of RS 1892 Energy Sales and Gross Revenue Year 1, Year 2 and Year 3

	Year 1	Year 2	Year 3
Number of Participant Sites	39	44	45
RS 1892 energy sales (MWh)	139,064	168,399	150,383
Average incremental load (MW/hr)	63.0	76.3	68.1
Average unit cost of market-priced energy (\$/MWh)	\$21.88	\$19.50	\$23.31
RS 1892 energy revenue (\$ million)	3.0	3.3	3.5
Plus \$3/MWh wheeling rate x energy volume (\$ million)	0.4	0.5	0.5
Plus 5% rate rider (\$ million)	0.2	0.2	0.2
Average total unit cost of market-priced energy excluding taxes (\$/MWh)	26.12	23.63	27.63
Total RS 1892 gross revenue (\$ million)	3.6	4.0	4.2

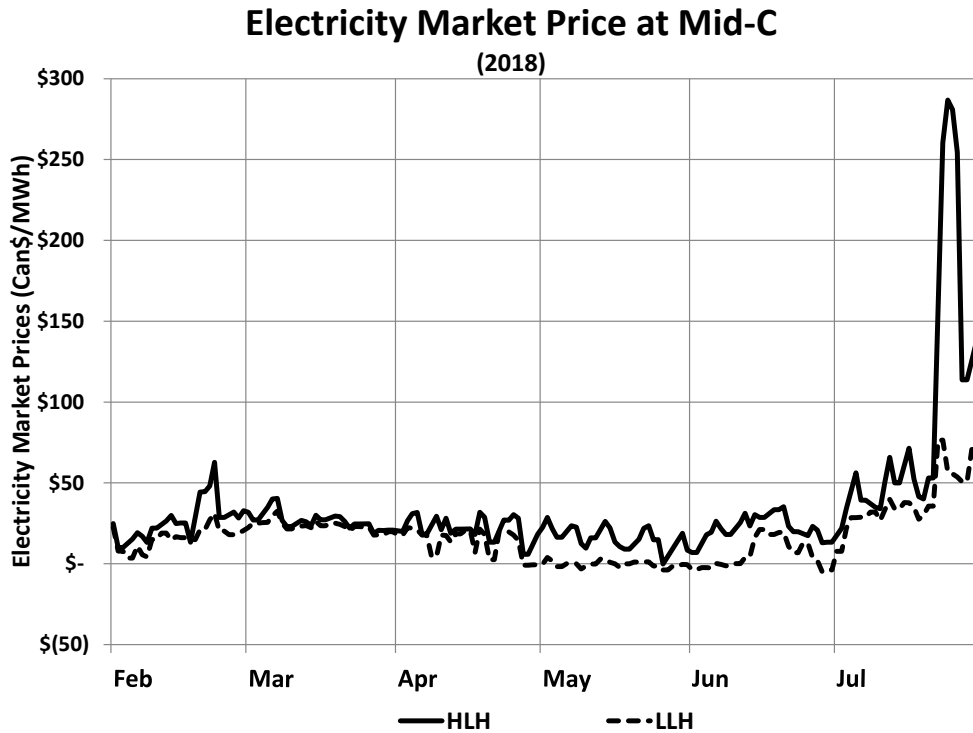
3 In Year 3 compared to Year 2, the table shows that the volume of RS 1892 energy
4 sales was lower (by about 11 per cent), and the average unit cost of market-priced
5 energy was higher (by about 17 per cent). Total RS 1892 gross revenue in both
6 years was roughly equal at \$4.2 million and \$4.0 million respectively.

7 **5.4 Mid-C Market Pricing**

8 The chart below shows the average daily Mid C market energy prices in both HLH
9 and LLH for the 2018 Freshet Period, adjusted using the daily Bank of Canada
10 exchange rate. Daily LLH market prices ranged from CAD \$(4.99)/MWh to
11 \$76.42/MWh and daily HLH market prices ranged from CAD \$(0.23)/MWh to
12 \$286.74/MWh.

1

Figure 15 Electricity Market Prices: Mid-C



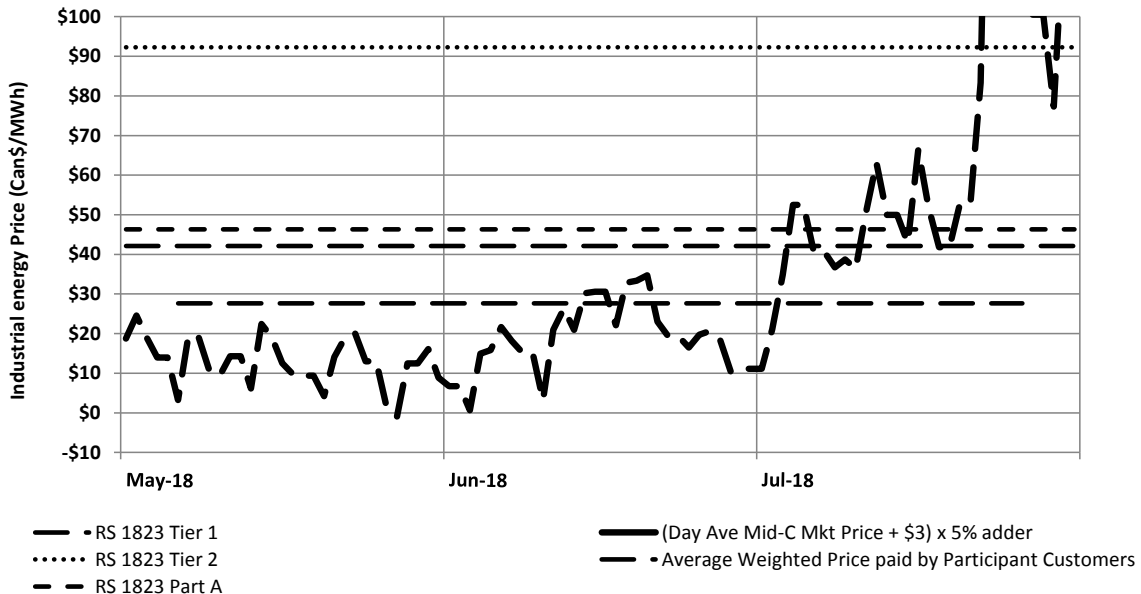
2 For the months of May and June during the 2018 Freshet Period, the average daily
 3 price for RS 1892 energy in HLH and LLH was usually below the otherwise
 4 applicable price(s) for RS 1823 energy. There were a total of 31 days during
 5 the Freshet Period where the market price of LLH energy was negative such that the
 6 energy charge floor price of \$0/MWh under RS 1892 was applied. At no time during
 7 the May-June period was the daily LLH market price higher than the RS 1823 Tier 1
 8 energy price of 41.20/MWh. However, in July, market prices began to rise, resulting
 9 in daily HLH and LLH market prices (in \$CAD) being higher than the RS 1823 Tier 1
 10 energy price of \$41.20/MWh for a significant portion of the month.

1 In Year 3, the average weighted market price paid for RS 1892 energy by participant
2 customers was CAD\$23.31/MWh⁴¹ plus a \$3.00/MWh wheeling rate for a total
3 delivered energy price of CAD \$26.31/MWh before rate rider and taxes. This
4 compares to the RS 1823 Tier 1 energy price of \$41.20/MWh, the RS 1823 Tier 2
5 energy price of \$92.32/MWh and the RS 1823 Part A energy price of \$46.31/MWh
6 (all prices shown before rate rider and taxes).

7 As shown in [Figure 16](#) below, during the 2018 Freshet Period, the average RS 1892
8 market energy price was approximately half of the RS 1823 Tier 1 energy price in
9 May and June, with a major excursion well above the RS1823 Tier 1 price in July.

10
11

Figure 16 Industrial energy prices (May to July 2018)



12 Participating RS 1892 customers had advance knowledge of day-ahead market
13 prices for both HLH and LLH and could choose to use energy under RS 1892 when
14 day-ahead market prices were low relative to RS 1823 energy prices.

⁴¹ The actual price of RS 1892 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Freshet Energy.

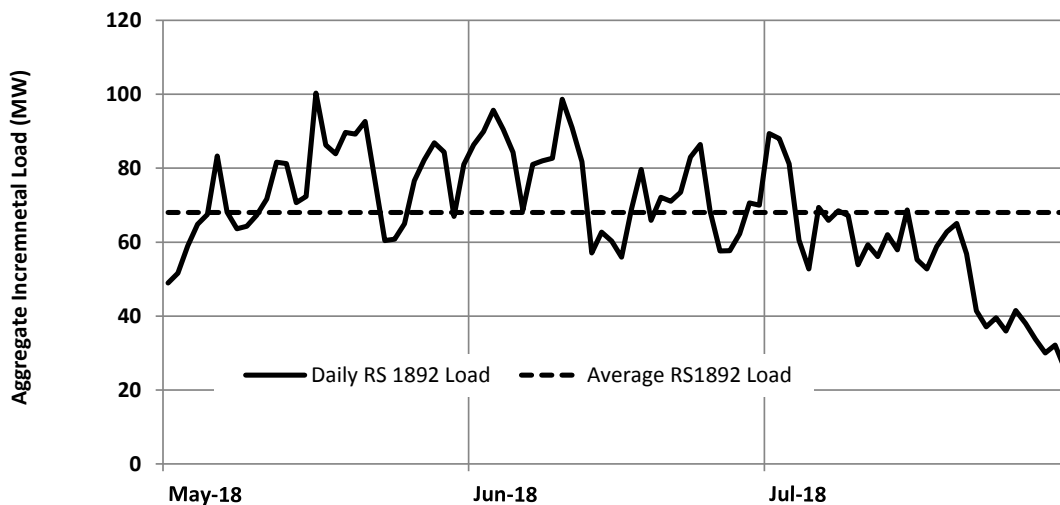
1 Customers also realized demand savings in any Billing Period where actual metered
2 demand was higher than their Reference Demand. Accordingly, it is BC Hydro’s
3 view that the Freshet Rate provided customers with a lower cost option for
4 incremental electricity use.

5 **5.5 Customer Load Response**

6 In general, customers appeared to operate their facilities to optimize electricity costs
7 such that the aggregate load increase was typically highest when market prices
8 were low and vice versa. For example, the highest aggregate load increase was
9 observed in May 2018 when market prices were lowest and the lowest aggregate
10 load increase was observed in July 2018 when market prices were highest.

11 [Figure 17](#) below illustrates the aggregate customer response (load shape) to
12 changes in market prices.

13 **Figure 17 Aggregate incremental RS 1892 load**
14 **(May to July 2018)**



15 In terms of the speed of customer response, some customers advised that they were
16 closely monitoring daily market prices to make daily operating decisions. Refer to
17 sample of customer survey responses below for context:

1 *“The day ahead market pricing formed the basis of freshet*
2 *energy purchases above the HLH and LLH baselines. If the day*
3 *ahead prices exceeded the all in RS 1823 Tier 1 price,*
4 *purchases were reduced to the baselines.”*

5 *“Day ahead market pricing was front and centre on our mill*
6 *information system for key load consumption and power*
7 *generation areas. The day ahead price was compared to our*
8 *internal cost to generate power and was also used in planning*
9 *ahead for load consumption profiling. It set a price threshold*
10 *above which it was not economic to increase loads or curtail*
11 *internal power generation.”*

12 *“The day-ahead price would have to be below RS1823 Tier 2 to*
13 *make it economical for us to buy freshet energy”*

14 Other customers advised that daily pricing did not influence their operating decisions
15 either because they were not actively monitoring daily market prices or had already
16 made an advance commitment to higher operating levels and sales with the
17 expectation of lower average market prices. Refer to sample of customer survey
18 responses below for context:

19 *“We used the day-ahead pricing info to track results not to*
20 *shape actions. It would have been a challenge to reduce load as*
21 *we need to mill ore.”*

22 *“The Mid-C pricing did not influence how we operated once we*
23 *started the freshet period Even if the Mid-C price spiked, we*
24 *would not change our process as we were committed ... higher*
25 *demand charges would have been incurred if we aborted the*
26 *freshet trial due to a spike in Mid-C pricing. So we watched the*
27 *pricing, but did not change the operation of the mill.”*

28 *“We generally didn’t use day to day information, planning was*
29 *done at a monthly level.”*

1 **5.6 Service Considerations**

2 **5.6.1 Interruption**

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

7 **5.6.2 RS 1880 Replacement Service**

8 The RS 1892 service option had an impact on RS 1880 usage. BC Hydro
9 determined that six customers with self-generation facilities took service under
10 RS 1892 during Year 3. However, only one customer site was verified to use
11 RS 1892 as a substitute for RS 1880 during the 2018 Freshet Period due to an event
12 of forced generator outage. BC Hydro considers that the customer would have
13 normally requested RS 1880 service due to forced generator outage, but for the
14 availability of RS 1892. Events of voluntary self-generation curtailment are not
15 relevant to this analysis because they reflect a direct customer action to increase
16 load under RS 1892 (the desired outcome) as opposed to an event of generator
17 outage that would have occurred anyway.

18 **5.7 Financial Considerations**

19 **5.7.1 Wheeling Rate**

20 Directive 4b of Commission Order No. G-17-16 directed BC Hydro as part of its
21 reporting to address and, where appropriate, evaluate the wheeling rate under
22 RS 1892 as compared to FortisBC Inc.'s standby rate. BC Hydro's RS 1892
23 wheeling rate is \$3.00/MWh and FortisBC Inc.'s standby rate is \$4.00/MWh (as
24 shown in Schedule 37 for Large Commercial Standby Service).⁴² The wheeling rate
25 difference is \$1.00/MWh. For Year 3, if the RS 1892 wheeling rate had been

⁴² Schedule 37 can be found in FortisBC Inc's Electric Tariff at
<https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/Documents/FortisBCElectricTariff.pdf>.

1 \$4.00/MWh, this would have provided an additional \$150,383 of wheeling revenue
2 plus an additional \$7,519 of rate rider revenue. This analysis assumes the same
3 total RS 1892 energy volume of 150,383 MWh (i.e., that the higher wheeling rate
4 would have had no impact on customer participation). As provided in the 2015 RDA,
5 BC Hydro remains of the view that the \$3.00 wheeling fee is appropriate.

6 **5.7.2 Incremental Costs**

7 As of November 2018, BC Hydro has incurred approximately \$60,000 in incremental
8 costs specific to Year 3 Pilot implementation. All other staff and administration costs
9 were funded under existing operating budgets.

10 **5.7.3 Ratepayer Impact Analysis**

11 For the 2018 Freshet Period, a daily System Marginal Value was determined for
12 each of BC Hydro's Kinbasket and Williston reservoirs in HLH and LLH:

- 13 • For Kinbasket reservoir, marginal values ranged from CAD \$21 to \$35/MWh;
14 and
- 15 • For Williston reservoir, marginal values ranged from CAD \$22 to \$28/MWh.

16 For any day where basin energy was used to serve RS 1892 loads, the difference
17 between the value of actual RS 1892 energy sales and BC Hydro's System Marginal
18 Value was used to determine the revenue gain or loss on that day.

19 [Table 21](#) shows the estimated ratepayer impact by month for the three marginal
20 resource conditions in \$CAD. For Year 3, the preliminary ratepayer benefit is
21 \$1.87 million.

1 **Table 21** **RS 1892 Monthly Ratepayer Impact by**
 2 **Marginal Resource for Year 3**

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

3 **5.8 Year 2 Load Shifting Analysis**

4 BC Hydro has completed its load shifting analysis for Year 2 and identified the
 5 following four categories as set out below as part of this review:

- 6 • Customer-reported load shift (reduction);
- 7 • Unexplained load variance (reduction or increase);
- 8 • Natural load increase (increase); and
- 9 • RS 1880 replacement service (increase).

10 BC Hydro followed the assessment methodology set out in section [3.1.7](#). Compared
 11 to F2016 (the pre-Freshet Rate baseline period), seven participant customers had
 12 lower RS 1823 energy sales in F2018 and 19 participant customers had higher
 13 RS 1823 energy sales in F2018.

- 14 • For each of the seven customers with lower annual RS 1823 energy purchases,
 15 BC Hydro was able to identify the primary drivers of the RS 1823 energy sales
 16 variance. BC Hydro was not able to discern any “unexplained load variance”
 17 that might be considered to reflect a load shift from non-freshet months.
- 18 • For each of the 19 customers with higher annual RS 1823 energy purchases,
 19 BC Hydro was able to identify the primary drivers of the RS 1823 energy sales
 20 variance for 15 sites. For the other four sites, BC Hydro’s judgement is that the
 21 higher energy purchases are primarily due to natural load growth. BC Hydro

1 considers this load could reasonably be expected to have occurred in the
 2 absence of the Freshet Rate.

- 3 • Further, six customer sites with self-generation facilities took service under
 4 RS 1892 during Year 3. However, only one customer site had a verified event
 5 of forced generator outage.

6 Pursuant to this analysis, BC Hydro is of the view that:

- 7 • There were no instances of customer-reported load shifting;
- 8 • There were no instances of unexplained load variance;
- 9 • There were four instances of natural load increase; and
- 10 • There was one instance of RS 1880 replacement service for forced generator
 11 outage.

12 These consolidated results are shown in [Table 22](#) below.

13 **Table 22** **Verified Volume and Revenue Impact of**
 14 **Load Shift Energy**

Load Shift Category	Customers	Year 2	Year 2
Volume and Revenue Impact	# of sites	MWh	\$
Customer-reported load shift	-	-	\$ -
Unexplained load variance	-	-	\$ -
Natural load increase	4	12,225	\$ (340)
RS 1880 replacement service	1	14,412	\$ (820)
Total		26,637	(1,160)



**Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18**

**Freshet Rate Pilot Final Evaluation Report
Attachment 1**

Preliminary Freshet Rate Report for Year 1



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

January 27, 2017

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)
Transmission Service Freshet Rate
Preliminary Evaluation Report for Year 1 – Appendix D**

BC Hydro attaches Appendix D of the Transmission Service Freshet Rate preliminary evaluation report for year one. This completes the report that was filed by BC Hydro on December 8, 2016.

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

A handwritten signature in purple ink, appearing to be "Fred James", written over a light blue horizontal line.

(for) Fred James
Chief Regulatory Officer

ac/ma

Enclosure (1)



Fred James
Acting Chief Regulatory Officer
Phone: 604-623-4046
Fax: 604-623-4407
bhydroregulatorygroup@bhydro.com

December 8, 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)
Transmission Service Freshet Rate
Preliminary Evaluation Report for Year 1**

BC Hydro attaches the Transmission Service Freshet Rate preliminary evaluation report for year one in compliance with Commission Order No. G-17-16.

BC Hydro will be filing Appendix D of the attached report separately in early January, as it has not been completed yet. Appendix D contains information on the freshet energy surplus.

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bhydroregulatorygroup@bhydro.com.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Fred James", written over a white background.

Fred James
Acting Chief Regulatory Officer

ac/ma

Enclosure



Transmission Service Freshet Rate

Preliminary Evaluation Report for Year 1



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Appendix C	AMPC Feedback Letter
Appendix D	BC Hydro System Conditions during Freshet and Associated Management Strategies



1 Executive Summary

BC Hydro's Freshet Rate (Rate Schedule (RS) 1892) was approved on February 9, 2016 by Commission Order No. G-17-16 for a two-year pilot. The Commission directed BC Hydro to file three evaluation reports to assess whether the rate has met its objectives (i.e., a preliminary evaluation report for each of Year 1 and Year 2, plus a final evaluation report). This first evaluation report is specific to the 2016 Freshet Period (Year 1) and reflects information available as of November 2016.

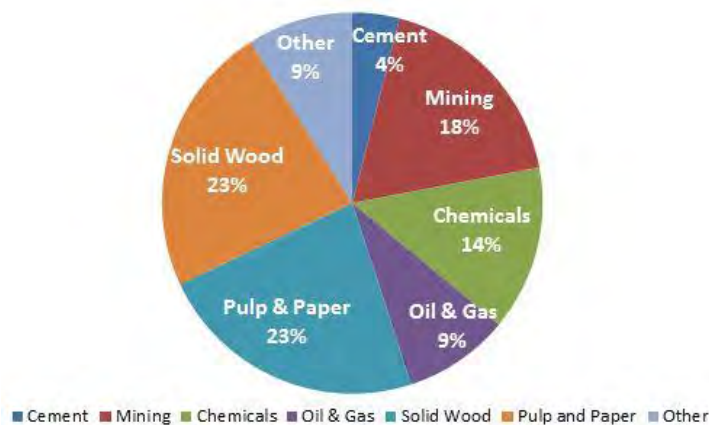
The Freshet Rate is available to existing RS 1823 transmission service customers. It is an optional rate for non-firm service specific to the May 1st to July 31st Freshet Period of 2016 (Year 1) and 2017 (Year 2). Under RS 1892, incremental energy consumption relative to a baseline of expected RS 1823 use is subject to Mid-Columbia (Mid-C) market-based pricing plus a fixed wheeling rate. Since market prices are generally low during the Freshet Period, the rate provides industrial customers with a price signal to increase load.

The rationale for the Freshet Rate is to provide industrial customers with a rate alternative to encourage incremental energy consumption during a period when the BC Hydro system is subject to a seasonal load resource imbalance (energy oversupply). Increased industrial load during the Freshet Period provides BC Hydro with system management flexibility and provides potential economic benefits for participant customers and B.C.

BC Hydro considers that Year 1 of the rate pilot was successful in terms of customer participation, smooth implementation, incremental energy sales and positive ratepayer impact. Customer participants provided feedback that they were satisfied with the rate and viewed it as an opportunity to produce additional volume(s) of product at lower cost.

1.1 Year 1 Participation

Thirty-nine unique transmission customer sites participated in Year 1 of the pilot. This level of participation reflects approximately 26 per cent of eligible sites in the RS 1823 customer class. Customer participants represented key industry sectors from across the province as shown in the chart below.



BC Hydro considers customer participation for Year 1 was successful given the limited time for customer engagement and sign-up following rate approval in mid-February 2016. Customers provided feedback to indicate that the sign-up process for the pilot was straight-forward and the 'opt-out' provision of the rate helped to de-risk their participation.

1.2 Electricity Baseline Determination

Thirty-two participant customer sites had baselines determined in accordance with RS 1892 using unadjusted calendar 2015 data. Seven participant sites had baselines that required adjustment. These were filed with and approved by the Commission. The purpose of the customer-specific electricity baselines is to separate incremental RS 1892 electricity purchases from RS 1823 electricity purchases during the 2016 Freshet Period. BC Hydro considers that the baseline determination process was both well-understood and well-supported by customers.



Specifically, customers provided feedback that the process was clear and the baselines were fair.

1.3 Year 1 Results

Participant customers were billed for RS 1892 electricity in August 2016 to allow for the reconciliation of Net Freshet Energy (i.e., a metered increase in electricity consumption across the entire Freshet Period).

Of the 39 participant customer sites, 26 purchased incremental energy under RS 1892. Incremental energy was determined in High Load Hours (**HLH**) and Low Load Hours (**LLH**) for each day and priced at the day ahead Mid-C peak and off-peak rates, respectively. A fixed \$3.00/MWh wheeling rate was applied to all incremental energy volumes.

RS 1892 electricity sales and gross revenue for the 2016 Freshet Period are summarized below:

- Total RS 1892 energy volume: 139,064 MWh;
- Total RS 1892 energy sales: \$3,460,235;
- Total wheeling charges: 139,064 MWh x \$3.00/MWh = \$417,000;
- 5 per cent Rate Rider on RS 1892 energy sales and wheeling charge: \$194,000; and
- **Gross RS 1892 revenue: \$4.1 million (excluding taxes).**

The average weighted price paid for RS 1892 energy by participant customers was CAD\$24.88/MWh¹ plus a \$3.00/MWh wheeling rate and 5 per cent rate rider, for a total of CAD \$29.28/MWh. This compares to an average weighted price of CAD \$19.52/MWh realized by BC Hydro for market exports.

¹ The actual price of RS 1892 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of Net Freshet Energy.



BC Hydro considers that billing for the 2016 Freshet Period electricity was implemented smoothly. Customer bills were issued in a timely manner. No issues or concerns with monthly invoices or the RS 1892 Billing Statements were identified.

1.4 Customer Actions Taken

Key actions taken by customers to increase load during the 2016 Freshet Period are set out below.

- Higher utilization of existing production capacity;
- Production optimization;
- Operating changes;
- Re-scheduling of maintenance shutdowns into non-freshet months; and
- Generator turndown and curtailment.

As described in section [4](#) of this report, BC Hydro does not yet have sufficient information to verify the energy consumption impact of specific actions taken by customers, including load shifting.

1.5 Ratepayer Impact

BC Hydro has calculated a preliminary Year 1 benefit of approximately \$2.0 million. This benefit remains subject to a number of critical assumptions that will be reviewed as part of BC Hydro's Year 2 report, including the assumption that all RS 1892 energy volumes during the 2016 Freshet Period reflect load that is 'truly incremental'. BC Hydro considers that its rate design principle that all ratepayers should be held harmless by the freshet rate was met for Year 1.



2 Introduction and Background

BC Hydro proposed the freshet rate pilot for transmission service customers in its 2015 Rate Design Application (**2015 RDA**) which was filed with the British Columbia Utilities Commission (**Commission**) on September 25, 2015. On February 9, 2016 by Order No. G-17-16 the Commission approved the freshet rate (RS 1892) for a two-year pilot period.

RS 1892 is an optional rate for incremental service supplied on a non-firm basis during the May 1st to July 31st Freshet Period of 2016 (Year 1) and 2017 (Year 2). RS 1892 is available to transmission service customers taking service under RS 1823 who apply to BC Hydro for it.

The rate provides participating customers with a Mid-C market energy price signal for incremental energy consumption above predetermined HLH and LLH baselines. Since Mid-C market energy prices during freshet periods are typically lower than RS 1823 energy prices, the freshet rate provides an opportunity for participating customers to increase load using market-priced electricity from BC Hydro.

This evaluation report provides preliminary results of the freshet rate pilot covering the 2016 Freshet Period.² The remainder of this section outlines the rationale for the freshet rate and also the scope of the evaluation.

2.1 Freshet Rate Rationale

BC Hydro outlined the following objectives for the freshet rate in the 2015 RDA:

1. Respond to the Industrial Electricity Policy Review (**IEPR**) task force's recommendation to develop additional options for industrial customers;³

² As noted in the cover letter, BC Hydro will file Appendix D of this report separately in early January 2017 and therefore it is not included with this report.

³ The IEPR was announced by the government on January 13, 2013 and a task force was appointed to review industrial electricity policy and regulatory framework. Recommendation 13 of the IEPR task force final report stated "BC Hydro should work with its industrial customers and the Commission to develop options that take advantage of industrial power consumption flexibility".



2. Assist in the management of the freshet oversupply in the BC Hydro system by providing the option to:
 - ▶ Increase the ability to import cheap electricity during low priced periods;
 - ▶ Reduce the volume of surplus energy being forced to export markets; and/or
 - ▶ Reduce spill at BC Hydro facilities.
3. Recover what BC Hydro would otherwise obtain on the export market, but with potential economic benefits for B.C.

2.2 Evaluation Report Scope

Commission Order No. G-17-16 approved the two-year freshet rate pilot program and directed BC Hydro to file the three evaluation reports as described in section 7.3.4.6 of the 2015 RDA. These three reports are described in [Table 1](#) below which is copied from the 2015 RDA (page 7-44). The table also includes when the reports are to be submitted to the Commission.

Table 1 2015 RDA Evaluation Reports

Report	RDA Proposal
Preliminary evaluation report	Report A: <ul style="list-style-type: none"> • Fall 2016 – Report take-up of the pilot in Year 1 and identify total sales and revenue under the rate. Report B: <ul style="list-style-type: none"> • Fall 2017 – Report take-up of the pilot in Year 2 and identify total sales and revenue under the rate. Report the impact of shifting in Year 1, which BC Hydro can only do at the end of F2017.
Final evaluation report	Report C: <ul style="list-style-type: none"> • Spring 2018 – summary of take-up and shifting over the two-year pilot program.

The evaluation criteria for reporting provided in section 2.3.4.6 of the 2015 RDA are:

1. Did the rate provide RS 1823 customers with lower cost options?
2. Did the rate have positive or negative impacts on non-participating customers?
3. How many RS 1823 customers used the rate? What were the volumes of use?



-
4. How did customers use the rate?
 5. To what extent did shifting contribute to higher freshet energy?
 6. Was there any shifting within the freshet period from HLH to LLH? and
 7. Were there any issues with setting baselines, implementation, or billing?

As set out in the Reasons for Decision attached to Commission Order No. G-17-16, the following additional criteria were also proposed based on stakeholder comments and BC Hydro's own further analysis:

1. How quickly did customers respond to changes in market prices?
2. Did customers with aggregated RS 1823 loads shift consumption between plants to take advantage of this rate?
3. 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? and
4. Was there any impact on RS 1880 events? Did customers use the rate as a substitute for RS 1880?

Direction 4 of Commission Order No. G-17-16 directed BC Hydro as part of the evaluation process to address, and where appropriate, evaluate the following:

- (a) Analysis of the costs/benefits to non-participating customers, including the \$0kWh floor price, and evaluating the appropriateness of sharing additional benefits with non-participating customers;
- (b) The freshet rate pilot wheeling charges as compared to those that would have been collected had FortisBC Inc.'s standby rate charges been applied;
- (c) The data, the calculations, the analysis and other considerations, if any, that went to determining each customer's baseline, each customer's freshet rate charges and each customer's RS 1823 charges;

Transmission Service Freshet Rate



-
- (d) Freshet rate engagement activities with commercial ratepayers and other ratepayer groups;
 - (e) Detailed information as to the extent of the potential energy oversupply issue and BC Hydro's progress on other strategies it is pursuing to mitigate the issue;
 - (f) All costs associated with the implementing the freshet rate pilot; and
 - (g) An analysis of the impact of any load shifting including the actual monthly consumption for each pilot participant in comparison to the respective CBLs for each.

Direction 5 stated that prior to filing the final evaluation report on the freshet rate pilot, BC Hydro is to consult with stakeholders on further process in the event there is a recommendation that the freshet pilot rate be made permanent.

Direction 6 stated that BC Hydro is to provide more clarity in its evaluations and provide more clarity as to the magnitude of the energy surplus during freshet and provide an estimate of its potential value.

To incorporate the evaluation criteria described above, the balance of this report is organized into two sections as set out below, with a concordance table as shown in [Table 2](#) to identify the specific section where the criteria has been addressed.

Direction 4(e) and Direction 6 are separately addressed in [Appendix D](#).⁴

- Section [3](#): Freshet Rate Pilot Program Implementation; and
- Section [4](#): Year 1 Results.

⁴ Please refer to footnote [2](#) regarding when Appendix D will be available.

**Table 2 Evaluation Criteria Concordance**

Evaluation Criteria	Section
Direction 4 of Commission Order No. G-17-16	
a) Analysis of the costs/benefits to non-participating customers, including the \$0kWh floor price, and evaluating the appropriateness of sharing additional benefits with non-participating customers;	4.6
b) The freshet rate pilot wheeling charges as compared to those that would have been collected had FortisBC Inc.'s standby rate charges been applied;	4.5
c) The data, the calculations, the analysis and other considerations, if any, that went to determining each customer's baseline, each customer's freshet rate charges and each customer's RS 1823 charges;	3.2, Appendix A
d) Freshet rate engagement activities with commercial ratepayers and other ratepayer groups;	2.2
e) Detailed information as to the extent of the potential energy oversupply issue and BC Hydro's progress on other strategies it is pursuing to mitigate the issue;	Appendix D
f) All costs associated with the implementing the freshet rate pilot; and	4.5
g) An analysis of the impact of any load shifting including the actual monthly consumption for each pilot participant in comparison to the respective CBLs for each.	4.3
Direction 5 of Commission Order No. G-17-16	N/A for this report
Direction 6 of Commission Order No. G-17-16	
6. BC Hydro is directed to provide more clarity in its evaluations and provide more clarity as to the magnitude of the energy surplus during freshet and provide an estimate of its potential value.	Appendix D
2015 RDA	
1. Did the rate provide RS 1823 customers with lower cost options?	4.2
2. Did the rate have positive or negative impacts on non-participating customers?	4.6
3. How many RS 1823 customers used the rate? What were the volumes of use?	4.1
4. How did customers use the rate?	4.2
5. To what extent did shifting contribute to higher freshet energy?	4.3
6. Was there any shifting within the freshet period from HLH to LLH?; and	4.3
7. Were there any issues with setting baselines, implementation, or billing?	3.2, 3.3
8. How quickly did customers respond to changes in market prices?	4.2
9. Did customers with aggregated RS 1823 loads shift consumption between plants to take advantage of this rate?	4.3
10. 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?	4.4
11. Was there any impact on RS 1880 events? Did customers use the rate as a substitute for RS 1880?	4.4

In response to Direction 4d of Commission Order No. G-17-16, BC Hydro has begun engagement with commercial ratepayers regarding potential rate options as part of Module 2 of the 2015 RDA. Work to date has focused on identifying potential rate

Transmission Service Freshet Rate



opportunities that could provide mutual value to BC Hydro and participating customers. While a freshet rate has been identified as a prospective rate option, analysis of potential benefits has not started. BC Hydro also believes there is benefit to first observing how the transmission service freshet rate has performed over two Freshet Periods before examining the potential for a similar pilot for general service customers. BC Hydro will report on its engagement activity with commercial ratepayers prior to the end of the transmission service pilot.

3 Freshet Rate Pilot Program Implementation

3.1 RS 1823 Customer Engagement

Subsequent to the Commission's approval of the freshet rate, BC Hydro scheduled workshops across the province to inform RS 1823 customers about the new rate and encourage sign-up. A total of six half-day workshops were held between February 18, 2016 and February 25, 2016 in Prince George, Quesnel, Vancouver, Kamloops, Nanaimo and Calgary. The timing of these workshops was critical because, in accordance with Special Condition 3 of RS 1892, customers must provide notice to BC Hydro by March 1st of their election to take electricity under this rate schedule for the upcoming Freshet Period.

BC Hydro is pleased to report that a total of 101 customer representatives attended the workshops. Refer to [Table 3](#) below for attendees by location.

Table 3 Number of Customer Attendees by Workshop Location

Workshop Location	Number of customer attendees
Prince George	17
Quesnel	14
Kamloops	15
Vancouver	27
Calgary	18
Nanaimo	10
Total	101

Transmission Service Freshet Rate

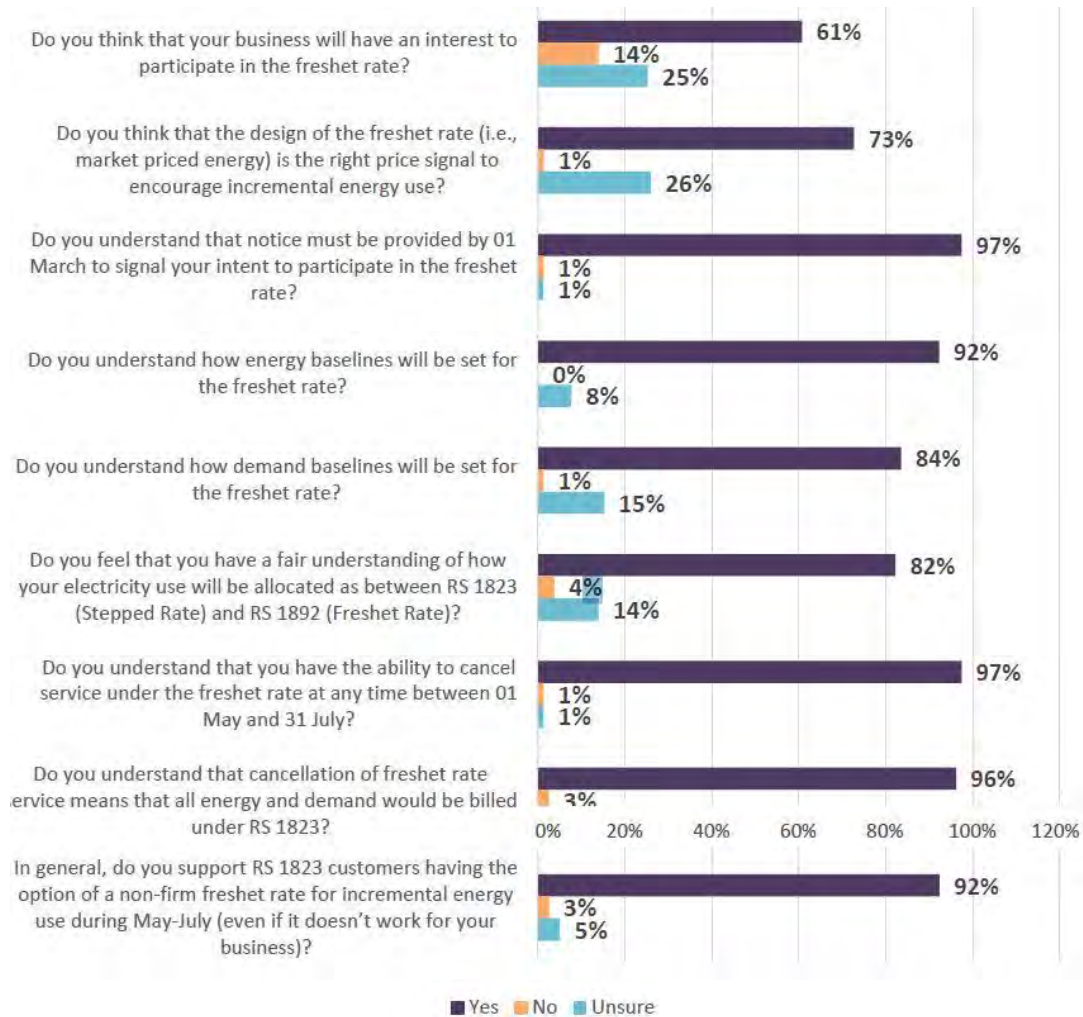


BC Hydro requested feedback from customer attendees regarding the purpose, pricing and certain design elements of the new freshet rate, as summarized in [Figure 1](#) below. The purpose of requesting this feedback was to verify that customers understand the rate and how to participate.

BC Hydro currently provides service under RS 1823 to a total of 80 corporate entities at 140 unique sites. For context, the 101 customer attendees represented 59 corporate entities (i.e., 74 per cent of total RS 1823 customer entities) and a total of 109 sites (i.e., 78 per cent of total RS 1823 customer sites). Accordingly, BC Hydro considers the customer feedback to be broadly representative of approximately 75 per cent of the transmission service customer class.



Figure 1 Customer Understanding of Freshet Rate



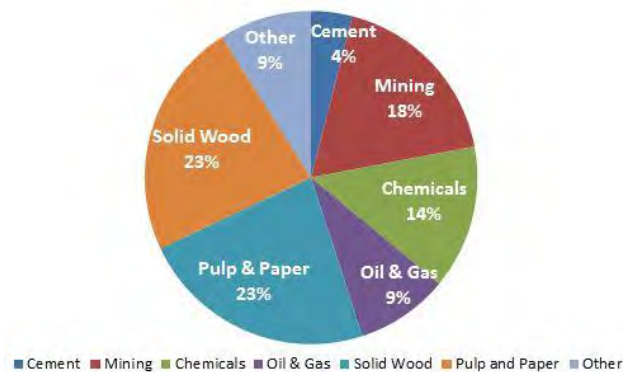
By March 1, 2016, a total of 56 unique RS 1823 customer sites provided written notice to BC Hydro via email of their election to take electricity under RS 1892 during the 2016 Freshet Period (Year 1).

Given the limited time between learning of the rate and the March 1st sign-up requirement, a number of customers provided notice of election for Year 1 on the

understanding that they could subsequently cancel this election in accordance with Special Condition 6(b) of RS 1892.

Seventeen customers subsequently cancelled their Year 1 election after determining that they had no immediate opportunity for incremental energy use. This left a balance of 39 participant customer sites for Year 1, with representation from across industry sub-sectors and regions of the province. Refer to [Figure 2](#) below.

Figure 2 Customer Participation by Industry Sub-Sector



3.2 Baseline Determination

This section describes the data, the calculations, the analysis, the process and the adjustments considered by BC Hydro in determining baselines and Reference Demand for each unique customer site.

RS 1892 billing requires the establishment of individual customer site energy baselines for High Load Hours (**HLH Baseline**) and Low Load Hours (**LLH Baseline**) and a Reference Demand. The purpose of the energy baselines is to separate RS 1823 energy purchases from incremental RS 1892 energy purchases during the Freshet Period. The purpose of the Reference Demand is to cap the participating customer's highest kV.A Demand during each month of the



Freshet Period to prevent incremental non-firm energy purchases under RS 1892 from setting a demand peak.

3.2.1 Energy Baselines

Pursuant to the definitions set out in RS 1892, BC Hydro established pro-forma HLH and LLH Baselines for each participant customer site using hourly energy consumption data from its billing system for the 2015 Freshet Period commencing at 00:00 hrs on May 1, 2015 and ending at 24:00 hrs on July 31, 2015. The hourly billing data was separated into HLH and LLH periods,⁵ which reflect 1,232 hours and 976 hours, respectively. There is a total of 2,208 hours in the Freshet Period.

- The total 2015 Freshet Period HLH energy volume (in kWh) was divided by 1,232 hours to determine the HLH Baseline (in kWh per hour); and
- The total 2015 Freshet Period LLH energy volume (in kWh) was divided by 976 hours to determine the LLH Baseline (in kWh per hour).

To verify the accuracy of each participant customer's 2015 Freshet Period energy consumption data, BC Hydro staff manually compared the RS 1892 Baseline Pro-forma with electricity invoices from the customer's May to July 2015 Billing Periods. BC Hydro included this invoice check in the RS 1892 Baseline Pro-forma to make it easier for customers to perform the same due diligence.

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 to determine the RS 1823 HLH energy volume. No adjustment to the period LLH energy volume was required because the determination of RS 1880 energy is specific to HLH.

⁵ HLH periods are 6 a.m. to 10 p.m. Monday through Saturday (excluding statutory holidays); LLH periods are 10 p.m. to 6 a.m. Monday through Saturday and all day Sunday and statutory holidays.



3.2.2 Reference Demands

Pursuant to the definition set out in RS 1892, BC Hydro determined Reference Demands 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, BC Hydro staff manually identified the actual peak kV.A demand for the customer sites. This approach was typically required in circumstances where the participant customer site was shut down during the 2015 Freshet Period.

3.2.3 Energy Baseline and Reference Demand Review and Adjustment Process

BC Hydro emailed the RS 1892 Baseline Pro-forma to each participating customer and requested that the customer review the information to confirm that it was accurate (i.e., matched their invoices) and representative of expected RS 1823 electricity usage during the 2016 Freshet Period. BC Hydro asked each participating customer to sign the RS 1892 Baseline Pro-forma as confirmation of this review.

BC Hydro staff made themselves available by email, telephone and in-person meetings to review the RS 1892 Baseline Pro-forma with participant customers, to discuss prospective actions and estimated take-up volumes, and to consider energy baseline and Reference Demand adjustments. Special Condition 4 of RS 1892 provides BC Hydro and the customer with the ability to determine alternative baselines or Reference Demand, subject to Commission approval, where the parties consider that 2015 Freshet Period data is not representative of expected RS 1823 usage during the Freshet Period of 2016 or 2017. Of the 39 participant customer sites,



-
- Thirty-two had RS 1892 baselines and Reference Demand established using unadjusted calendar 2015 data; and
 - Seven requested adjustments to their LLH and HLH Baselines and/or Reference Demand.

On April 29, 2016 BC Hydro filed the adjusted baselines with the Commission pursuant to Special Condition 4 of RS 1892. The public version of this application is attached in [Appendix A](#). BC Hydro's application included evidence: (a) to explain why the baselines calculated in accordance with the provisions of RS 1892 were not considered representative of the customer's expected RS 1823 electricity usage during the freshet period of 2016 or 2017; (b) to describe how the alternative baselines and/or Reference Demand were calculated; and (c) to confirm the customer's agreement.

As set out in the application, BC Hydro identified baseline adjustments⁶ for the events listed below:

- **Plant/equipment failure in 2015 (one customer site)** – RS 1892 energy baselines were increased to remove the verified impact of the non-recurring event;
- **Market curtailment in 2015 (one customer site)** – RS 1892 energy baselines were increased to remove the verified impact of the non-recurring event;
- **New contracted self-generation in 2016 (one customer site)** – RS 1892 energy baselines and Reference Demand were decreased to adjust for the contracted energy savings impact in 2016 of new self-generation which was not operating during 2015;
- **Major self-generation outage in 2015 (two customer sites)** – 2014 Freshet Period data was used to establish RS 1892 energy baselines and Reference

⁶ Adjustments were applied to calendar 2015 Freshet Period data unless otherwise specified.



Demand because the 2015 data was impacted by a major self-generation outage;

- **Installation of new BC Hydro-funded DSM project in 2016 (one customer site)** – RS 1892 energy baselines were decreased to adjust for the energy savings impact in 2016 of a new DSM project which was not operating during 2015; and
- **Installation of a new load facility and a new self-generation facility in 2016 at an existing customer site (one customer site)** – RS 1892 energy baselines and Reference Demand were increased to adjust for the estimated 2016 impact of a new load facility and decreased to reflect the 2016 impact of new contracted self-generation which was not operating during 2015.

Details of each specific adjustment were filed with the Commission on a confidential basis to protect commercially sensitive customer information. The Commission approved the alternative baselines and Reference Demands by Order No. G-76-16 dated May 27, 2016.

Overall, BC Hydro considers that the baseline determination process was fair, practical, efficient and well understood by customers. No material issues were identified.

3.3 Billing System Modifications

This section describes the billing system modifications made by BC Hydro in order to implement RS 1892 billing and the data and calculations used to determine each customer's electricity charges under RS 1892 and RS 1823.

In accordance with the provisions of RS 1892, BC Hydro billed participating customers only for RS 1823 electricity during the May, June and July Billing Periods, whereas billing for RS 1892 energy was conducted in August 2016. This is because



the determination of HLH and LLH Net Freshet Energy under RS 1892 requires total energy consumption volumes to be determined over the entire Freshet Period.

To distinguish RS 1823 energy from RS 1892 energy, a number of modifications were made to the billing system for transmission service customers. These modifications include:

- Design and testing of a billing software update to incorporate HLH Baselines, LLH Baselines and Reference Demand and to extract hourly energy data (including Mid-C market price data) into daily, Billing Period and 2016 Freshet period tables;
- Temporary movement of certain customer sites with a monthly billing cycle ending on the 22nd or the 26th of each month to a calendar monthly billing cycle for each of May, June and July 2016;
- Creation of RS 1892 Billing Statements for reconciliation of 2016 Freshet Period electricity use; and
- RS 1823 invoice modifications to provide for interim RS 1823 energy billing during the 2016 Freshet Period, and final RS 1823 and RS 1892 billing in August 2016.

These billing system modifications (i.e., software and invoice changes) were made by Accenture, BC Hydro's billing service provider, at a total cost of approximately \$20,000. Funding for internal staff costs related to identification, approval and project management of these functional requirements was provided through existing operating budgets.

It is BC Hydro's view that the billing system modifications for RS 1892 were straight-forward and no material issues were encountered. Further, the software modifications reflect a one-time cost only.



3.3.1 Summary Comments on Billing

Customers were initially billed for demand and energy under RS 1823 during the 2016 Freshet Period (May to July) only up to the established energy baselines and Reference Demand. Subsequently, metered energy above the energy baselines was billed in August after a reconciliation of the customer's total electricity use had been performed and energy had been allocated between RS 1823 and RS 1892 in accordance with the provisions of RS 1892.

The reconciled bill for RS 1892 Net Freshet Energy issued after the fact in August could have caused customer confusion and dissatisfaction; however, BC Hydro considers that billing for RS 1823 and RS 1892 electricity for the 2016 Freshet Period ran smoothly. Customer bills were issued in a timely manner. BC Hydro staff made themselves available to customers to explain how the charges were calculated. No customer issues or concerns with the RS 1823 and RS 1892 billing were identified.

4 Year 1 Results

This section sets out BC Hydro's Year 1 results in accordance with the evaluation criteria set out in section 2.

4.1 RS 1892 Energy Sales and Revenue

Q: How many RS 1823 customers used the rate and what were the volumes of use?

A total of 39 unique customer sites participated for the 2016 Freshet Period; however, only 26 of these sites actually purchased energy under RS 1892. The remaining 13 sites purchased less energy than their energy baselines over the entire Freshet Period such that all of the energy taken was deemed to be supplied under RS 1823. For the 26 sites that purchased RS 1892 energy during the 2016 Freshet Period, RS 1892 energy sales and gross revenue are summarized in [Table 4](#) below:



Table 4 RS 1892 Energy Sales and Gross Revenue

Total RS 1892 Energy Volume	139,064 MWh
Average Incremental Load	63 MW.hr (for total of 2,208 hrs)
Total RS 1892 Energy Sales	\$3.5 million ⁷
Total Wheeling Charges	139,064 MWh x \$3.00/MWh = \$0.4 million
5 per cent Rate Rider on RS 1892 Energy Sales and Wheeling Charges	\$0.2 million
Gross RS 1892 Revenue	\$4.1 million (excluding taxes)

4.2 Mid-C Market Pricing and Customer Load Response

Q: Did the rate provide RS 1823 customers with lower cost options?

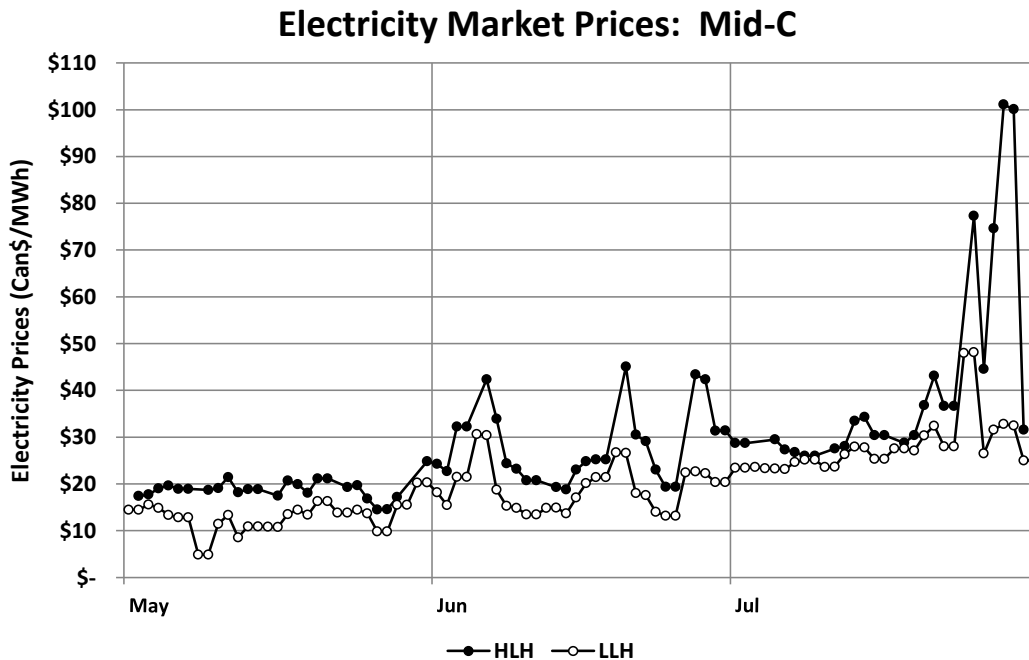
For almost all of the hours in the 2016 Freshet Period, the price for RS 1892 electricity was below the otherwise applicable price(s) for RS 1823 electricity. Given that participating RS 1892 customers had advance knowledge of day-ahead market prices for both HLH and LLH, and had the discretion to participate on a daily basis for each of the 92 days in the 2016 Freshet Period, it is BC Hydro's view that the Freshet Rate provided customers with a lower cost option for incremental load.

[Figure 3](#) below shows the average daily Mid-C market energy prices in both HLH and LLH for the 2016 Freshet Period. LLH prices ranged from CAD \$4.85/MWh - \$48.14/MWh and HLH prices ranged from CAD \$14.51/MWh - \$101.09/MWh. At no point during the 2016 Freshet Period was the floor price of \$0/MWh applied pursuant to 1(b) of the RS 1892 energy charge.

⁷ Reflects an average Mid-C market energy price of CAD \$24.88/MWh.



Figure 3 Electricity Market Prices: Mid-C



The average weighted price paid by all customers for RS 1892 energy was CAD\$24.88/MWh, plus the \$3.00/MWh wheeling rate and 5 per cent rate rider. However, the average unit cost of RS 1892 energy paid by each specific customer was higher or lower than that due to their unique mix of Net Freshet Energy in HLH and LLH for each day.

Q: How quickly did customers respond to changes in market prices?

In general, customers appeared to operate their facilities to optimize electricity costs such that the aggregate load increase was typically highest when market prices were low and vice versa. For example, the highest aggregate load increase (~90 MW) was experienced in May 2016 when average market prices were lowest (~\$20/MWh). [Figure 4](#) and [Figure 5](#) below illustrate the aggregate customer response (load shape) to changes in market prices.



Figure 4 Aggregate Incremental Load

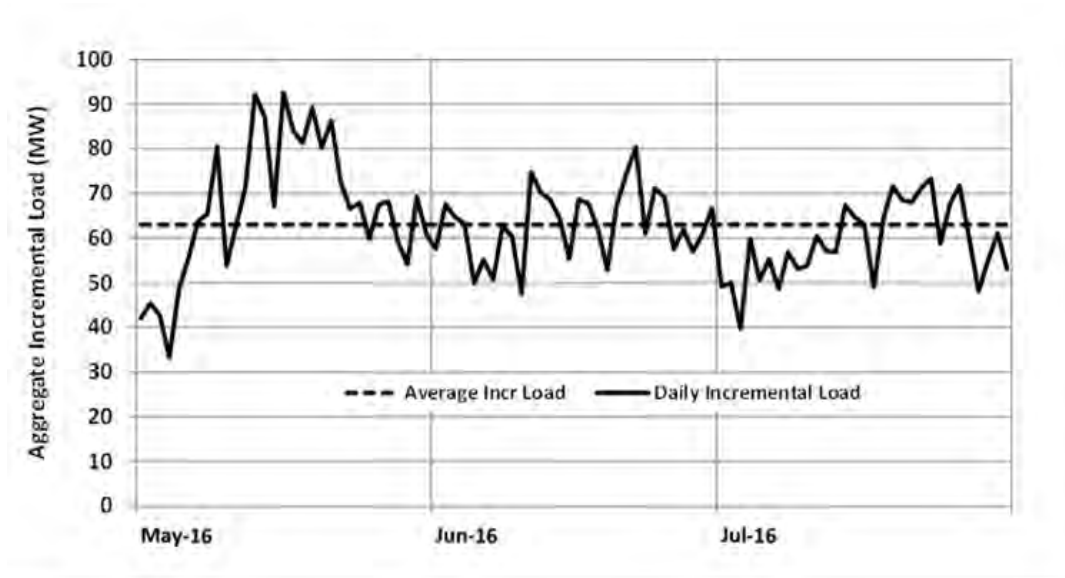
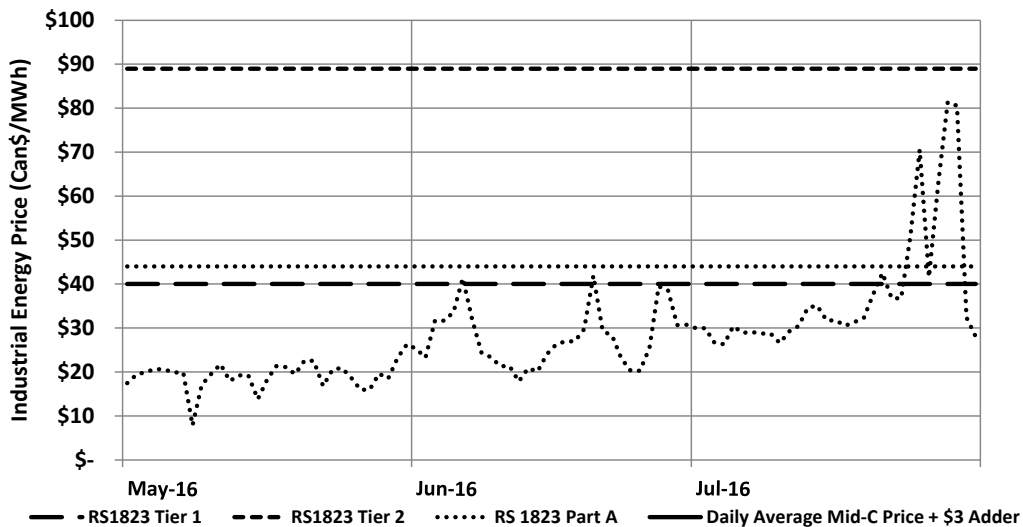


Figure 5 Industrial Energy Prices



Notably, at the end of July, market prices experienced an upwards spike due to a heat wave in the Pacific Northwest. Some customers advised that they were closely



monitoring market prices and immediately adjusted load down. However, some customers indicated that they did not adjust load because they were either unaware of the price spike (i.e., they were not monitoring the daily market prices) or had made unavoidable operational commitments to incremental production on those days. In these circumstances, customers advised that the short-term price increase (i.e., for only a few days in July) was mitigated by lower prices across the entire 2016 Freshet Period. In summary, this information suggests that some customers responded on a day-to-day basis, while others responded less quickly or not at all.

Q: How did customers use the rate?

Customers took various actions to increase load during the 2016 Freshet Period, including the following:

- Using idle production capacity (including higher utilization of operating plant, temporary re-start of existing equipment, addition of production shifts, manufacture of more energy intensive product grades, transfer of feedstock between facilities);
- Optimizing production to maximize output without the constraint to avoid setting an HLH demand peak under RS 1823;
- Re-scheduling maintenance shutdowns into non-freshet months; and
- Turning down and curtailing self-generation (planned and unplanned).

4.3 Load Shifting

Q: To what extent did load shifting contribute to higher freshet energy?

BC Hydro will not be able to provide an analysis of load shifting and monthly consumption relative to each customer's annual Energy CBL until we have data for the full year (i.e., when the fiscal year ended March 31, 2017 is complete). This was contemplated in the 2015 RDA as shown in the table from the application describing



the three evaluation reports (refer to section 2.2). While some customers have provided preliminary information regarding load shifting, such as the re-scheduling of maintenance into non-Freshet months noted above, it is not yet possible to verify the impact of these events over the full year. BC Hydro will consult further with customers and endeavour to verify the volumes of load shifting energy during F2017 and report this information in its Year 2 report.

BC Hydro recognizes that load shifting (i.e., a load increase in Freshet Period months offset by a load decrease in non-Freshet Period months, such that there is no net incremental annual electricity use) was a principal concern identified during the regulatory process. All else being equal, the effect of load shifting is to change the realized energy price and revenue for the same volume of annual energy sales. Where the average RS 1892 energy price is lower than the RS 1823 energy price, load shifting would result in a revenue reduction.

Q: Was there any shifting within the freshet period from HLH to LLH?

Anecdotally, BC Hydro is aware of one customer that considered modifying its operating hours with the intent to shift a portion of production from HLH to LLH. However, BC Hydro does not have sufficient information at this time to determine if the customer was able to implement the operating change.

Q: Did customers with aggregated RS 1823 loads shift consumption between plants to take advantage of this rate?

BC Hydro was advised that certain customers with operations in other jurisdictions made the decision to consume incremental energy in B.C. under RS 1892 based on a lower marginal cost of production.

Additionally, one customer advised that it diverted feedstock between its B.C. plants under a RS 1823 Energy CBL aggregation to optimize electricity costs across the plants.



4.4 Operational Considerations

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

No, BC Hydro did not curtail RS 1892 service to any customer during the 2016 Freshet Period because sufficient energy and capacity was available at all times to serve the incremental load. There were no negative financial impacts to BC Hydro from not curtailing customers.

Q: Was there any impact on RS 1880 events? Did customers use the rate as a substitute for RS 1880?

Yes, the option of RS 1892 energy had an impact on RS 1880 usage. BC Hydro is aware that two customers with self-generation facilities used service under RS 1892 as a substitute for RS 1880 during periods of generator outage (one outage was planned; the other was unplanned).

Where a customer experiences an unplanned generator outage during the Freshet Period and desires to maintain full plant production, BC Hydro considers that the customer would typically request non-firm service under RS 1880 if RS 1892 was not available. BC Hydro will consult further with its self-generating customers and endeavour to verify the volumes of incremental electricity purchased under RS 1892 that would have otherwise been purchased under RS 1880 and report this information in its Year 2 report.

4.5 Financial Considerations

4.5.1 Wheeling Rate

Direction 4b of Commission Order No. G-17-16 directed BC Hydro as part of its reporting to address, and where appropriate, evaluate the wheeling rate under RS 1892 as compared to FortisBC Inc.'s standby rate. BC Hydro's RS 1892



wheeling rate is \$3.00/MWh and FortisBC Inc.'s standby rate is \$4.00/MWh (as shown in Schedule 37 for Large Commercial Standby Service⁸). The wheeling rate difference is \$1.00/MWh. If the RS 1892 wheeling rate had been \$4.00/MWh, this would have provided an additional \$139,064 plus rate rider of revenue in Year 1, assuming the same total RS 1892 energy volume of 139,064 MWh. Although incremental wheeling rate revenue would be to the benefit of non-participating customers, BC Hydro is not proposing to change the current RS 1892 wheeling rate for Year 2 of the pilot. As discussed in section 4.6, BC Hydro's rate design principle is that non-participants would be held harmless for the freshet rate, and there is a positive benefit in Year 1 to all ratepayers. BC Hydro also believes that the rationale for the \$3.00/MWh wheeling rate provided in the 2015 RDA is still appropriate.

4.5.2 Incremental Costs

As of November 2016, BC Hydro has incurred approximately \$115,000 in incremental costs specific to the design and implementation of the freshet rate pilot. Refer to [Table 5](#) below. All other staff and administration costs were funded under existing operating budgets.

Table 5 Freshet Rate Pilot Incremental Cost

	(\$)
1. Freshet Rate Design and Regulatory Approval	40,000
2. RS 1823 customer Engagement	30,000
3. Billing implementation	20,000
4. Year 1 Evaluation Report Preparation	25,000
Total Incremental Cost	115,000

⁸ Schedule 37 can be found in FortisBC Inc's Electric Tariff at <https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/Documents/FortisBCElectricTariff.pdf>.



4.6 Ratepayer Impacts

Q: Did the rate have positive or negative impacts on non-participating customers?

BC Hydro's preliminary view is that the rate had a positive impact on both participant and non-participant customers. For all ratepayers, BC Hydro has calculated a preliminary Year 1 benefit of approximately **\$2.0 million** positive as described below. This preliminary benefit remains subject to a number of critical assumptions that will be reviewed when BC Hydro has complete F2017 data and reported as part of BC Hydro's Year 2 report.

The customer feedback discussed in the next section below provides information on the positive impacts of RS 1892 for participants.

4.6.1 Preliminary Estimate of Year 1 Ratepayer Benefit

During the 2016 Freshet Period, with the exception of some LLH periods in the first half of May, BC Hydro experienced few system minimum generation constraints. Further, there was a strong, sustained shift to market exports commencing in May, whereby HLH exports were generally constrained by US tie-line transmission limits and with the exception noted above, LLH exports were generally constrained by energy market liquidity. As such, BC Hydro considers that its import/export activity in the US and Alberta markets was generally not impacted by the 139 GWh of RS 1892 energy sales.

On a retrospective basis, BC Hydro considers RS 1892 energy volumes to have primarily translated into a change in its large basin operations. That is, where import/export volumes are held constant, the loading of BC Hydro's large basin generation was increased to serve the additional RS 1892 load. BC Hydro considers that the benefit or cost impact of this circumstance can be estimated by comparing the actual revenue gained from RS 1892 energy sales with the value of the



water/energy that was removed from the BC Hydro large basin 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 is expressed as a System Marginal Value, whereby:

- If market prices were below the System Marginal Value, generation would be backed down and energy would be imported; and
- If market prices were above the System Marginal Value, generation would be increased and energy would be exported.

For the 2016 Freshet Period, System Marginal Value is best reflected by BC Hydro's Kinbasket (KBT) reservoir, where marginal values ranged from CAD \$12.55 to \$21.16/MWh. BC Hydro considers that the difference between the value of actual RS 1892 energy sold at Mid-C market prices plus the \$3.00/MWh wheeling rate (calculated hourly, in \$/MWh) and BC Hydro's System Marginal Value at KBT (calculated hourly, in \$/MWh) is an appropriate methodology to estimate the gross ratepayer benefit of incremental RS 1892 energy sales. The RS 1892 value methodology is illustrated in [Figure 6](#) below.

Figure 6 RS 1892 Value Methodology

$$\boxed{\begin{array}{c} \text{RS 1892} \\ \text{Value} \\ \$ \end{array}} = \boxed{\begin{array}{c} \text{RS 1892} \\ \text{Energy Volume} \\ \text{MWh} \end{array}} \times \left[\boxed{\begin{array}{c} \text{(Mid-C Price +} \\ \text{\$3/MWh wheeling)} \\ \text{x 105\%} \end{array}} - \boxed{\begin{array}{c} \text{KBT} \\ \text{Marginal} \\ \text{Price} \\ \text{\$/MWh} \end{array}} \right]$$

$$\text{\$2.0 million} = 139.06 \text{ GWh} \times \{1.05 \times (\text{\$24.88/MWh} + \text{\$3.00/MWh}) - \text{\$15.09/MWh}\}$$

The average weighted price paid for RS 1892 energy by participant customers was CAD\$24.88/MWh plus a \$3.00/MWh wheeling rate and 5 per cent rate rider, for a total of CAD \$29.28/MWh. This compares to an average System Marginal Price for



KBT of CAD \$15.09/MWh. The difference between these two values is \$14.19/MWh which is multiplied by the RS 1892 energy volume to determine the gross ratepayer impact. Using this approach, BC Hydro has determined a preliminary value of approximately **\$2.0 million** positive for RS 1892 energy sales.

Importantly, this estimate assumes that all RS 1892 energy volumes reflect load that is 'truly incremental' (i.e., the 2016 Freshet Period incremental load would not have occurred in the absence of the new rate and no incremental market import/export opportunity was available in any given hour during the 2016 Freshet Period). BC Hydro cautions that these critical assumptions have not yet been verified.

As described previously, the fiscal year (F2017) is not yet complete, some customers have provided only limited or anecdotal information about actions taken to increase load, and no engineering analysis has been conducted to verify the energy consumption impact of specific actions, including load shifting and substituting service under RS 1892 for RS 1880. Accordingly, BC Hydro considers that it does not yet have sufficient information to verify any adjustments (reductions) to RS 1892 energy volumes that would subsequently be incorporated into this benefits analysis.

4.6.2 Appropriateness of Sharing Benefits with Non-participant Customers

BC Hydro's rate design principle is that non-participants should be held harmless by the freshet rate. The preliminary results of this Year 1 evaluation indicate a positive benefit that accrues to all BC Hydro ratepayers.

4.7 Customer Feedback

In September 2016, BC Hydro requested written feedback (via email) from the 39 Year 1 participant customers regarding their experience with the rate. As a general guide, BC Hydro provided customers with 21 questions across five categories: (1) Sign-up and approval process; (2) Baseline determination;



(3) Actions taken; (4) Results achieved; and (5) Review and recommendations.

Refer to [Appendix B](#) for a copy of the feedback questions.

Customers were asked to provide their written comments to BC Hydro by September 30th. Thirty of the 39 participant customers responded. Their feedback is summarized below. Separately, the Association of Major Power Customers (**AMPC**) also provided summary feedback on behalf of its members. Refer to [Appendix C](#).

4.7.1 Customer Feedback Regarding Year 1

In general, customers indicated that:

- The sign-up process was both straightforward and low risk, given the ability to 'opt out' of the rate any time prior to July 31, 2016;
- The baseline determination process was clear and the baselines established were fair; and
- They were satisfied with the rate and viewed it as an opportunity to produce additional volumes of product(s) at lower cost.

4.7.2 Customer Feedback Regarding Year 2

Customers indicated that they would participate in Year 2 of the pilot and consider additional actions to use incremental electricity. A number of customers flagged their reluctance to make capital investments and/or permanent operating changes to use incremental electricity in the absence of an assurance that the Freshet Rate would extend beyond the two year pilot period. Customers also made the following suggestions and recommendations for improvement:

- Shift the Freshet Period to run from April to June;
- Extend the Freshet Period by one month (i.e., April to July); and
- Expand the program to align with market-based opportunity for incremental production over 12 full months.



4.7.3 Customer Feedback Regarding Rate Administration

A number of customers found the Intercontinental Exchange Day Ahead Power Price Reports (**ICE Reports**) confusing, especially in relation to pricing for weekends and public holidays. For instance, the Thursday ICE Report includes market pricing information for Friday and Saturday, while the Friday ICE Report includes market pricing information for Sunday and Monday. This makes the “day ahead” price difficult to ascertain. Specifically, customers recommended that BC Hydro should consider:

- Providing a fixed, pre-determined monthly price option based on Mid-C forward contract settlements. For example, set a freshet price for May two weeks prior to May 1st so participants can finalize their production plans;
- Sending simplified pricing information with the “all in” daily HLH and LLH prices (i.e., adjusted for CAD/US exchange rate, including wheeling rate and rate rider); and
- Providing a monthly progress report on estimated RS 1892 energy volumes and pricing for accrual purposes.



Transmission Service Freshet Rate

Preliminary Evaluation Report for Year 1

Appendix A

Freshet Baseline Application (April 29, 2016)

Public Version



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)

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- 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;



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“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 kV.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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Baselines Application (the Application)

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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 kV.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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Baselines Application (the Application)

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For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

A handwritten signature in blue ink, appearing to be "Tom Loski".

(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 D
Freshet Rate Pilot Final Evaluation Report
Attachment 1
Preliminary Evaluation Report for Year 1
Appendix A

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 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

.../2

**Rate Schedule 1892 -
Transmission Service Freshet Energy Baselines Application**

Transmission Service Freshet Rate
BC Hydro Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18
Transmission Service Market Reference
Priced Rates Application

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Appendix D
Freshet Rate Pilot Final Evaluation Report
Attachment 1
Preliminary Evaluation Report for Year 1
Appendix A

Appendix A

Order G-xx-xx

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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 -
Transmission Service Freshet Energy Baselines Application**

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Transmission Service Freshet Rate
BC Hydro Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18

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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

Rate Schedules
Effective: February 9, 2016
Original of Page 63-3

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;

Accepted for Filing: March 3, 2016
Order G-17-16



Rate Schedule 1892 - Acting Commission Secretary
Transmission Service Freshet Energy Baselines Application

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Transmission Service Freshet Rate
BC Hydro Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18
Transmission Service Market Reference
Priced Rates Application

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Appendix B

BC Hydro

Rate Schedules
Effective: February 9, 2016
Original of Page 63-4

"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).

Taxes: The rates contained herein are exclusive of the Goods and Services tax and the Social Services tax.

Note: The terms and conditions under which transmission service is supplied are contained in Electric Tariff Supplements 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.

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Appendix C

Customer RS 1892 Baseline Information

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**BC Hydro Rate Schedule 1892 – Transmission
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Catalyst Crofton

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Catalyst Port Alberni

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Appendix C-3

Catalyst Powell

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Canfor Chetwynd

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Nanaimo Forest Products

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Skookumchuck Pulp Mill

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Tree Island Industries

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Appendix D

**List of Freshet HLH and LLH Baselines and
Reference Demands for Commission Approval**

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Transmission Service Freshet Rate

Preliminary Evaluation Report for Year 1

Appendix B

Customer Feedback Questions

Freshet Rate Pilot - Year 1 Review

Sign-up and Approval Process

- How did you learn about the Freshet Rate?
- Did you have any concerns about signing up for the Freshet Rate pilot?
- Did you need to get senior management approval to authorize your firm's participation?
- What was the single biggest reason why you chose to participate?
- How did you find the sign-up / registration process for the Rate? Was it easy or hard?

Baseline Determination

- Do you think that the energy and reference demand baselines determined by BC Hydro for your facility were appropriate?
- Do you think that the baselines fairly represented 'normal operations' for your plant, such that you had a clear benchmark against which incremental energy use could be determined?
- If adjustments were made to your baseline, how would you characterize your experience in dealing with BC Hydro to agree on these adjustments?

Actions Taken

- What specific actions did you take in your facility to increase electricity use during the Freshet Period? Tell us about your experience ...
- Did you have a specific action plan? Did any specific actions or initiatives work better than others?
- How did you communicate details of the Rate to your operational staff?
- How did you use the day-ahead market pricing information provided by BC Hydro to shape your actions?
- Did you make any investments in equipment, technology, or resources to take advantage of the Rate?
- Did you focus on differentials between HLH or LLH periods or was the focus more on certain days, certain months or the entire Freshet Period?

Results Achieved

- What specific results did you achieve? Consider operational, financial, production, resourcing impacts ...
- Did you set specific targets? Did you achieve them?
- What tools, metrics, feedback loops did you use to assess how you were tracking against your target objectives?

In Review

- What are your over-arching views on your Year 1 Freshet Rate experience? Was it beneficial? Why or why not?
- Do you intend to participate in Year 2 of the pilot? Is there anything that you will look to do differently? Do better?
- Do you plan to make any specific investments in preparation for Year 2?
- Do you have any suggestions for BC Hydro on how to improve the pilot for Year 2?



Transmission Service Freshet Rate

Preliminary Evaluation Report for Year 1

Appendix C

AMPC Feedback Letter

November 29th 2016
British Columbia Utilities Commission
Sixth Floor 900 Howe Street
Vancouver V6Z 2N3

Attention: Ms. Laurel Ross, Acting Commission Secretary and Director

I write on behalf of The Association of Major Power Customers (AMPC) to express support and appreciation for BC Hydro's recent innovative and flexible approach to rate design that has resulted in a successful proof of concept for the Freshet Rate (RS1892).

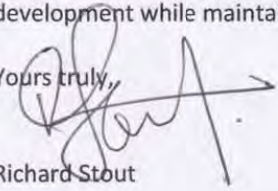
The freshet pilot has clearly demonstrated that surplus electricity may be sold at fair market value to industrial customers capable of finding new ways to use a temporary surplus of power within a framework that benefits all customers of BC Hydro and the province.

In spite of the short notice and limited duration, enough customers participated in the pilot to provide a valuable learning experience for all involved. AMPC would also like to take this opportunity to offer the following suggestions for further development of mutually beneficial surplus electricity sales arrangements:

1. **Provision of a longer term Freshet rate option** (e.g. 10 years) would allow more effective participation, as customers would be able to justify investments in their facilities that would allow them to better utilize cyclical or temporary surpluses.
2. **Addition of a Freshet "buyback" provision** that would remove a deterrent to participation due to the fear of causing an inadvertent reset of RS 1823 CBL through the RS1892 mechanism. This provision should be designed in a way that would hold the customer, BC Hydro and other ratepayers harmless from such unintended consequences of participating in the freshet program.
3. **Extension of surplus sales beyond the freshet season** in order to maximize opportunities for all customers to benefit from incremental consumption within BC. The current supply/demand balance of BC Hydro indicates that temporary surplus opportunities exist well beyond the traditional Freshet period.

AMPC looks forward to working with BC Hydro in the further development of the Freshet rate and other rate design options that would advance BC Hydro's goals of supporting economic development while maintaining competitive rates for all customer groups.

Yours truly,


Richard Stout

Transmission Service Freshet Rate

Preliminary Evaluation Report for Year 1

Appendix D

BC Hydro System Conditions during Freshet and Associated Management Strategies

Appendix D:

BC Hydro System Conditions during Freshet and Associated Management Strategies

1. Introduction

BC Hydro proposed the freshet rate pilot to, among other things, assist in the management of the freshet oversupply in the BC Hydro system by providing the option to:

- Increase the ability to import electricity during low priced periods;
- Reduce the volume of surplus energy being forced to export markets; and/or
- Reduce spill at BC Hydro facilities.

With the Commission approval of the freshet rate pilot, Commission Order No. G-17-16 included the following:

Direction 4 as part of the evaluation process to address, and where appropriate, evaluate the following:

- (e) Detailed information as to the extent of the potential energy oversupply issue and BC Hydro's progress on other strategies it is pursuing to mitigate the issue; and

Direction 6 stated that BC Hydro is to provide more clarity in its evaluations and provide more clarity as to the magnitude of the energy surplus during freshet and provide an estimate of its potential value.

This Appendix reviews the supply situation that exists during the freshet period and its impacts, as well as how BC Hydro manages the supply portfolio during the freshet period (sections [1](#) and [3](#)), and the value of surplus to BC Hydro (section [4](#)). It identifies other actions including the freshet rate that will extract further value from the supply portfolio (section [5](#)).

In general, BC Hydro is of the view that it has over time acquired resources that were the most cost effective options when acquired inclusive of any freshet impacts, and that it manages the resulting supply portfolio in order to maximize the value of the resource portfolio inclusive of the freshet period.

BC Hydro continues to seek additional options, including the introduction of the freshet rate, to increase the value of the resource portfolio.

BC Hydro also concludes that the freshet supply situation and our limited ability to absorb further freshet energy results in very low values for freshet energy, and is expected to inform how BC Hydro will structure and evaluate future energy acquisition processes.

1. Background

1.1. Increase in Freshet Energy

Energy oversupply during freshet period is a seasonal condition in the BC Hydro system. Elevated generation in the freshet has always been the case because BC Hydro's resource portfolio is predominantly hydroelectric¹ with significant freshet inflows due to snowmelt. Approximately one half of the total annual system inflow volumes occur in the freshet, when system loads and market prices are low.

Where available, reservoir storage is used to capture the freshet inflows, which can then be used in later periods to serve load or for export when market prices are higher. System storage in Williston Reservoir on the Peace River and Kinbasket Reservoir on the Columbia River accounts for approximately 90 per cent of BC Hydro storage. Smaller reservoirs in the Bridge, Campbell, and Stave River systems, among others, also contribute to storage in the BC Hydro system. Figure 1 illustrates the imbalance between load and inflow for an average water year, and the role of system storage in shifting energy.

Over the past ten years BC Hydro has increased its portfolio of resources to meet its energy planning criteria under expected load growth by acquiring the most cost effective resources that were available at the time. A large number of these acquisitions were for energy from run-of-river facilities, the result of which has been an increase in must-take² energy of about 3,000 GWh during the freshet period, by 2018 (Figure 2).³ At the same time, BC Hydro has been in a period with little or no net growth in freshet load, even though load growth was anticipated at the time the acquisitions were made.

The result has been an increase in the seasonal imbalance of load and resources in the freshet as demonstrated in Figure 3, which compares the monthly System Minimum Generation² to annual load for the year 2006 and 2018, as well as monthly System Minimum Energy level⁴ for 2018. This figure shows that under average water conditions System Minimum Generation now exceeds demand in June whereas in 2006 significant flexibility existed in the system to facilitate the import of low price freshet

¹ BC Hydro resource portfolio mix by annual generation forecast for F2017 (BC Hydro owned and IPP): hydroelectric (91.0 per cent), biomass (4.5 per cent), wind (2.2 per cent), waste heat/municipal solid waste (0.5 per cent), solar (0.01 per cent), gas fired thermal (1.8 per cent).

² Refer to section [1.3](#) for definitions.

³ Over the same period, there was minimal increase in freshet must take generation from BC Hydro's heritage resources (approximately 80 GWh increase due to facility upgrades).

⁴ System Minimum Energy level is minimum generation plus generation that must occur in order to avoid spill at Williston and Kinbasket (Freshet Shapeable Generation). Refer to section [1.3](#) for definitions.

energy from out of province. Additionally, System Minimum Energy now exceeds load in both June and July in an average water year. Key issues include the frequency that minimum generation exceeds load in the freshet, how often BC Hydro is able to export that energy or when it must be spilled, and what value the surplus energy has in the markets when it can be exported.

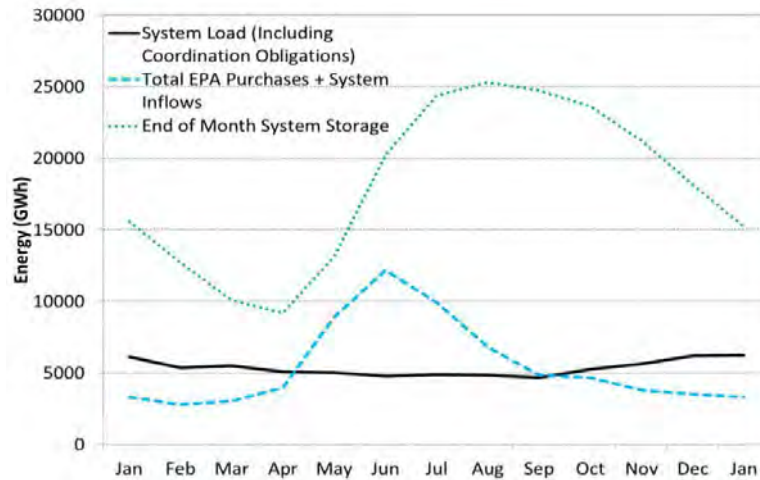


Figure 1 Forecast 2018 Monthly Load in Comparison to System Inflow under average inflow conditions, and the effect on BC Hydro Storage

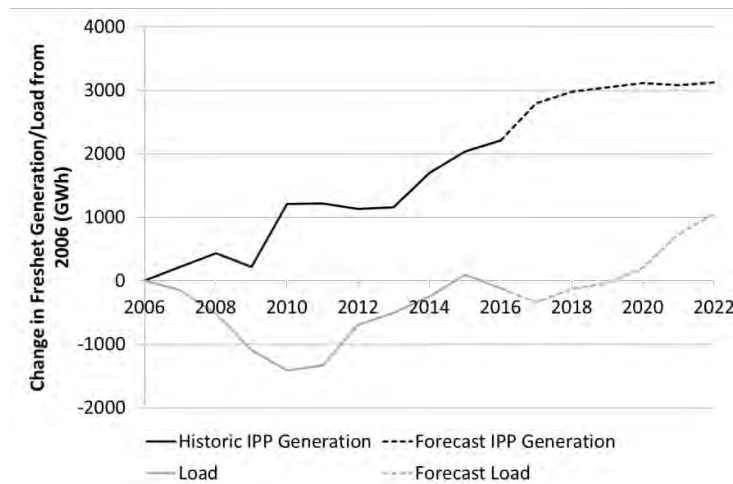


Figure 2 Change in May-July Energy Volumes from 2006 for EPA Purchases⁵ and BC Hydro Integrated System May - July Load

⁵ Forecast IPP generation is net of IPP energy that can be economically turned down during the freshet, thereby representing all must-take IPP energy and economic IPP energy. This reflects the IPP forecast filed in the 2016 RRA.

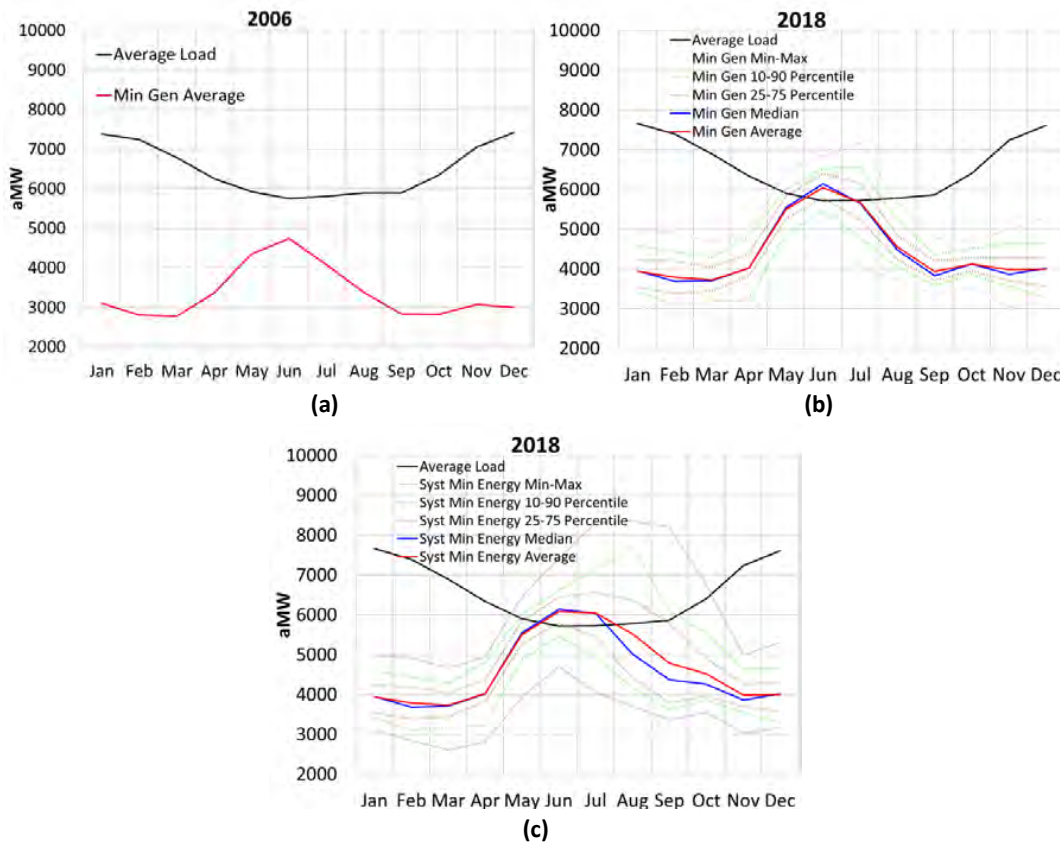


Figure 3 (a) 2006 Minimum Generation⁶ and Load under Average Inflow Conditions, (b) 2018 Minimum Generation and Load under Various Inflow Conditions, (c) 2018 System Minimum Energy and Load under Various Inflow Conditions

1.2. System Operations

BC Hydro’s operating strategy follows the same principles in the freshet period as in the rest of the year, with the objective of maximizing the consolidated net revenue from operations.⁷ BC Hydro will shape generation into the highest value periods available within the limits of flexibility of the system. During the freshet, the flexibility to shape generation is less than at other times of the year; however, the objective of maximizing consolidated net revenue remains the same.

⁶ Minimum generation is modeled using all historic inflow sequences for the resource portfolio in year 2006 and 2018.

⁷ Consolidated refers to the combined activity of both BC Hydro (domestic) and Powerex (trade). BC Hydro will purchase energy to meet load when required, and will sell surplus energy. In contrast, Powerex buys energy for the purpose of reselling it into the market for profit. All of Powerex’s net trade income goes to rate payers.

Over the winter and in preparation for the freshet, BC Hydro generates to draft its large reservoirs to make space to store freshet inflows. The operating strategy has BC Hydro's large system reservoirs drafted to levels that will balance the gains from keeping the reservoirs higher (head gains) against the cost (risk of spill), while considering market price and inflow uncertainties. While the benefits associated with head gains are almost exclusively economic, the costs associated with spill will include other factors such as incremental gate and spill chute wear, plunge pool erosion, and elevated total dissolved gas downstream that can be harmful to fish. While these other factors are not explicitly modeled, system operators will at times make adjustments to generation dispatch to mitigate these issues. This operating strategy typically results in projects with upstream storage operating at minimum generation across a significant portion of the freshet, and under average conditions results in a system spill risk of approximately 10 per cent.

Backing down large system reservoir generation to minimum means that much of the inflow is stored in the reservoir for later use in higher value periods, and the must-take energy from hydroelectric facilities with no storage is used to meet load. However, as part of the optimization of system operations, in some years (typically periods with higher than forecasted inflows) these facilities are required to generate above minimum in order to maintain an acceptable spill risk.

1.3. Definitions

This paper has already used some standard terms like *system minimum generation*, *system minimum energy* and *must-take energy*. These terms and others used to categorize the different components of freshet energy and spill are defined below and summarized in Figure 4.

Must-take energy - energy that cannot be stored at the facility for later use (i.e., must be used immediately when it is available). It includes generation from BC Hydro and IPP resources with little or no storage, after consideration of any turn down rights BC Hydro has (refer to section [5.3](#) for details on turn down rights). It also includes generation from large storage basins required to meet local reliability requirement or water license commitments. At facilities with little or no storage, must-take energy increases significantly during the freshet due to increased inflow volumes, especially during years with high snowpack.

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

Freshet Shapeable Energy - generation 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.

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

System spill – spill that occurs when a system reservoir (Williston and/or Kinbasket) is either at or close to its normal full supply level and either:

- Inflows exceed the maximum generating capability of the hydroelectric power plant. Under these conditions, release of water through a spillway will be required to preserve the integrity of the hydroelectric facility; or
- System generation is required to be reduced due to limited transmission intertie export capacity. Under these conditions, generation output at specific projects must be reduced from full capacity and water is spilled.

Economic spill – spill that occurs when market prices are very low. Under these conditions, BC Hydro may reduce generation at some facilities, either to avoid exporting the surplus at a loss (i.e. if the market value is less than the wheeling cost), or to support additional imports (when market prices are negative), and spill the energy that could have been generated.

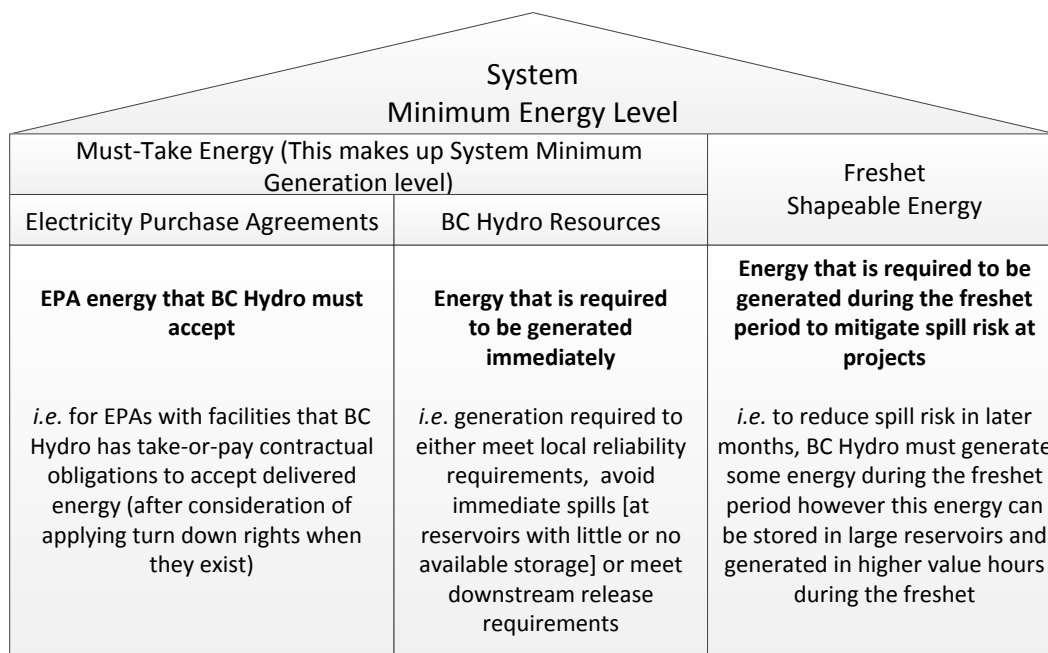


Figure 4 Components that make up BC Hydro System Minimum Energy

3. Magnitude of the Freshet Surplus and System Impacts

The increased freshet surplus over the last ten years has impacted both import/exports and system spill risk, and has resulted in:

- Growing volumes of forced exports;
- Reduced shaping capability within the freshet;

- Higher likelihood of hitting transmission intertie constraints, thus necessitating additional spill from system reservoirs; and
- Reduced capability to import electricity during low priced period.

This section will discuss the magnitude of the historical and forecast freshet surplus from 2006 to 2018 and the impacts it has had on the system.

3.1. Import/Export Impacts

From 2006 through 2018 (projected), there will have been about 3,000 GWh of additional must-take freshet energy added to the BC Hydro system, coupled with negligible load growth across the same period. This has shifted the load-resource balance in the freshet from a position where flexibility existed to import significant low priced freshet energy, to now being forced to export surplus energy into that same low priced market. Figure 5 shows actual historic average import and export levels during the freshet periods. These net exports are driven by a combination of must-take energy deliveries, shapeable energy and economically driven exports (high market price conditions). The high degree of year-over-year variability in the net export balances is due to the combination of shapeable energy (inflow driven), and economic exports (market driven). While highly variable, the data does show that:

- There is an overall trend towards higher net exports, particularly in the off-peak hours. This can be directly attributable to the significant increase in must-take energy over the last ten years combined with no net load growth during the freshet period (refer to Figure 2).
- There is a correlation between system inflows and average net exports across the freshet. This correlation is derived from both the combination of increased must-take energy and the tendency towards more shapeable energy in high inflow years.

The freshet period has been defined to extend from May through July for the Freshet Rate Pilot. On average, this period will have the highest system minimum generation levels, along with the lowest system loads. However, from an operational perspective, freshet conditions (high must-take energy in the BC Hydro system coupled with low price market conditions) will often extend from about mid-May through to early-July. In the first half of May must-take energy is ramping up with increasing inflows to the system, while in the second half of July external market prices are increasing with the combination of air-conditioning loads in the U.S. and receding regional inflows. As such, the month of June will typically be the critical period with a combination of a high freshet over-supply coupled with low external market prices.

Figure 6 shows the evolution of the system load-resource balance (i.e. net trade position) for the month of June for must-take resources under average inflow conditions. The graph shows that under average system conditions the potential for imports and forced exports has shifted in the last ten years from a

flexibility to import about 1000 aMW to 400 aMW⁸ of forced exports. Note that the addition of shapeable generation to Figure 6 would result in a larger level of forced exports in recent years. This shift in load-resource balance has had the following impact on import/export activity:

- Ten years ago, with net import flexibility in the freshet, the BC Hydro storage system was able to time shift low cost imported energy from the freshet to the upcoming fall and winter periods.
- By about 2010, the acquisition of must-take energy, along with no freshet load growth, had diminished this flexibility to near zero.
- By 2018, the acquisition of additional must-take energy is expected to result in about 400 aMW of surplus energy in June under average inflow conditions. Thus in this period this energy must be either exported (in both Heavy Load and Light Load Hours), or spilled from projects within the system.

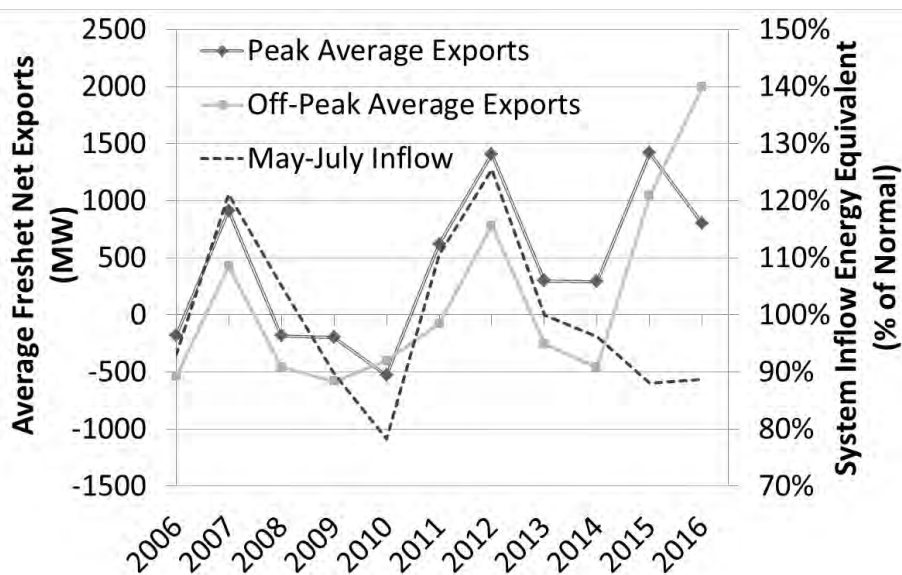


Figure 5 Historic Actuals of Average Peak and Off-Peak Net Exports during Freshet (2006 to 2016)

⁸ aMW represents *average MW*, which is total energy in a certain time period divided by number of hours in that time period. aMW can be converted to energy for a given period of time by multiplying by the number of hours. For example, 400 aMW in June is equal to 400 MW x 30 days x 24 hr/day = 288,000 MWh (288 GWh).

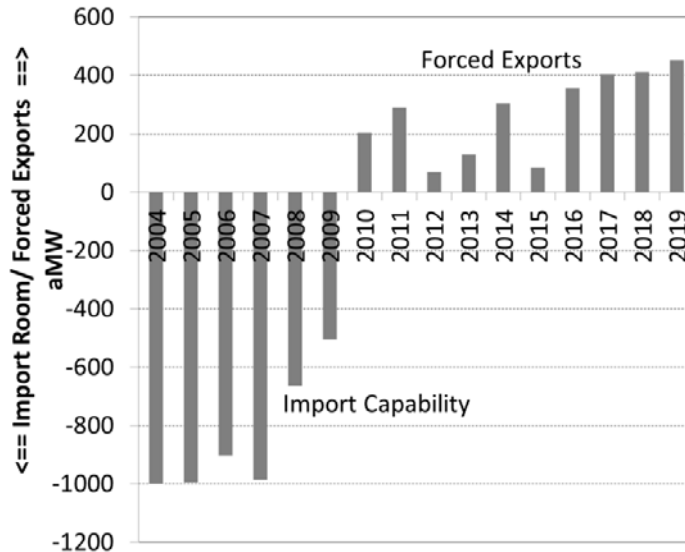


Figure 6 Change from potential for imports to forced exports in June under average water conditions over time⁹

3.2. System Spill Risk Impacts

As previously discussed, Figure 5 shows historic average imports and exports during the freshet for peak and off-peak periods. It shows the general trend over time of BC Hydro moving from a net import regime to a net export regime during the May-July period. This trend, while tied to the recent build in the must-take freshet energy, would not be expected to substantially change large basin freshet operations. Large basin plants within the freshet will still respond to market signals, with reduced releases during low price periods, and higher releases during higher priced periods. The key difference with the additional must-take volumes will be the overall resulting net export position. Under conditions where one or both large basins are threatened with spill, and must be ramped to high generation, transmission export limits will now become a greater impediment to sustained high generation from the large basin storage plants.

Figure 7 outlines a high inflow scenario where an additional 3,000 MW of generation is required from large basin storage to mitigate spill risk. This situation can materialize when there is a sharp increase in inflow (well above forecasted), due to high precipitation in the freshet months. In recent years examples of this significant increase in inflow include:

- 2007 Water Year (February to September):
 - March Seasonal Inflow forecast was 109 per cent of average.
 - Resulting Seasonal Inflow was about 118 per cent of average.

⁹ Assumes production under average inflows for all facilities except for Kinbasket and Williston, which are assumed to run at minimum generation and store the remaining inflow. Forced exports = (system inflows + IPPs) minus (load + coordination agreement entitlement obligations + storage into Kinbasket and Williston).

- The 9 per cent increase would be the energy equivalent of about 15 feet in Williston Reservoir.
- 2011 Water Year (February to September):
 - March Seasonal Inflow forecast was 99 per cent of average.
 - Resulting Seasonal Inflow was about 112 per cent of average.
 - The 13 per cent increase would be the energy equivalent of about 21 feet in Williston Reservoir.
- 2012 Water Year (February to September):
 - March Seasonal Inflow forecast was 106 per cent of average.
 - Resulting Seasonal Inflow was about 123 per cent of average.
 - The 17 per cent increase would be the energy equivalent of about 28 feet in Williston Reservoir.

Based on average loads and must-take energy around 2006, an increase in 3,000 MW of generation from the large basins (to avoid spill) would result in just over a 2,000 MW net export from the BC Hydro system. By 2018, with average loads and must-take energy shifting the base Load-Resource balance to a 400 aMW surplus position, an increase in 3,000 MW of generation from the large basins would result in about a 3,400 MW net export from the BC Hydro system. This level of export would however likely not be attainable due to export transmission limitations. As such, either generation from the large basins would need to be reduced (increasing spill at the projects), or generation from a must-take project within the BC Hydro system would need to be reduced, with the associated spill.

Under this condition there must either be an elevated risk of spill at the storage project due to inability to release from the large basin, or a deeper draft of system storage to mitigate the spill risk. System operators will be guided by risk neutral modeling¹⁰ to determine the appropriate tradeoff between system head losses and spill risk.

The resulting physical operation of the storage basin would be expected to see some additional draft of storage, coupled with some increase in spill risk. The financial and environmental impacts of these operational changes have not been assessed; however, they are not expected to be substantial.

¹⁰ Risk neutral modeling assumes each modeled possible outcomes is equally likely (i.e., it does not bias towards or against favourable or unfavourable outcomes).

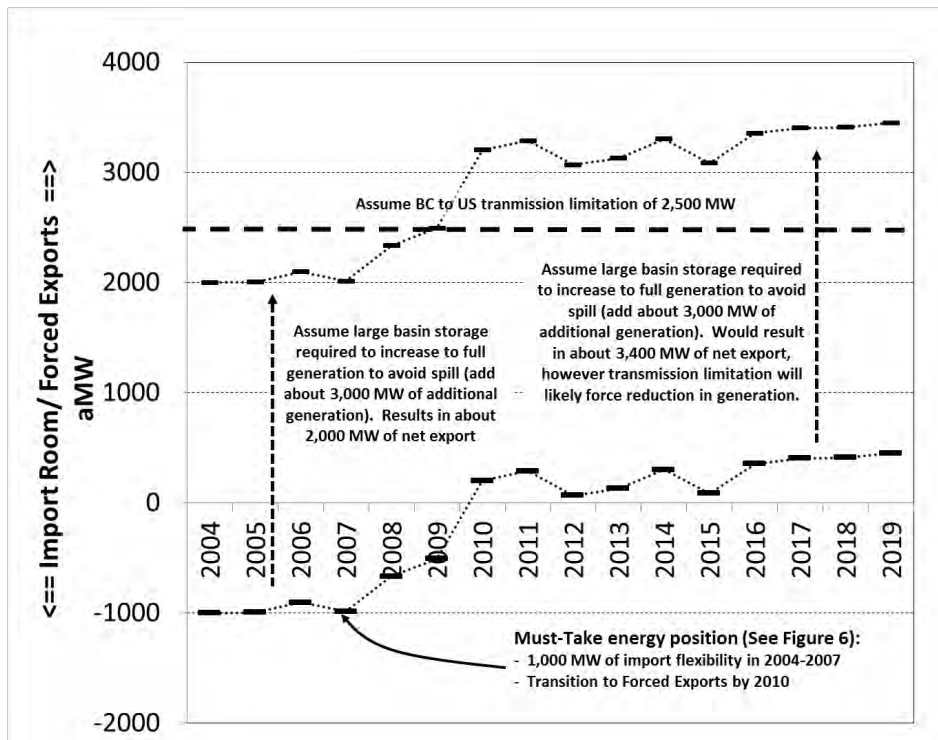


Figure 7 Impact on Net Trade Position in June due to combination of must-take energy and large basin generation required to avoid spill (shapeable generation)

3.3. Estimated Magnitude of Surplus

BC Hydro has estimated the magnitude of freshet surplus through a two stage, heuristic model,¹¹ for the BC Hydro system on an hourly basis from 2006 to 2016 (May through July). Figure 8 shows the hourly simulation results comparing system minimum energy and the load¹² for the BC Hydro integrated system for a single month (June 2016). It shows that the hourly system minimum energy exceeds the integrated system load in many hours, which results in a system surplus (i.e., when the shaded generation area is above the black load line).

These surplus quantities must either be exported or spilled. System surplus is exported when a net revenue gain would be realized and export capability exists. However, at times when market prices are

¹¹ A two stage heuristic model is a rules based model that solves the problem in two stages. The model first calculates the amount of must-take generation in each hour for the integrated system as well as monthly shapeable generation volumes. Shapeable generation volumes are based on historic actual operation (i.e., historic month end elevations are used). It then uses the difference between hourly must-take generation and load, as well as market prices, to determine the hourly timing for shapeable generation.

¹² The hourly B.C.-integrated system load includes FortisBC load is shown because BC Hydro operates Fortis' plants and the energy contribution from these plants is included as generation.

below the cost of wheeling and losses (approximately \$7.50 CAD/MWh¹³), the energy is assumed to be spilled to avoid exports that would result in a financial loss on the export transaction.

Summing the hourly surplus across the entire freshet yields the total freshet generation surplus each year as shown in Figure 9. The surplus is broken out by exports and spill. It can be seen that surplus volumes are directly correlated to inflow volume during the freshet. Most of the spill in Figure 9 would be classified as economic spill as it occurred in order to avoid exports resulting in a financial loss. However, some of the spill also occurs because transmission line capacity was reached and no additional energy could be exported.

Figure 10 highlights the number of hours the system was calculated to be in surplus for each year. Similar to surplus volumes, significant variability exists between years due to variations in inflow; however, in 2013 and 2014, which were near average water years, 40 per cent or more of hours were in surplus while in 2006 and 2008, which had similar inflow levels, less than 20 per cent of hours were in surplus.

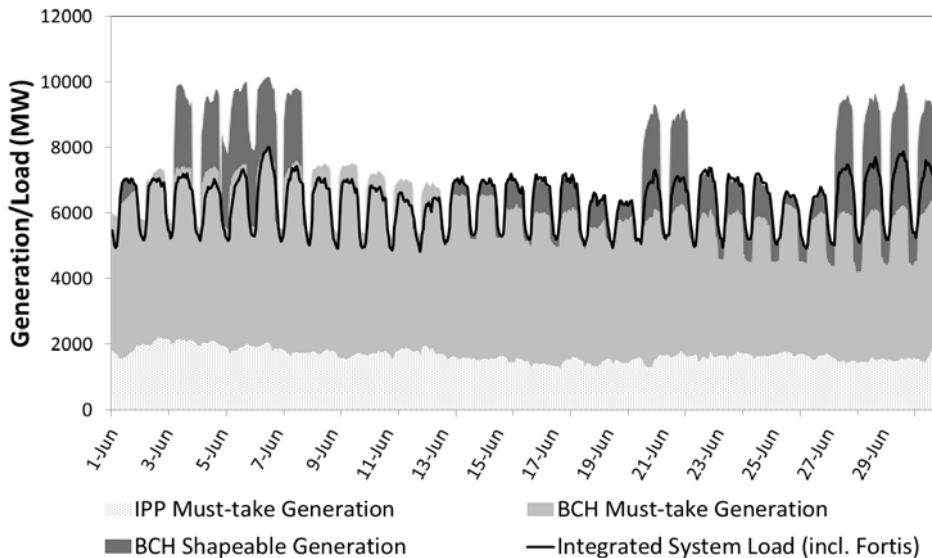


Figure 8 Example of Simulated Must-take and Shapeable Generation for June 2016

¹³ Assuming 1CAD = 0.75USD.

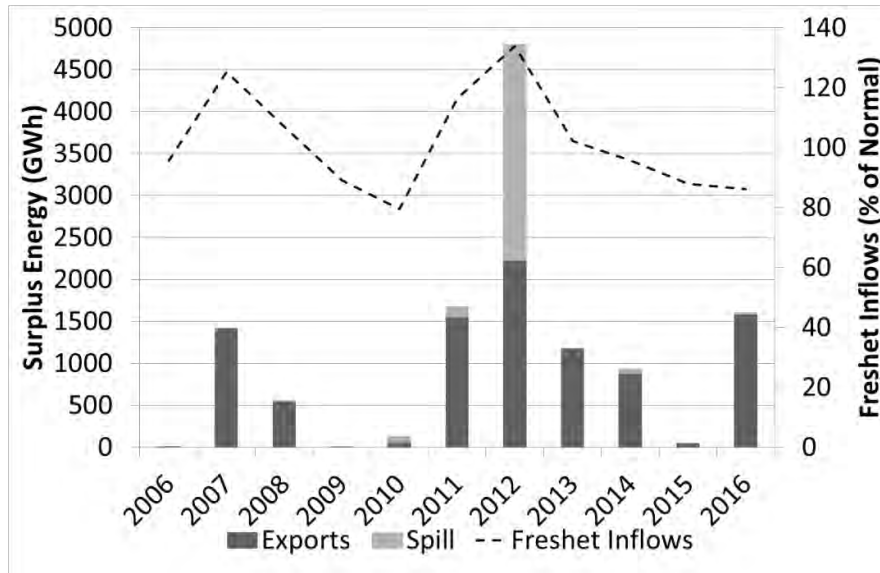


Figure 9 Calculated Surplus Generation Volumes during the Freshet for the BC Hydro Integrated System, Years 2006 to 2016

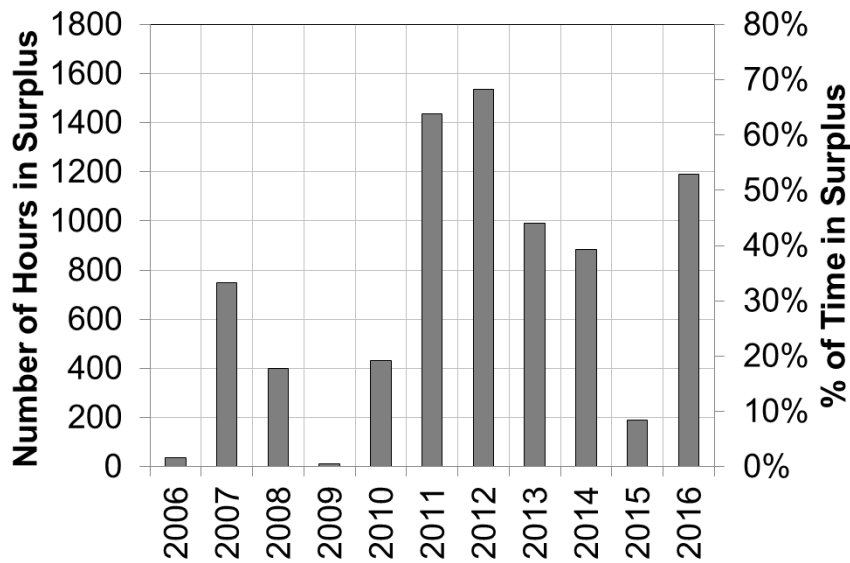


Figure 10 Calculated Number of Hours and Percent of time in Surplus during the Freshet for the BC Hydro Integrated System, Years 2006 to 2016

4. Value of Freshet Energy and Flexibility

4.1. Electricity market prices

The majority of the BC Hydro/Powerex electricity trade transactions takes place in, or passes through, the Mid Columbia (Mid-C) market located in the US Pacific Northwest. Prices at the Mid-C market are generally the lowest during the freshet period and have declined over the years and seen negative freshet prices at times in recent years, as can be seen in Figure 11. The Pacific Northwest also has freshet energy oversupply conditions similar to B.C. The oversupply is primarily due to heavy generation at US hydroelectric plants on the Columbia River (also driven by snowmelt runoffs) and low loads. Over the last ten years, the addition of about 5,000 MW of wind generation in the U.S. Pacific Northwest with large output during the spring together with production tax credits has further depressed the freshet prices (to sometimes negative prices during off-peak hours¹⁴ of the freshet period).

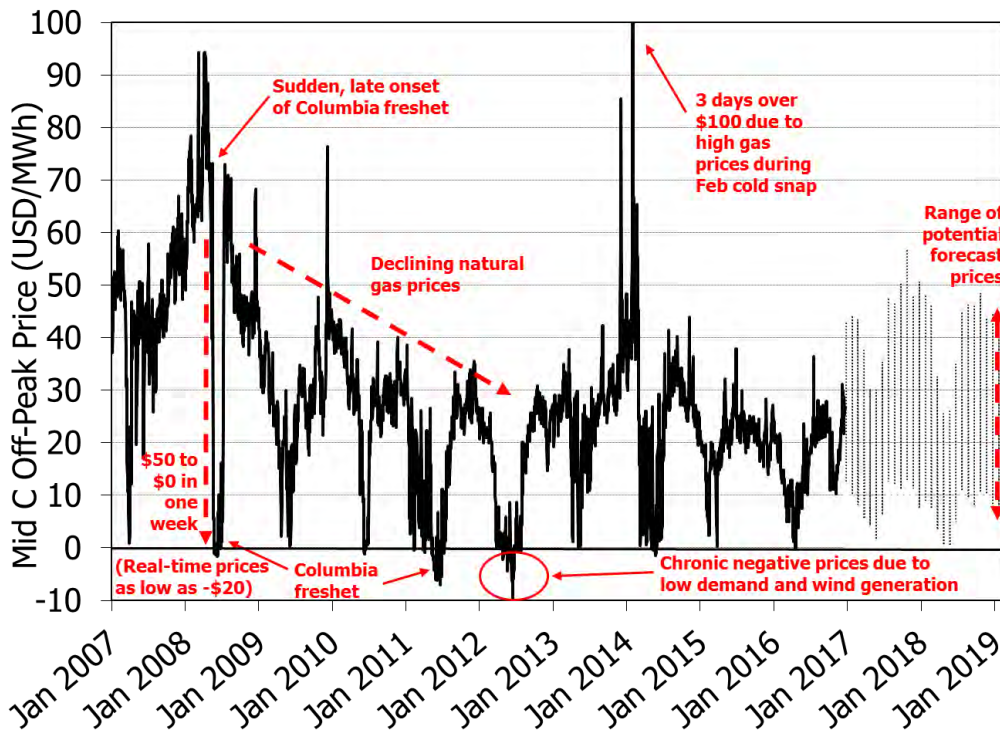


Figure 11 Mid-C Off-Peak Historic Daily and Forecast Monthly Index (Pre-Schedule) Prices (January 2007 to March 2019)

While the timing of the freshet period and the magnitude of freshet inflow varies from year to year, it is a recurring annual condition generally depressing prices to varying degree and duration whenever it

¹⁴ Peak hours (i.e., heavy load hours) are the 16-hour period between 6 a.m. to 10 p.m. (Monday – Saturday) and off-peak hours are the eight-hour period from 10 p.m. to 6 a.m. (Monday – Saturday), and all day Sundays and holidays.

comes. It should be noted that while the lowest market prices don't always happen May through July, May through July is the period of highest system minimum generation in the BC Hydro system as shown in Figure 3.

Figure 12 below shows historical average monthly Mid-C peak and off-peak prices for the years 2006 to 2016. In most years the freshet period has the lowest prices, especially in off-peak periods. In 2015, the freshet inflows in the US Pacific Northwest arrived early, depressing prices as early as February. In dry years such as 2009, less hydroelectric generation in the Pacific Northwest leads to less depression of market prices, or depression for a shorter period of time.

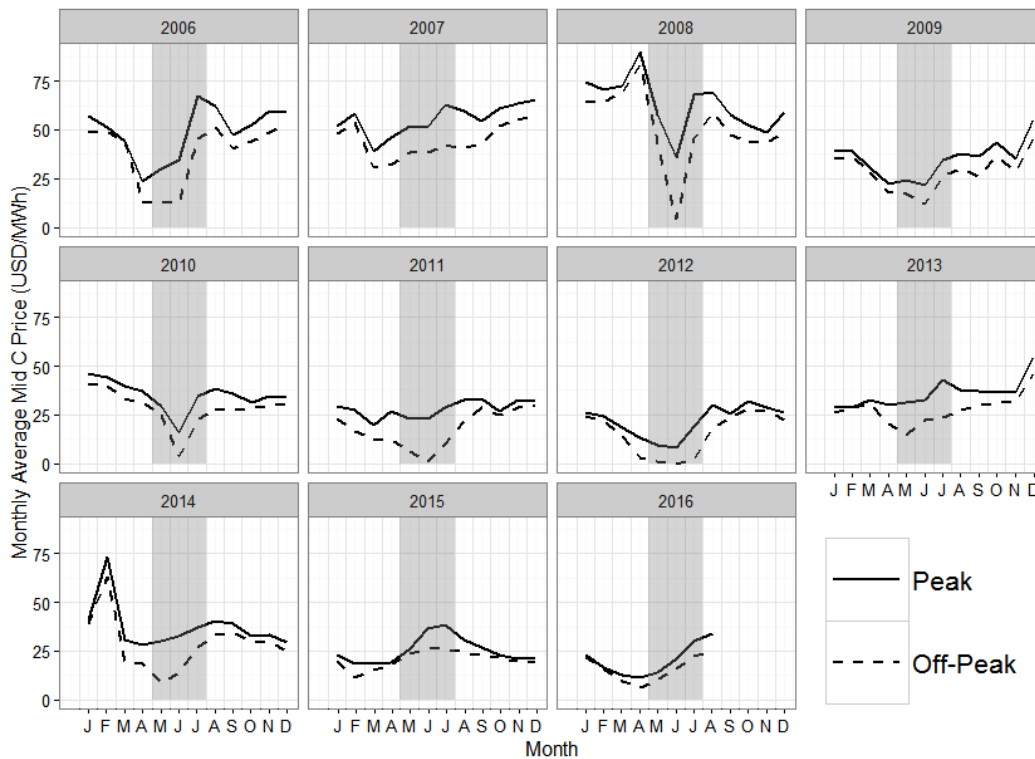


Figure 12 Historic Monthly Average Peak and Off-Peak Electricity Prices at Mid-C (\$US Nominal), 2006-2016

4.2. Energy Valuation

The calculated surplus freshet energy quantities for the years 2006 to 2016 were valued as part of the same heuristic modelling described in section 3.3. Surplus energy that could be exported economically and physically (i.e., Mid-C prices were above wheeling costs and sufficient transmission capacity existed) were valued at the BC sell price while spill was given a value of zero.

Figure 13 shows the value of must-take surplus on a \$/MWh basis. As expected, the surplus values are directly linked to freshet market prices; however, the average unit value of surplus must-take energy is consistently below average BC sell price. The average value shown in this figure has not been reduced to

reflect (1) the opportunity cost associated with BC Hydro’s reduced ability to import low cost or negatively priced electricity during freshet (especially during off-peak hours) and sell it for a higher price, either during peak hours or after the freshet, and (2) the potential capital or maintenance costs associated with high levels of spill.

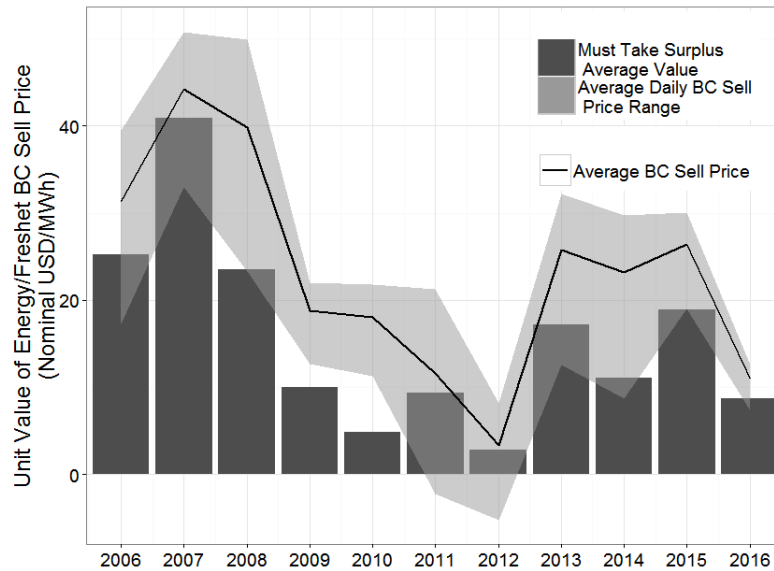


Figure 13 Calculated unit value of historic freshet surplus generation for BC Hydro Integrated System, Years 2006 to 2016

As previously discussed, with the significant increase in must-take generation in the system over the last ten years with little freshet load growth, the average June import room has diminished from about 1,000 aMW to an anticipated surplus of about 400 aMW (Figure 6). This has had significant impact on marketing of energy within the freshet, resulting in:

- The requirement that BC Hydro export the surplus into the same low priced power markets, and
- The loss of the market opportunity for BC Hydro to import low priced freshet energy from outside the province and carry this energy into the fall/winter period.

With the recent transition of the system to a forced export position (under System Minimum Generation conditions), this surplus must be sold (salvaged) as it is delivered. A reasonable estimate of the salvage value is based on the June sale price of approximately 15 CAD/MWh (including transmission costs).

- **Salvage value of 400 aMW of surplus exports (2018): 4.3MCAD**
 $400 \text{ aMW} \times 30 \text{ days} \times 24 \text{ h} \times 15 \text{ CAD/MWh} = 4.3 \text{ MCAD}$

Prior to the procurement of large volumes of freshet must-take energy, BC Hydro would use system storage to absorb low priced freshet energy, and effectively release this energy in the fall/winter to capitalize on the seasonal price differential of energy. The estimated value of this lost marketing

opportunity can be estimated using the following assumptions: (1) that October market prices are representative of the marginal value of energy in the BC Hydro system, and (2) the spread between June and October is indicative of the lost opportunity. This spread is typically about 10 CAD/MWh. As such, an order of magnitude estimate of the lost energy shaping opportunity for 1,000 aMW (72 GWh) of June import flexibility would be about 7.2 MCAD.

As noted previously, it is expected that the most significant oversupply condition during the freshet occurs in June, but typically there are impacts in the second half of May and as well as early July. As such, we may estimate that the overall financial impact of the loss of import room is about twice what is shown above.

5. Mitigation Measures Status Update

Over the next decade, we expect the market prices during freshet to stay low (below \$25 USD/MWh levelized [\$2016]¹⁵), and freshet energy in our system to continue to grow. Site C, while being the most cost effective option to provide energy and capacity to our system, will also contribute additional freshet energy, though small relative to its annual energy production due to upstream regulation provided by Williston and Peace Canyon reservoirs. As a result, we expect the tools to optimize operations during freshet would continue to result in benefits to the system.

BC Hydro is implementing a number of strategies to increase the value of the freshet energy from its portfolio of resources. In addition to optimizing the system through operational measures, we recognize that there is value in strategically limiting must-take freshet energy or increasing freshet load. BC Hydro's acquisition strategy going forward needs to reflect the low value of incremental freshet energy and the relatively higher value of resources with seasonal storage capability.

In addition to the Freshet Rate Pilot, BC Hydro has pursued a number of these actions or strategies as described below:

5.1. System Operation Measures

As discussed above, the large reservoirs in the BC Hydro system are drafted to absorb freshet inflows while maintaining minimum generation. As must-take generation has increased over the last ten years, drafts at the large basins have been adjusted to account for the increases in must-take energy, and reduction in low cost imports. However, these reservoirs cannot fully capture all the must-take energy on an hour-by-hour or daily basis due to real time operating constraints and minimum generation required.

¹⁵ Based on ABB Group Spring 2016 WECC Power Reference Case Mid Columbia price forecast.

5.2. IPP Time of Delivery Adjustments

Many of BC Hydro’s IPP Electricity Purchase Agreements include a provision that adjusts the IPP payment price for energy volumes depending on the period of the day (super-peak¹⁶, peak and off-peak) and the month delivery. For example, this provision was included in the standard form Electricity Purchase Agreements for the Fiscal 2006 Open Call for Power, the Clean Power Call and the Standing Offer Program. This provision is intended to encourage IPPs to build and operate projects that deliver energy at times which better meet our system need. Figure 14 below shows our current monthly time of delivery price multipliers provided in the Standing Offer Program standard form Electricity Purchase Agreement. The lower freshet multipliers shown in Figure 14 reflect the lower value BC Hydro places on freshet deliveries. In comparison, energy delivered during winter months in super-peak hours receives the highest adjustments. The time of delivery adjustment table is being reviewed with the aim to incent projects with generation profiles that better match current system need.

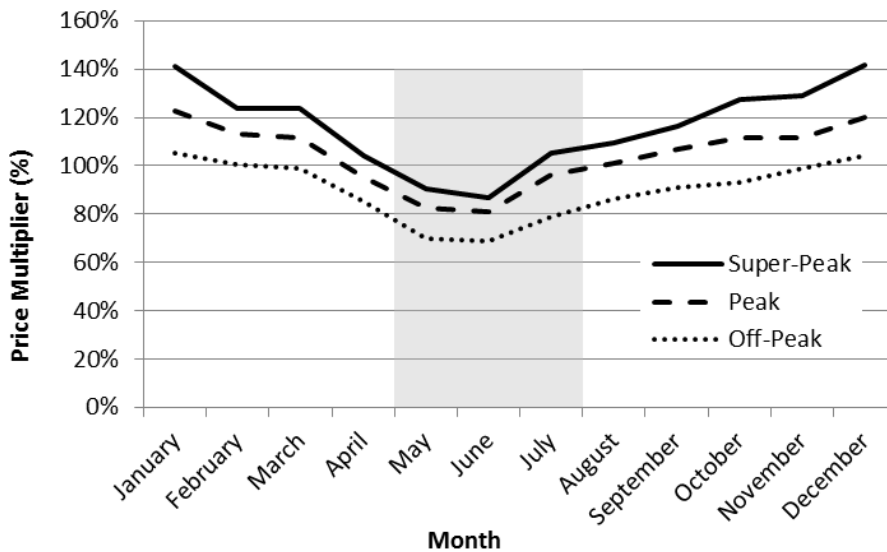


Figure 14 Monthly Time of Delivery Price Multiplier for Standing Offer Program standard form Electricity Purchase Agreement (as of December 1, 2016)

5.3. IPP Turn Downs

Many of BC Hydro’s IPP Electricity Purchase Agreements include a provision that provides BC Hydro with the right to request an IPP to turn down or reduce its generation output for a certain period of time, subject to the operating constraints of the generating facility. During a turn down, BC Hydro avoids the

¹⁶ In the time of delivery adjustments, super-peak hours fall in the four-hour period from 4 p.m. to 8 p.m. (Monday – Saturday), peak hours are the 12-hour period from 6 a.m. to 4 p.m. and 8 p.m. to 10 p.m. (Monday – Saturday) and off-peak hours are the eight-hour period from 10 p.m. to 6 a.m. (Monday – Saturday), and all day Sunday.

variable cost of generation. In the case of a gas-fired or biomass generating facility, a large portion of the variable cost of generation is associated with fuel. In contrast, wind and run-of-river generating facilities have much lower variable costs of generation because they use natural resources for power generation and do not incur fuel costs and thus, their variable costs of generation are low. As such, BC Hydro has been focusing on turn downs for gas-fired and biomass generating facilities because of greater cost savings.

When a biomass generating facility is turned down, the IPP saves the cost of the fuel that would otherwise be used. Under the Electricity Purchase Agreement, these fuel cost savings are passed onto BC Hydro in the form of a lower unit energy price which is intended to cover only the IPP's fixed cost of generation during the period that the facility is turned down.

By exercising its turn down right under an Electricity Purchase Agreement, BC Hydro may be able to realize cost savings and reduce the amount of surplus energy in the system and avoid exports or spill caused by additional must-take generation. In 2016, BC Hydro had 42 Electricity Purchase Agreements with economic turndown rights for resources on the integrated system. These turn down provisions enabled BC Hydro to reduce generation output from IPP facilities by about 770 GWh during freshet, resulting in cost savings to BC Hydro. Of the generation reduced, gas fired and biomass generation facilities contributed 70 per cent and 30 per cent, respectively, with turn-down provisions exercised at 11 Biomass projects and one thermal project. No IPP wind, energy recovery generation, municipal solid waste, hydro, or solar projects were curtailed for economic reasons in 2016. On a going forward basis, BC Hydro intends to include a turn down provision in Electricity Purchase Agreements to provide flexibility that is beneficial in periods of oversupply.

As well, within the 2007 Electricity Purchase Agreement between BC Hydro and Rio Tinto Alcan, provisions exist to reduce generation from the Kemano Project during the freshet. BC Hydro has used this flexibility to its practical extent. Key issues that preclude BC Hydro from using this flexibility further or more often include (1) restrictions due to downstream flood risk, and (2) high likelihood that any energy stored into the Nechako Reservoir (already paid for by BC Hydro) would be spilled.

5.4. Standing Offer Program Optimization

The Standing Offer Program is undergoing a review, referred to as the "SOP Optimization process", to ensure that the acquisition program reflects future system needs and is aligned with BC Hydro's 10 Year Rates Plan. The SOP Optimization process was initiated as part of collaboration between Clean Energy BC, First Nations, the Ministry of Energy and Mines, the Ministry of Forests, Lands and Natural Resource Operations, and BC Hydro.

The scope of the SOP Optimization process involves a range of activities, including an assessment of how BC Hydro can refine the program to encourage the development of resources that will provide dependable capacity to BC Hydro's system, and projects that will have an energy delivery profile that better matches BC Hydro's system needs.

These activities within the SOP Optimization process will lead to improvements in the program that will more closely align any new incremental surplus freshet energy with its value.

5.5. Conclusions

This paper has shown that over the past ten years in particular, BC Hydro's system operations have changed as a significant addition of clean variable energy has been acquired in a period with little load growth and an economic downturn in several commodity sectors. The system that BC Hydro has built, acquired and committed to is a sunk cost and BC Hydro has been operating its system to optimize the value of the available resources.

Over the years, BC Hydro's system has transitioned from a net importing position to a net exporting position during freshet. System flexibility that allows for trade benefits has been eroding and our ability to take in more freshet energy is increasingly limited, with about 40 per cent of the hours over freshet period being in surplus under average water condition. The average value of this surplus is lower than market price because of transmission costs and, at times, spill (due to export transmission constraints or market prices that are uneconomic for export).

While BC Hydro has undertaken competitive acquisition programs and acquired the most cost effective resources that were available at the time including during the freshet period, it is now in a position that it needs to evolve how to value additional acquisitions. Additionally, BC Hydro continues to seek additional options, including the introduction of the freshet rate, to increase the value of the resource portfolio.



**Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18**

**Freshet Rate Pilot Final Evaluation Report
Attachment 2**

Preliminary Freshet Rate Report for Year 2



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

December 8, 2017

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)
Transmission Service Freshet Rate
Preliminary Evaluation Report for Year 2
and Application for Year 3 Extension**

Preliminary Evaluation Report for Year 2 and Timing of Final Report

BC Hydro writes to submit the Transmission Service Freshet Rate Preliminary Evaluation Report for Year 2 (**Year 2 Report**), in compliance with Direction 2 of Commission Order No. G-17-16.

BC Hydro offered Rate Schedule (**RS**) 1892 (Freshet Rate) as a two-year pilot. Year two of the pilot ran from May 1, 2017 to July 31, 2017. BC Hydro considers that year two of the pilot was successful in terms of customer participation, incremental energy sales and positive ratepayer impact based on preliminary results. Table 4-4 on page 16 of the Year 2 Report shows that customer participation and energy sales were higher in year two, but due to lower average unit cost of market-priced energy in year two, the Freshet Rate gross revenue was approximately the same as in year one (\$4 million). The ratepayer benefit impact is comparable in the two years before adjustment for load-shifting (\$2.3 million in year one and \$2.2 million in year two). Customer participants also provided feedback that they were satisfied with the Freshet Rate and viewed it as an opportunity to produce additional volume(s) of product at lower cost.

As outlined in BC Hydro's 2015 Rate Design Application (**RDA**), the final evaluation report is due to be filed with the Commission in spring 2018.¹ BC Hydro is proposing an

¹ The timing of the three Freshet Rate Evaluation reports is set out in the table on page 7-44 of the 2015 RDA.



December 8, 2017
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Transmission Service Freshet Rate
Preliminary Evaluation Report for Year 2
and Application for Year 3 Extension

Page 2 of 3

extension to file the final evaluation report from spring 2018 to fall 2018. The extension would allow sufficient time for data for the load-shifting analysis for year two to be collected and analyzed. This timing is similar to that for the load-shifting analysis undertaken for year one of the pilot which was completed in fall 2017 consistent with the timing set out in the 2015 RDA.² The year one load-shifting results are contained in the attached Year 2 Report.

Further, as outlined below, BC Hydro is also requesting a one-year extension of the pilot. If approved, BC Hydro proposes to also include preliminary evaluation results for year three in the final evaluation report (but without the load-shifting analysis for year three given the timing constraints) in fall 2018.

Application for One-Year Extension of the Freshet Rate

BC Hydro hereby applies for approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, for an one-year extension of the termination date of the Freshet Rate. The Freshet Rate under RS 1892 was originally proposed as a two-year pilot in BC Hydro's 2015 RDA and was approved by Commission Order No. G-17-16. It will terminate on December 31, 2017. If the extension requested is granted, RS 1892 will instead terminate on December 31, 2018. All other terms and conditions under RS 1892 will remain the same.

BC Hydro is applying for the one-year extension based on the following reasons:

- BC Hydro believes that the extension is supported by the evaluation results to date, which show that there have been significant ratepayer and participant benefits from the implementation of the Freshet Rate. The Year 2 Report contains a revised year one ratepayer impact benefit of \$2.0 million, which incorporates the results of the load-shifting analysis based on year one data. It also reports a preliminary ratepayer benefit of \$2.2 million for year two.
- The Freshet Rate is expected to continue to provide ratepayer and participant benefit in the third year if market conditions are similar to those experienced during the two-year pilot. A third year of results would provide additional information to help inform the development of an on-going rate.
- BC Hydro has consulted extensively with its transmission service customers and the Association of Major Power Customers of BC, who are supportive of extending the Freshet Rate for a third year.

² The 2015 RDA timing is that the load-shifting analysis for year one would be included in the evaluation report for year two, which would be filed in fall 2017.



December 8, 2017
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
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Preliminary Evaluation Report for Year 2
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Page 3 of 3

- In the absence of an extension, BC Hydro would not be able to offer a rate for the 2018 Freshet Period. This is because: (1) any application for an on-going rate would first require the final evaluation report to be completed, inclusive of the year two load-shifting analysis; (2) stakeholder consultation is required in the event there is a recommendation that the Freshet Rate be made on-going in accordance with directive 5 of Order No. G-17-16; and (3) sufficient time is required to allow for a regulatory process. Accordingly, an one-year extension would bridge the 2018 Freshet Period with a possible application for an on-going rate to follow.

BC Hydro is not proposing a regulatory process for its request to extend RS 1892 for one additional year (terminating on December 31, 2018) and to extend the filing date of the final evaluation report from spring 2018 to fall 2018.

As mentioned above, besides the change in termination date, there are no other changes to the terms and conditions of RS 1892. The rationale for establishing the Freshet Rate pilot was debated in the 2015 RDA, has been accepted by the Commission, and continues to provide the basis for a third year of the pilot. There is broad transmission service customer and industry support for the one year extension.

The following attachments are provided:

Attachment 1 – Draft Order;

Attachment 2 – Updated tariff pages, clean and black-lined versions; and

Attachment 3 – Year 2 Report.

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

ac/ma

Enclosure

Copy to: BCUC Project No. 3698781 (2015 RDA) Registered Intervener Distribution List.



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TF: 1.800.663.1385
F: 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)
Transmission Service Freshet Rate Pilot
Application for Year 3 Extension (the Application)

BEFORE:

Commissioner
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. As part of the 2015 Rate Design Application filed on September 24, 2015, BC Hydro sought approval for a new optional rate schedule (RS) 1892 – Transmission Service - Freshet Energy, which provides participating customers market pricing for incremental consumption during the freshet period (May 1 to July 31 inclusive) on a pilot basis ending December 31, 2017 (the Freshet Rate Pilot). RS 1892 was approved by Commission Order No. G-17-16. BC Hydro was also ordered to file three evaluation reports of the Freshet Rate Pilot: two preliminary reports and one final report;
- B. In compliance with Commission Order No. G-17-16, BC Hydro filed its preliminary evaluation report for year one on December 8, 2016 (Appendix D to the report was filed on January 27, 2017);
- C. On December 8, 2017, BC Hydro filed its preliminary evaluation report for year two in compliance with Commission Order No. G-17-16.
- D. On December 8, 2017, BC Hydro, along with the submission of its preliminary evaluation report for year two, applied for approval, pursuant to sections 58 to 61 of the *Utilities Commission Act*, for extension of the termination date of RS 1892 - Transmission Service - Freshet Energy to include a third year so that the rate schedule will now expire on December 31, 2018;
- E. BC Hydro also proposed to extend the timeline for filing the final Freshet Rate Pilot evaluation report from spring 2018, as outlined in the 2015 RDA, to fall 2018.

.../2

NOW THEREFORE the Commission, pursuant to sections 58 to 61 of the Utilities Commission Act, orders as follows:

1. The termination date of the Freshet Rate Pilot is extended for one year. Rate Schedule 1892 will terminate effective December 31, 2018; and all other terms and conditions of Rate Schedule 1892 remain.
2. The amended RS 1892 – Transmission Service - Freshet Energy as shown in Attachment 2 of the Application is approved effective May 1, 2018.
3. BC Hydro shall submit the final evaluation report for the Freshet Rate Pilot in fall 2018.

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



**Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16
Directive 3**

Attachment 2

**Updated Tariff Pages
Clean and Black-lined**

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"> 1. The greater of <ol style="list-style-type: none"> (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 2. 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"> 1. Freshet Period May 1 to July 31 inclusive.

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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.

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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.

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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.

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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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- | | |
|--|--|
| | <p>5. Electricity under this Rate Schedule will not be available to a Customer if:</p> <ul style="list-style-type: none">(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, 2017 or 2018. <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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	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.

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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 <u>8</u> .
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"> 1. The greater of <ol style="list-style-type: none"> (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 2. 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"> 1. Freshet Period May 1 to July 31 inclusive.

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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.

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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.

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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 <u>and 2018</u> 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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5. Electricity under this Rate 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~~ or 2018.
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.
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.
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.
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.

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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



**Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16
Directive 3**

Attachment 3

Preliminary Evaluation Report for Year 2



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Appendices

- Appendix A Freshet Baseline Application (April 26, 2017) Public Version
- Appendix B Customer Feedback Questions



1 Executive Summary

BC Hydro's Rate Schedule 1892 – Transmission Service – Freshet Energy (**Freshet Rate or Rate Schedule (RS) 1892**) was approved on February 9, 2016 by Commission Order No. G-17-16 for a two-year pilot (**Freshet Pilot or Pilot**), with the rate effective from February 9, 2016 to December 31, 2017.

The Commission directed BC Hydro to file three evaluation reports to assess whether the Pilot has met its objectives (i.e., a preliminary evaluation report for each of Year 1 and Year 2, plus a final evaluation report). BC Hydro filed its evaluation report for Year 1 on December 8, 2016.¹ This evaluation report contains preliminary results for the 2017 Freshet Period (Year 2) and includes BC Hydro's analysis of load shifting for the 2016 Freshet Period (Year 1), which adjusts the results previously reported for Year 1. This report reflects information available as of November 2017.

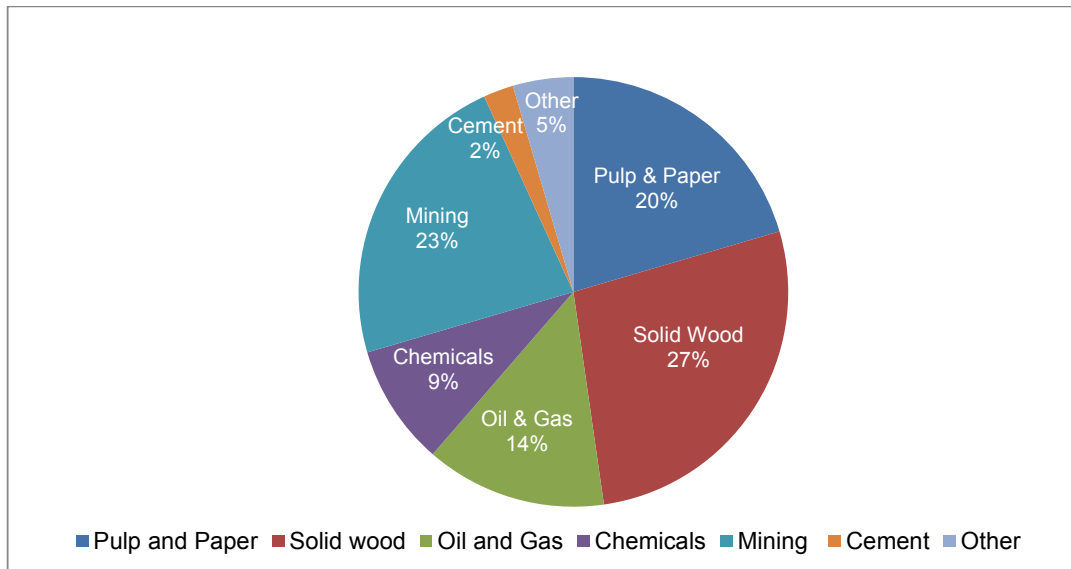
BC Hydro considers that Year 2 of the Pilot was successful in terms of customer participation, incremental energy sales and positive ratepayer impact based on preliminary results. Customer participants provided feedback that they were satisfied with the rate and viewed it as an opportunity to produce additional volume(s) of product at lower cost.

1.1 Year 2 Participation

Forty-four unique transmission customer sites from across the province participated in Year 2 of the Pilot. This reflects an increase from 39 participating sites in Year 1 and includes eight sites for which Year 2 was their first year of participation. Three sites from Year 1 did not participate in Year 2: (1) one site was shutdown; (2) one site had plant changes that would have required an engineering assessment to determine an appropriate baseline change; and (3) one site opted not to participate based on their assessment of no incremental consumption potential.

¹ Appendix D "BC Hydro System Conditions during Freshet and Associated Management Strategies" of the report was filed with the Commission on January 27, 2017.

- 1 Overall, this level of participation reflects approximately 30 per cent of eligible sites in
 2 the entire RS 1823 customer class. Customer participants represented a broad
 3 cross-section of industry sectors as shown in the chart below.



- 4 BC Hydro considers that customer participation for Year 2 was successful. Similar to
 5 the feedback provided for Year 1, customer feedback for Year 2 indicated that the
 6 sign-up process for the Pilot was straight-forward (i.e., provide notice by March 1 in
 7 accordance with Special Condition 3 of RS 1892) and that the 'opt-out' provision of
 8 the rate (i.e., the ability to cancel supply at any time prior to July 31 in accordance
 9 with Special Condition 6 of RS 1892) helped to de-risk their participation.

10 1.2 Electricity Baseline Determination

- 11 Each of the 44 participant customer sites had electricity baselines (i.e., HLH Baseline,
 12 LLH Baseline and Reference Demand) determined in accordance with RS 1892. For
 13 Year 2, four customer sites had baselines that required adjustment pursuant to
 14 Special Condition 4 of RS 1892. BC Hydro filed the agreed-to baseline adjustments



1 with the Commission for review. The adjusted baselines were approved by
2 Commission Order No. G-77-17 on May 18, 2017.

3 The purpose of the customer-specific electricity baselines is to separate incremental
4 RS 1892 electricity purchases from RS 1823 electricity purchases during the
5 2017 Freshet Period. BC Hydro considers that the electricity baseline determination
6 process was both well-understood and well-supported by customers. Specifically,
7 customers provided feedback that the process was clear and the electricity baselines
8 determined were fair.

9 **1.3 Year 2 Results**

10 Of the 44 participating customer sites, 32 had Net Freshet Energy as defined under
11 RS 1892. RS 1892 electricity sales and gross revenue for the 2017 Freshet Period
12 are summarized below:

- 13 • Total RS 1892 energy volume: 168,399 MWh;
- 14 • Total RS 1892 energy sales: \$3.3 million;
- 15 • Total wheeling charges: 168,399 MWh x \$3.00/MWh = \$0.5 million;
- 16 • 5 per cent Rate Rider on RS 1892 energy sales and wheeling charge: \$0.2
17 million; and
- 18 • **Gross RS 1892 revenue: \$4.0 million (excluding taxes).**

19 **1.4 Energy Pricing and Billing**

20 The average weighted market price paid for RS 1892 energy by participant customers
21 was CAD\$19.50/MWh² plus a \$3.00/MWh wheeling rate and 5 per cent rate rider, for
22 a total delivered energy price of CAD \$23.63/MWh before taxes. This compares to a
23 total delivered energy price of CAD \$29.27/MWh for Year 1.

² The actual price of RS 1892 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Freshet Energy.



1 Mid-C market prices were significantly lower in Year 2 than Year 1 due to above
2 average water inflows in the US Columbia system. In mid-March, the combination of
3 high snowpack levels and heavy rains resulted in flood levels on the Columbia river in
4 Portland. Pend D'Oreille river flows also increased early, resulting in an early increase
5 of must-run generation at BC Hydro's Seven Mile Dam and Waneta Dam further
6 downstream.

7 Collectively, these events contributed to energy market price softening from
8 approximately mid-March to the end of June. In fact, there were a total of 24 days
9 during the 2017 Freshet Period where the market price of LLH energy was negative
10 such that the energy charge floor price of \$0/MWh under RS 1892 was applied. By
11 early July, market prices returned to more typical values as US Columbia river flows
12 returned to seasonally normal levels and warmer temperatures were experienced in
13 the Pacific Northwest (which typically trigger an increase in air conditioner load).

14 BC Hydro considers that billing for the 2017 Freshet Period electricity was
15 implemented smoothly. As in Year 1, participant customers were billed for RS 1892
16 electricity in August 2017 to allow for the Freshet Period reconciliation of HLH and
17 LLH Net Freshet Energy. Participant customers were sent a daily summary by email
18 of Mid-C market prices including an estimate of the total daily price for market energy
19 in HLH and LLH net of the daily \$USD/CAD exchange adjustment, wheeling and rate
20 rider charges.

21 There was some minor confusion as to whether the statutory holiday for Canada Day
22 would be observed on Saturday July 1 (which was the first time in a decade that
23 Canada Day fell on a Saturday) or Monday July 3. This impacted the determination of
24 HLH and LLH on those days. BC Hydro proactively communicated this information to
25 customers. Otherwise, no issues or concerns with monthly invoices or the RS 1892
26 billing statements were identified.



1 1.5 Customer Actions Taken

2 Key actions taken by customers to increase load during the 2017 Freshet Period are
3 set out below:

- 4 • Higher utilization of existing production capacity;
- 5 • Production optimization (such as running equipment at full speed/maximum
6 capacity);
- 7 • Operating changes (such as by adding shifts) and grade changes (such as to run
8 a more energy intensive grade mix);
- 9 • Re-scheduling of maintenance shutdowns into non-freshet months;
- 10 • Reduction/shortening of planned downtime to maximize plant uptime (such as by
11 adding shifts to complete maintenance work faster);
- 12 • Voluntary generator turndown (such as to reduce or curtail self-generation when
13 economic); and
- 14 • Generator outage (such as when a piece of generation equipment unexpectedly
15 fails or the generating unit is taken out of service for maintenance).

16 As described in section [4](#) of this report, BC Hydro does not yet have sufficient
17 information to verify the energy consumption impact of specific actions taken by
18 customers during the 2017 Freshet Period, including potential load shifting in Year 2.
19 This analysis will be completed on a retrospective basis once the F2018 CBL annual
20 review is completed for participant customers, which is expected to be in Q3 of
21 calendar 2018.

22 1.6 Ratepayer Impact for Year 2

23 For Year 2, BC Hydro has calculated a preliminary ratepayer benefit of approximately
24 \$2.2 million. This benefit was calculated using an assessment of daily system
25 conditions and remains subject to a number of critical assumptions that will be



1 reviewed as part of BC Hydro's final evaluation report, including the assumption that
2 all RS 1892 energy volumes during the 2017 Freshet Period reflect load that is 'truly
3 incremental'. Based on its preliminary ratepayer impact estimate and current
4 knowledge of customer actions taken to increase load, BC Hydro expects that its rate
5 design principle that all ratepayers should be held harmless by the freshet rate will be
6 met for Year 2.

7 **1.7 Revised Ratepayer Impact for Year 1**

8 BC Hydro has revised the methodology used to estimate the Year 1 ratepayer impact.
9 The methodology initially used to determine Year 1 impacts (which used an
10 assessment of seasonal system conditions) has been replaced with the methodology
11 used to determine Year 2 impacts (which uses a daily assessment of system
12 conditions). BC Hydro considers the daily assessment of system conditions to be
13 more accurate. The initial estimate of Year 1 ratepayer impact as set out in the Year 1
14 report was a benefit of \$2.0 million. The revised estimate of Year 1 ratepayer impact
15 using the updated methodology is a benefit of \$2.3 million.

16 BC Hydro has also now completed its analysis of Year 1 load shifting, details of which
17 are set forth in section [4.6.4](#). BC Hydro was not able to discern any material negative
18 impacts to non-participants and all ratepayers from load shifting. A small load shifting
19 impact was identified for one customer that moved its annual maintenance shutdown
20 outside of the 2016 Freshet Period. BC Hydro also identified one circumstance
21 where RS 1892 provided a lower-cost option to RS 1880 for a customer with a forced
22 outage of their self-generation facilities. BC Hydro has assessed the combined
23 impact of these two events as a revenue loss of \$0.27 million. Accordingly, the
24 revised Year 1 ratepayer impact is a benefit of \$2.03 million, taking into consideration
25 the updated methodology and the load shifting analysis. This confirms BC Hydro's
26 view that non-participants and all ratepayers were held harmless by the Freshet Rate
27 for the 2016 Freshet Period. Refer to section [4.6.4](#) for a more detailed review of the
28 Year 1 load shifting analysis and ratepayer impact methodology change.



2 Evaluation Report Scope

This evaluation report provides preliminary results of implementing the Freshet Rate in Year 2.

Commission Order No. G-17-16 directed BC Hydro to file the three evaluation reports as described in section 7.3.4.6 of the 2015 RDA. These three reports are described in [Table 2-1](#) below which is copied from the 2015 RDA (page 7-44). The table also includes when the reports are to be submitted to the Commission.

BC Hydro filed its first evaluation report (Report A - Year 1) on December 8, 2016.³

This is the second evaluation report (Report B – Year 2) and is being filed on December 8, 2017, which meets the fall 2017 timeline.

As outlined in the cover letter accompanying this report, BC Hydro proposes that the final evaluation report (Report C) be deferred to fall 2018 to provide sufficient time for the collection of data and analysis of prospective load shifting in Year 2, similar to the timeframe for the load shifting analysis for Year 1, as described in sections [4.3](#) and [4.6.4](#) of this report.

In order to understand if customers have shifted RS 1823 energy into the Freshet Period, BC Hydro needs to assess the customer's annual energy purchases relative to their annual energy CBL and their RS 1892 energy baselines. All else being equal, a pure load shift would be identified as a decrease in annual RS 1823 energy equal to an increase in RS 1892 energy.

³ Appendix D "BC Hydro System Conditions during Freshet and Associated Management Strategies" of the report was filed with the Commission on January 27, 2017.



1 **Table 2-1 2015 RDA Evaluation Reports**

Report	RDA Proposal
Preliminary evaluation report	Report A: <ul style="list-style-type: none"> • Fall 2016 – Report take-up of the pilot in Year 1 and identify total sales and revenue under the rate. Report B: <ul style="list-style-type: none"> • Fall 2017 – Report take-up of the pilot in Year 2 and identify total sales and revenue under the rate. Report the impact of shifting in Year 1, which BC Hydro can only do at the end of F2017.
Final evaluation report	Report C: <ul style="list-style-type: none"> • Spring 2018 – summary of take-up and shifting over the two-year pilot program.⁴

2 To discuss each of the evaluation criteria described in Order No. G-17-16 and
 3 section 7.3.4.6 of the 2015 RDA, the balance of this report is organized into
 4 two sections as set out below:

- 5 • Section [3](#): Freshet Rate Pilot Year 2 Implementation; and
- 6 • Section [4](#): Year 2 Results.

7 The concordance table shown in [Table 2-2](#) below identifies the specific section where
 8 each criterion as set forth in the Order and the 2015 RDA has been addressed.

⁴ In the cover letter accompanying this report, BC Hydro has proposed to move the final report date to fall 2018.



1

Table 2-2 Evaluation Criteria Concordance

Evaluation Criteria	Section
Direction 4 of Commission Order No. G-17-16	
a) Analysis of the costs/benefits to non-participating customers, including the \$0kWh floor price, and evaluating the appropriateness of sharing additional benefits with non-participating customers;	4.6
b) The freshet rate pilot wheeling charges as compared to those that would have been collected had FortisBC Inc.'s standby rate charges been applied;	Refer to 4.5.1
c) The data, the calculations, the analysis and other considerations, if any, that went to determining each customer's baseline, each customer's freshet rate charges and each customer's RS 1823 charges;	3.3, Appendix A
d) Freshet rate engagement activities with commercial ratepayers and other ratepayer groups;	Not covered in this report, will be addressed in final evaluation report
e) Detailed information as to the extent of the potential energy oversupply issue and BC Hydro's progress on other strategies it is pursuing to mitigate the issue;	Refer to Appendix D of Year 1 Report. The final evaluation report will update Appendix D information to include Year 2 and Year 3 data.
f) All costs associated with implementing the freshet rate pilot; and	4.5.2
g) An analysis of the impact of any load shifting, including the actual monthly consumption for each pilot participant, in comparison to the respective CBLs for each.	4.3
Direction 5 of Commission Order No. G-17-16 <i>prior to filing the final evaluation report on the freshet rate pilot, BC Hydro is to consult with stakeholders on further process in the event there is a recommendation that the freshet pilot rate be made permanent.</i>	N/A for this report
Direction 6 of Commission Order No. G-17-16	
6. BC Hydro is directed to provide more clarity in its evaluations and provide more clarity as to the magnitude of the energy surplus during freshet and provide an estimate of its potential value.	Refer to Appendix D of Year 1 Report. The final evaluation report will update Appendix D information to include Year 2 and Year 3 data.
2015 RDA, section 7.3.4.6	
1. Did the rate provide RS 1823 customers with lower cost options?	4.2
2. Did the rate have positive or negative impacts on non-participating customers?	4.6
3. How many RS 1823 customers used the rate? What were the volumes of use?	4.1
4. How did customers use the rate?	1.5

**Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16 Directive 3**

BC Hydro Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18
Transmission Service Market Reference
Priced Rates Application



Evaluation Criteria	Section
5. To what extent did shifting contribute to higher freshet energy?	4.3
6. Was there any shifting within the freshet period from HLH to LLH?; and	4.3
7. Were there any issues with setting baselines, implementation, or billing?	3.3.
8. Did the pilot impact customer's conservation and efficiency measures?	Not covered in this report, will be addressed in final evaluation report
9. How quickly did customers respond to changes in market prices?	4.2
10. Did customers with aggregated RS 1823 loads shift consumption between plants to take advantage of this rate?	4.3
11. 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?	4.4
12. Was there any impact on RS 1880 events? Did customers use the rate as a substitute for RS 1880?	4.4

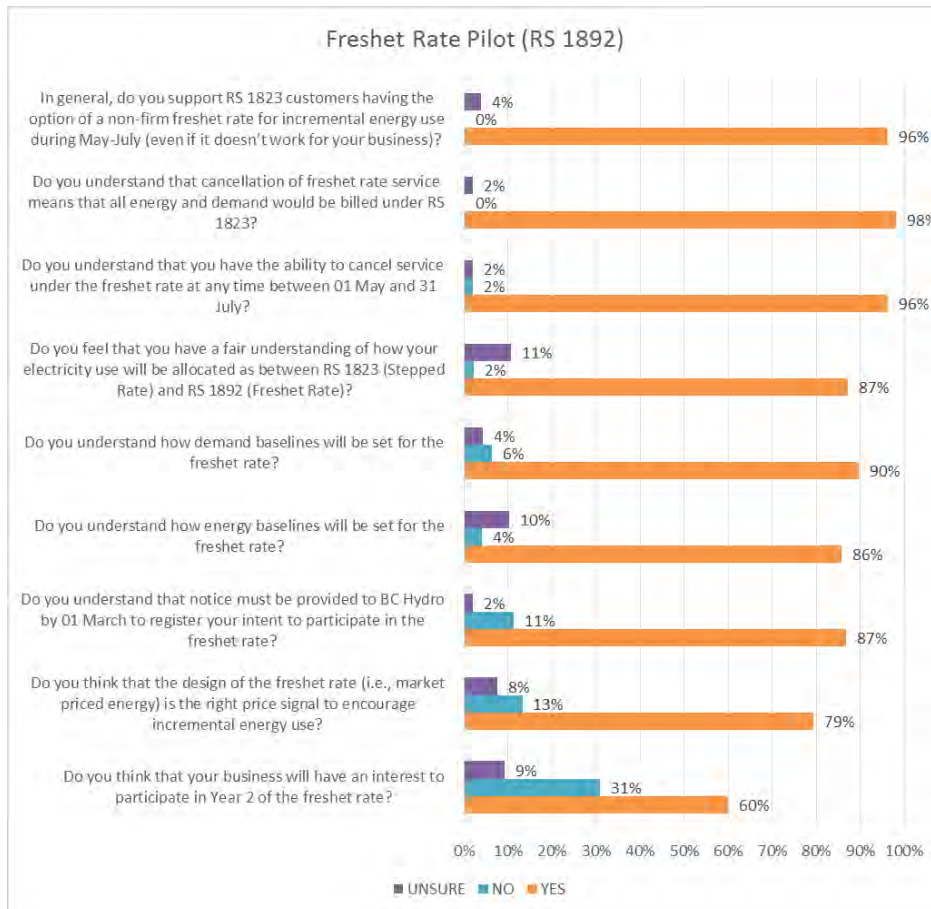


3 Freshet Rate Pilot Year 2 Implementation

3.1 RS 1823 Customer Engagement

In February 2017, BC Hydro conducted a total of six half-day workshops with transmission service customers across the province. A total of 92 customers attended the workshops, representing approximately 70 per cent of BC Hydro’s total transmission load customer sites. BC Hydro collected verbal and written feedback from customers regarding the Freshet Rate. Written feedback was consolidated and is shown in [Figure 3-1](#) below.

Figure 3-1 RS 1823 Customer Feedback on Freshet Rate



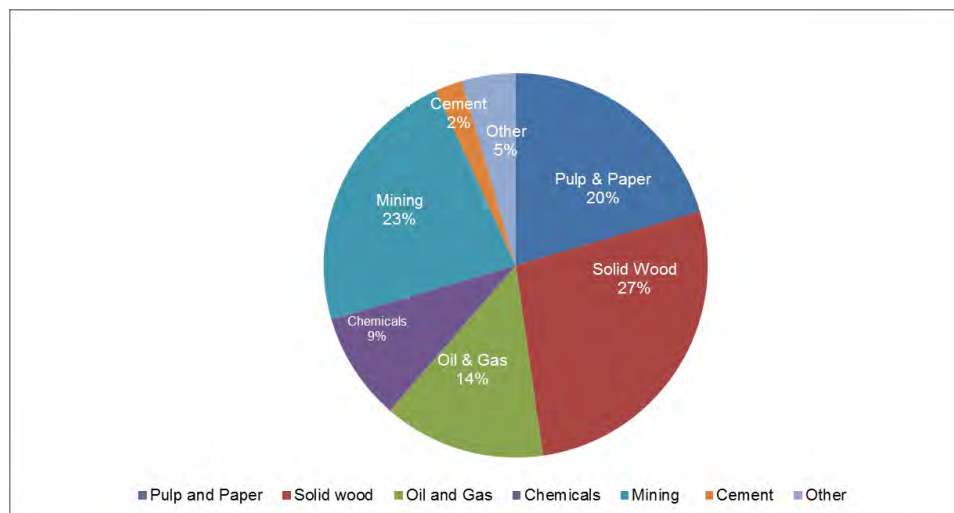
Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16 Directive 3

1 3.2 Year 2 Freshet Rate Participation

2 By March 1, 2017, a total of 46 unique RS 1823 customer sites provided written
 3 notice to BC Hydro via email of their election to take electricity under RS 1892 during
 4 the 2017 Freshet Period (Year 2) together with an estimate of their expected take of
 5 incremental freshet energy. Two customers subsequently cancelled their Year 2
 6 election after determining that they had no immediate opportunity for incremental
 7 energy use. This left 44 participant customer sites for Year 2, with a broad
 8 representation from across industry sub-sectors and regions of the province. Refer to
 9 [Figure 3-2](#) below.

10
 11

Figure 3-2 Customer Participation by Industry Sub-Sector



12 3.3 Energy Baseline and Reference Demand Determination

13 RS 1892 billing requires the establishment of individual customer site energy
 14 baselines for High Load Hours (the HLH Baseline) and Low Load Hours (the LLH
 15 Baseline) and a Reference Demand. The purpose of the energy baselines is to
 16 separate RS 1823 energy purchases from incremental RS 1892 energy purchases
 17 during the Freshet Period. The purpose of the Reference Demand is to cap the



1 participating customer's highest kV.A demand that is charged under RS 1823 during
 2 each month of the Freshet Period. There is no demand charge for load taken above
 3 the Reference Demand.

4 RS 1892 requires that electricity baselines be based on the customer's electricity
 5 consumption billed under RS 1823 of the 2015 Freshet Period. This is the default
 6 baseline determination period. However, as set forth in Special Condition 4 of
 7 RS 1892, alternative baseline determinations are allowed subject to the parties'
 8 agreement and the Commission's approval.

9 BC Hydro used the existing electricity baselines determined for Year 1⁵ for customers
 10 continuing to participate in Year 2 and determined electricity baselines for new Year 2
 11 customer participants in accordance with RS 1892. The following section describes
 12 the cases where, in determining Year 2 energy baselines and Reference Demand, an
 13 adjustment was necessary to achieve electricity baselines expected to be
 14 representative of normal expected electricity use during the 2017 Freshet Period.

15 **3.3.1 Electricity Baseline Review and Adjustment Process**

16 On April 26, 2017, BC Hydro filed four adjusted electricity baselines with the
 17 Commission pursuant to Special Condition 4 of RS 1892. The public version of this
 18 application is attached in [Appendix A](#). BC Hydro's application included evidence: (a)
 19 to explain why the standard baselines calculated in accordance with the provisions of
 20 RS 1892 were not considered representative of the customer's expected RS 1823
 21 electricity usage during the Freshet Period of 2016 or 2017; (b) to describe how the
 22 alternative energy baselines and/or Reference Demand were calculated; and (c) to
 23 confirm the customer's agreement. As set out in the application, BC Hydro identified
 24 and proposed baseline adjustments⁶ for the events listed below:

⁵ The data, the calculations, the analysis, and the process used to determine the year one baselines and Reference Demands are outlined in BC Hydro's Year 1 Evaluation Report.

⁶ Adjustments were applied to calendar 2015 Freshet Period data unless otherwise specified.



-
- 1 • **Customer-funded DSM projects in 2016 (two customer sites)** – These
 2 customers participated in Year 1 of the Freshet Pilot. RS 1892 energy baselines
 3 were decreased to remove the verified impact of new customer-funded DSM
 4 projects.
- 5 • **Indefinite shut-down in 2015 (one customer site)** – This customer did not
 6 participate in Year 1 of the Freshet Pilot. Due to shut-down in 2015, the
 7 2015 Freshet Period data was not representative of normal operations and did not
 8 reflect anticipated RS 1823 electricity purchases during the 2017 Freshet Period.
 9 Accordingly, RS 1892 baselines for this customer were determined using data for
 10 the 2016 Freshet Period.
- 11 • **New Plant Load in 2015 (one customer site)** – This customer did not participate
 12 in Year 1 of the Freshet Rate. Due to the addition of new plant load behind the
 13 customer meter commencing in August 2015, the 2015 Freshet Period was not
 14 representative of normal site operations and did not reflect expected RS1823
 15 electricity purchases during the 2017 Freshet Period. Accordingly, electricity
 16 baselines for this customer were determined using data for the 2016 Freshet
 17 Period with the new plant load in operation.

18 Details of each specific adjustment were filed with the Commission on a confidential
 19 basis to protect commercially sensitive customer information. The Commission
 20 approved the alternative energy baselines and Reference Demands by Order
 21 No. G-77-17 dated May 18, 2017. Overall, BC Hydro considers that the baseline
 22 determination process was fair, practical, efficient and well understood by customers.
 23 No material issues were identified.



4 Year 2 Results

This section describes BC Hydro's Year 2 results in accordance with the evaluation criteria set out in [Table 2-2](#) above. Where appropriate, it also includes a comparison with Year 1 results.

4.1 RS 1892 Energy Sales and Revenue

Q: How many RS 1823 customers used the rate and what were the volumes of use?

A total of 44 unique customer sites participated in the 2017 Freshet Period. Only 32 of these sites actually purchased energy under RS 1892. The remaining 12 sites purchased less energy than their RS 1892 energy baselines over the entire Freshet Period and thus all of the energy taken by these customers was deemed to be supplied under RS 1823. For the 32 sites that purchased RS 1892 energy during the 2017 Freshet Period, total RS 1892 energy sales and gross revenue are summarized in [Table 4-3](#) below:

Table 4-3 RS 1892 Energy Sales and Gross Revenue

Total RS 1892 Energy Volume	168,399 MWh
Average Incremental Load	76.3 MW ave.hr (for total of 2,208 hrs)
Total RS 1892 Energy Sales	\$3.3 million ⁷
Total Wheeling Charges	168,399 MWh x \$3.00/MWh = \$0.5 million
5 per cent Rate Rider on RS 1892 Energy Sales and Wheeling Charges	\$0.2 million
RS 1892 Gross Revenue	\$4.0 million (excluding taxes)

[Table 4-4](#) below provides a comparison of the RS 1892 energy sales and gross revenue for Year 1 and Year 2.

⁷ Reflects an average Mid-C market energy price of CAD \$19.50/MWh.

1
2

Table 4-4 Comparison of RS 1892 Energy Sales and Gross Revenue Year 1 and Year 2

	Year 1	Year 2
Number of Participant Sites	39	44
RS 1892 energy sales (MWh)	138,736	168,399
Average incremental load (MW/hr)	62.8	76.3
Average unit cost of market-priced energy (\$/MWh)	24.88	19.50
RS 1892 energy revenue (\$ million)	3.5	3.3
Plus \$3/MWh wheeling fee x energy volume (\$ million)	0.4	0.5
Plus 5% rate rider (\$ million)	0.2	0.2
Average total unit cost of market-priced energy excluding taxes (\$/MWh)	29.27	23.63
Total RS 1892 gross revenue (\$ million)	4.1	4.0

3 For Year 2 (when being compared to Year 1), the table shows that the volume of
 4 RS 1892 energy sales was higher (by about 21 per cent), but the average unit cost of
 5 market-priced energy was lower (also by about 21 per cent, summarized above in
 6 section [1.4](#)), such that total RS 1892 gross revenue in both years was approximately
 7 equal (\$4.1 vs \$4.0 million, for Year 1 and Year 2 respectively).

8 **4.2 Mid-C Market Pricing and Customer Load Response**

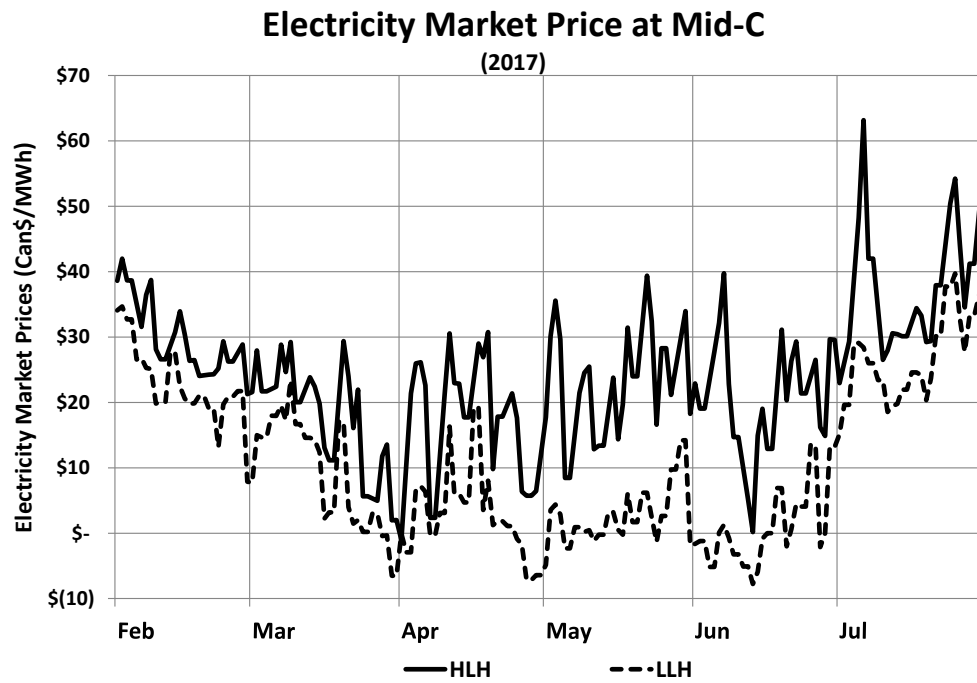
9 **Q: Did the rate provide RS 1823 customers with lower cost options?**

10 The chart below shows the average daily Mid-C market energy prices in both HLH
 11 and LLH for the 2017 Freshet Period, adjusted using the daily Bank of Canada
 12 exchange rate. Daily LLH market prices ranged from CAD \$(7.76)/MWh to
 13 \$39.72/MWh and daily HLH market prices ranged from CAD \$0.19/MWh
 14 to \$63.16/MWh.



1

Figure 4-3 Electricity Market Prices: Mid-C



2

3 For the months of May and June during the 2017 Freshet Period, the average daily
 4 price for RS 1892 energy in HLH and LLH was below the otherwise applicable
 5 price(s) for RS 1823 energy. There were a total of 24 days during the Freshet Period
 6 where the market price of LLH energy was negative such that the energy charge floor
 7 price of \$0/MWh under RS 1892 was applied. At no time during the entire
 8 2017 Freshet Period was the daily LLH market price higher than the RS 1823 Tier 1
 9 energy price of 41.20/MWh . In July, market prices began to rise, resulting in the daily
 10 HLH market price (in \$CAD) being lower than the RS 1823 Tier 1 energy price of
 11 \$41.20/MWh on 15 days and higher on 16 days of the month.



1 In Year 2, the average weighted market price paid for RS 1892 energy by participant
 2 customers was CAD\$19.50/MWh⁸ plus a \$3.00/MWh wheeling rate for a total
 3 delivered energy price of CAD \$22.50/MWh before rate rider and taxes. This
 4 compares to the RS 1823 Tier 1 energy price of \$41.20/MWh, the RS 1823 Tier 2
 5 energy price of \$92.32/MWh and the RS 1823 Part A energy price of \$46.31/MWh
 6 (prices shown before rate rider and taxes).

7 Participating RS 1892 customers had advance knowledge of day-ahead market
 8 prices for both HLH and LLH and could choose to use energy under RS 1892 when
 9 day-ahead market prices were low relative to RS 1823 energy prices. As shown in
 10 Figure 4-5 below, during the 2017 Freshet Period, the average RS 1892 market
 11 energy price was approximately half of the RS 1823 Tier 1 energy price. Customers
 12 also realized demand savings in any Billing Period where actual metered demand
 13 was higher than the Reference Demand. Accordingly, it is BC Hydro's view that
 14 the Freshet Rate provided customers with a lower cost option for incremental
 15 electricity use.

16 **Q: How quickly did customers respond to changes in market prices?**

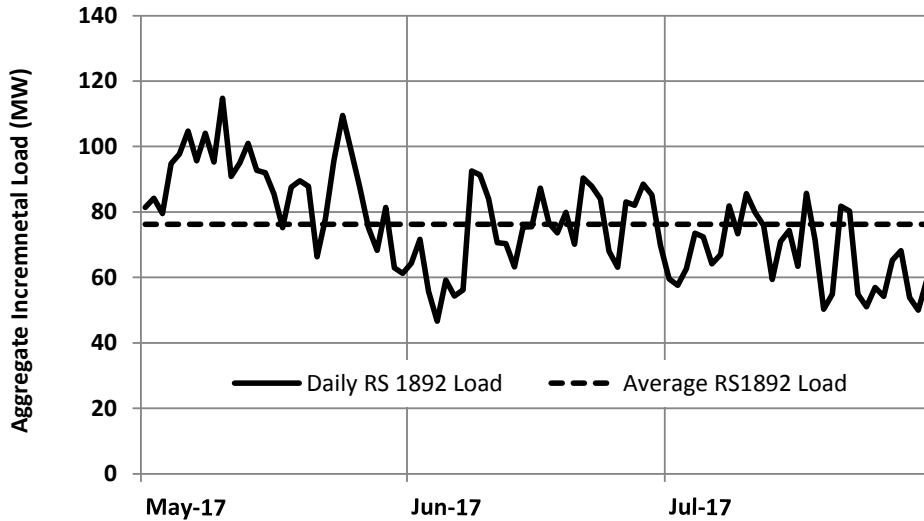
17 In general, customers appeared to operate their facilities to optimize electricity costs
 18 such that the aggregate load increase was typically highest when market prices were
 19 low and vice versa. For example, the highest aggregate load increase was observed
 20 in May 2017 when market prices were lowest and the lowest aggregate load increase
 21 was observed in July 2017 when market prices were highest. [Figure 4-4](#) and
 22 [Figure 4-5](#) below illustrate the aggregate customer response (load shape) to changes
 23 in market prices.

⁸ The actual price of RS 1892 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Freshet Energy.



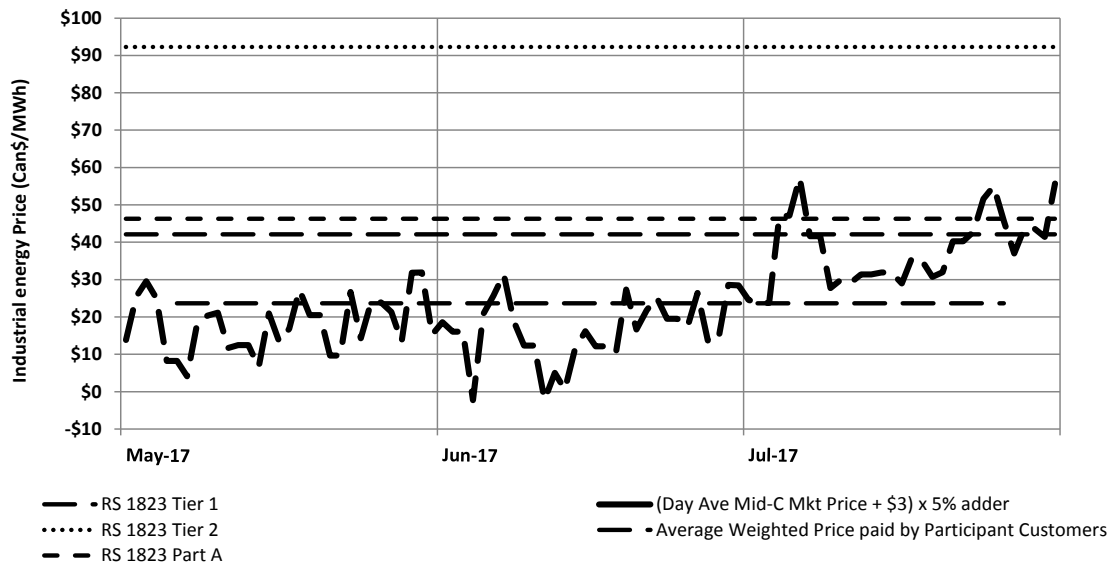
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Figure 4-4 Aggregate Incremental Load



2

Figure 4-5 Industrial Energy Prices



**Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16 Directive 3**

BC Hydro Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18
Transmission Service Market Reference
Priced Rates Application



1 In terms of the speed of customer response, some customers advised that they were
 2 closely monitoring daily market prices to make daily operating decisions. Refer to
 3 sample of customer survey responses below for context:

4 “The day-ahead market pricing formed the basis of freshet
 5 energy purchases above the HLH and LLH baselines. If the
 6 day-ahead prices exceeded the all-in RS 1823 Tier 1 price,
 7 purchases were reduced to the baselines.”

8 “Day-ahead market pricing was front and centre on our mill
 9 information system for key load consumption and power
 10 generation areas. The day-ahead price was compared to our
 11 internal cost to generate power and was also used in planning
 12 ahead for load consumption profiling. It set a price threshold
 13 above which it was not economic to increase loads or curtail
 14 internal power generation.”

15 Other customers advised that daily pricing did not influence their operating decisions
 16 either because they were unaware of the market price changes (i.e., they were not
 17 actively monitoring daily market prices) or had already made an advance commitment
 18 to higher operating levels and sales with the expectation of lower market prices. Refer
 19 to sample of customer survey responses below for context:

20 “The daily Mid-C pricing did not influence how we operated once
 21 the freshet period started. Even if the Mid-C price spiked, we
 22 would not change our process as we were already committed (to
 23 incremental sales).”

24 “We plan production prior to the start of each month ... so the
 25 day-ahead pricing information was only used to estimate the
 26 potential savings.”

27 In summary, this information suggests that some customers responded on a
 28 day-to-day basis, while others responded less quickly or not at all.

29 **Q: How did customers use the rate?**

30 Customers took various actions to increase load during the 2017 Freshet Period,
 31 including the following:



-
- 1 • Using idle production capacity (including higher utilization of operating plant,
 - 2 addition of production shifts and manufacture of more energy intensive product
 - 3 grades);
 - 4 • Installing new equipment and retrofit of existing equipment;
 - 5 • Maximizing production output by operating the plant without the prospective
 - 6 constraint of setting an HLH demand peak under RS 1823;
 - 7 • Rescheduling of maintenance shutdowns into non-Freshet months;
 - 8 • Turndown and/or curtailment of non-contracted self-generation; and
 - 9 • Generator curtailment due to forced or planned outages.

10 Refer to sample of customer survey responses below for additional context:

11 “We increased our whole log chipping during the Freshet Period,
12 which utilizes a large electric motor.”

13 “The specific action plan was to operate the plant at full
14 (maximum) rates, track energy and cost daily, and avoid
15 unscheduled downtime.”

16 “We monitored daily freshet and natural gas pricing and
17 increased production at the most opportune times. Additionally,
18 we reduced our internal power generation when the price signals
19 justified the generation curtailment.”

20 Our approach was to run at maximum production rates during the
21 entire Freshet Period. Time of day or week had no influence on
22 our strategy.”

23 “We tried to increase the consumption of harder to process fibre
24 material (bark) which is more energy intensive ... we also
25 invested in a new electric log chipper.”

26 “Equipment upgrades were planned to increase the operational
27 efficiency of the plant. We invested in new wiredraw machines
28 that consume more power and increase our production capacity.”



1 “The planned action was to look at our production and
 2 maintenance scheduling. We attempted to operate at full capacity
 3 and make higher specific energy grades during the Freshet
 4 Period.”

5 **4.3 Load Shifting**

6 **Q: To what extent did load shifting contribute to higher freshet energy?**

7 For Year 2, while some customers have provided preliminary information regarding
 8 load shifting, such as the re-scheduling of maintenance into non-Freshet Period and
 9 forced generator outages, it is not possible to verify the impact of all prospective
 10 events of load shifting until BC Hydro’s F2018 period has ended and the F2018 CBL
 11 annual review process is complete. BC Hydro will consult further with participant
 12 customers to identify and verify the prospective volumes of self-reported load shifting
 13 energy during Year 2. BC Hydro will also conduct its own analysis. This information
 14 will be included in BC Hydro’s final evaluation report. As directed by Commission
 15 Order No. G-17-16, BC Hydro provides an analysis of load shifting for Year 1 in this
 16 report. This analysis is provided in section [4.6.4](#).

17 **Q: Was there any shifting within the freshet period from HLH to LLH?**

18 BC Hydro asked customers to identify whether they made operational changes to
 19 shift load from HLH to LLH. Most customers advised that they did not have the
 20 process or operational ability to consider time-of-day scheduling. The general focus
 21 for customers was to secure orders for incremental product in advance and run their
 22 operation harder during the entire Freshet Period. One customer advised that it
 23 modified its operating hours with the intent to shift a portion of incremental production
 24 from HLH to LLH. The operational change was a minor adjustment by pushing back
 25 the afternoon shift start time. This had the effect of moving a small volume of
 26 production/operation from HLH into LLH. The estimated impact of this change is
 27 approximately 200 MWh, which BC Hydro does not consider to be material.



1 **Q: Did customers with aggregated RS 1823 loads shift consumption between**
2 **plants to take advantage of this rate?**

3 BC Hydro is not aware of any load that was shifted between plants for customers with
4 aggregated plants under RS 1823 for Year 2.

5 **4.4 Operational Considerations**

6 **Q: Did BC Hydro curtail any customers under the non-firm provisions of the**
7 **rate? If not, were there any financial impacts to BC Hydro from not curtailing**
8 **customers during constrained periods?**

9 No, BC Hydro did not curtail RS 1892 service to any customer during the
10 2017 Freshet Period. Sufficient energy and capacity were available at all times to
11 serve the incremental load. There were no negative financial impacts to BC Hydro
12 from not curtailing customers.

13 **Q: Was there any impact on RS 1880 events? Did customers use the rate as a**
14 **substitute for RS 1880?**

15 Yes, the RS 1892 option had an impact on RS 1880 usage. BC Hydro is aware that
16 four customers with self-generation facilities used service under RS 1892 as a
17 substitute for RS 1880 during the 2017 Freshet Period. The circumstances under
18 which the customers have used RS 1892 service as a substitute for RS 1880 service
19 include forced generator outage, planned generator outage and minor generation
20 fluctuations. Of these, BC Hydro considers events of forced generator outage to be
21 the most significant with respect to impacting RS 1880 since the customer would
22 have normally requested RS 1880 service for a number of days or weeks due to
23 generator outage, but for the availability of RS 1892. Events of generator fluctuation
24 are less significant because they typically reflect 'ad-hoc' requests for RS 1880
25 service of less than 16 hours to avoid setting a monthly billing demand peak under
26 RS 1823 and do not have a material energy component. Events of voluntary
27 self-generation curtailment are not relevant to this analysis because they reflect a direct



1 customer action to increase load under RS 1892 (the desired outcome) as opposed to
 2 an event of generator outage that would have occurred anyway (i.e., RS 1892 had no
 3 bearing on the outage).

4 From its Year 1 analysis, BC Hydro has determined that RS 1892 can provide a
 5 lower-cost option to RS 1880 for customers with a forced or planned outage of their
 6 self-generation facilities when Mid-C market prices are lower than prevailing RS 1880
 7 and RS 1823 prices. This is because both RS 1892 and RS 1880 provide for an
 8 identical interruptible service when a customer's self-generation facilities are
 9 curtailed, but with different pricing.

10 When self-generation is curtailed, any temporary increase in utility-served load that
 11 coincides with the Freshet Period results in the collection of less revenue under
 12 RS 1892 (where incremental energy is charged at daily market prices) than would
 13 otherwise be collected under RS 1880 (where incremental energy during HLH is
 14 charged at the RS 1823 Tier 2 rate and incremental energy during LLH is charged at
 15 the RS 1823 Tier 1 rate). There is no demand charge in either case.

16 BC Hydro considers that this revenue reduction would accordingly decrease the
 17 estimated non-participant and ratepayer benefit, but would still provide bill savings to
 18 participants that would otherwise have taken RS 1880 energy. In order to provide a
 19 more detailed analysis for Year 2, BC Hydro believes that it will need to consult
 20 further with its self-generating customers to identify the estimated volumes of
 21 incremental electricity purchased under RS 1892 that would likely have been
 22 purchased under RS 1880 if RS 1892 were not available. This information will be
 23 included in BC Hydro's final evaluation report.



1 **4.5 Financial Considerations**

2 **4.5.1 Wheeling Rate**

3 Direction 4b of Commission Order No. G-17-16 directed BC Hydro as part of its
 4 reporting to address and, where appropriate, evaluate the wheeling rate under
 5 RS 1892 as compared to FortisBC Inc.'s standby rate. BC Hydro's RS 1892 wheeling
 6 rate is \$3.00/MWh and FortisBC Inc.'s standby rate is \$4.00/MWh (as shown in
 7 Schedule 37 for Large Commercial Standby Service).⁹ The wheeling rate difference is
 8 \$1.00/MWh.

9 For Year 2, if the RS 1892 wheeling rate had been \$4.00/MWh, this would have
 10 provided an additional \$168,399 of wheeling revenue plus an additional \$8,420 of rate
 11 rider revenue. This analysis assumes the same total RS 1892 energy volume of
 12 168,399 MWh (i.e., that the higher wheeling rate would have had no impact on
 13 customer participation).

14 As provided in the 2015 RDA, BC Hydro continues to believe that the \$3.00 wheeling
 15 fee is still appropriate.

16 **4.5.2 Incremental Costs**

17 As of November 2017, BC Hydro has incurred approximately \$30,000 in incremental
 18 costs specific to Year 2 implementation of the Pilot. Refer to [Table 4-5](#) below. All
 19 other staff and administration costs were funded under existing operating budgets.

20 **Table 4-5 Freshet Rate Year 2 Incremental Cost**

	(\$)
1. RS 1823 customer engagement	15,000
2. Billing implementation	10,000
3. Year 2 Evaluation Report Preparation	5,000
Total Incremental Cost	30,000

⁹ Schedule 37 can be found in FortisBC Inc's Electric Tariff at
<https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/Documents/FortisBCElectricTariff.pdf>.



1 **4.6 Ratepayer Impacts**

2 **4.6.1 Determination of Year 2 Ratepayer Benefit**

3 **Q: Did the rate have positive or negative impacts on non-participating**
4 **customers?**

5 BC Hydro's preliminary view is that the Freshet Rate had a positive impact on both
6 participant and non-participant customers in Year 2. For all ratepayers, BC Hydro has
7 calculated a preliminary Year 2 benefit of approximately **\$2.2 million**. This preliminary
8 benefit remains subject to a number of critical assumptions that will be reviewed when
9 BC Hydro has a full year of F2018 data and has completed its F2018 CBL annual
10 review and Year 2 load shifting analysis. This information will be included in
11 BC Hydro's final evaluation report. The following describes the process and approach
12 that BC Hydro used to determine the preliminary Year 2 benefit. As further explained
13 below, BC Hydro has also re-estimated the Year 1 ratepayer impact using Year 2
14 methodology.

15 Year 2 Methodology

16 For Year 2, BC Hydro decided to use an updated methodology to determine
17 ratepayer impacts. Rather than using an assessment of seasonal system conditions,
18 BC Hydro focused on using an assessment of daily system conditions. Power supply
19 operations were examined to determine the marginal resource used to serve
20 incremental RS 1892 HLH and LLH energy volumes during each day of the
21 2017 Freshet Period. The marginal resource is either market (Mid-C) during HLH or
22 LLH or BC Hydro's large basin system generation on a daily basis, as explained
23 below.



1 **Condition 1: Minimum generation with forced export**

2 When BC Hydro is experiencing a minimum generation constraint,¹⁰ and net exports
3 are forced to avoid spill, incremental domestic sales under RS 1892 will reduce forced
4 exports. Holding market price constant, BC Hydro will see a revenue increase equal
5 to the difference between the CAD \$3/MWh wheeling fee and 5 per cent rate rider
6 collected under RS 1892 and the avoided US \$5.15/MWh wheeling converted to
7 Canadian dollars plus 1.9 per cent transmission losses charge for energy delivery
8 from the BC border to the Mid-C market.

9 **Condition 2: Minimum generation with economic import**

10 When BC Hydro is experiencing a minimum generation constraint, while importing on
11 an economic basis, incremental domestic sales under RS 1892 will increase market
12 imports. Holding market price constant, BC Hydro will see a revenue decrease equal
13 to the difference between the CAD \$3/MWh wheeling fee and 5 per cent rate rider
14 collected under RS 1892 and the US \$5.15/MWh wheeling and 1.9 per cent
15 transmission losses charge converted to Canadian dollars paid for energy delivery
16 from the Mid-C market to the BC border.

17 On days where the market price is negative, the revenue loss will be reduced by the
18 difference between the actual market price and the \$0/MWh floor price under
19 RS 1892 (considered as market floor price differential in the calculation above).

20 **Condition 3: Higher basin generation on the margin**

21 Holding import/export volumes constant, the loading of BC Hydro's large basin
22 generation will be increased to serve additional RS 1892 load. BC Hydro considers
23 that the cost consequence (revenue gain or loss) of this circumstance can be
24 estimated by comparing the actual revenue gained from RS 1892 energy sales with
25 the deemed value of the water/energy removed from the BC Hydro large basin to

¹⁰ Appendix D to the Year 1 evaluation report defines system minimum generation (page 5 of 20). Must-take energy is energy that cannot be stored at the generating facility for later use (e.g., at facilities with little or no storage). System minimum generation is if the system is operating exclusively on must-take energy.



1 serve the additional load rather than being held in storage. The value of the
2 incremental generation from the large basin that is operated to serve the load can be
3 expressed as a daily System Marginal Value.

4 For the 2017 Freshet Period, a daily System Marginal Value was determined for each
5 of BC Hydro's Kinbasket and Williston reservoirs in HLH and LLH:

- 6 • For Kinbasket reservoir, marginal values ranged from CAD \$6 to \$20/MWh; and
- 7 • For Williston reservoir, marginal values ranged from CAD \$9 to \$22/MWh.

8 For any day where basin energy was used to serve RS 1892 loads, the difference
9 between the value of actual RS 1892 energy sales and BC Hydro's System Marginal
10 Value was used to determine the revenue gain or loss on that day.

11 [Table 4-6](#) shows the estimated ratepayer impact by month for the three marginal
12 resource conditions in \$CAD for Year 2.

13 **Table 4-6 RS 1892 Monthly Ratepayer Impact by**
14 **Marginal Resource for Year 2**

Month	Marginal Resource		
	Market Export (\$000)	Market Import (\$000)	System Basin (\$000)
May	56	(93)	424
June	117	(55)	402
July	38	n/a	1,305

15 Estimated Year 2 Ratepayer Benefit

16 Using this approach, BC Hydro determined a preliminary ratepayer benefit of
17 approximately \$2.2 million for RS 1892 energy sales in Year 2. Importantly, this
18 estimate assumes that all RS 1892 energy volumes reflect load that is 'truly
19 incremental' (i.e., the 2017 Freshet Period incremental load would not have occurred
20 in the absence of the new rate and no incremental market import/export opportunity
21 was available in any given hour during the 2017 Freshet Period). BC Hydro cautions



1 that these critical assumptions have not yet been verified for Year 2, but will be in the
2 final evaluation report.

3 Appropriateness of Sharing Benefits with Non participant Customers

4 BC Hydro's rate design principle is that non participants should be held harmless by
5 the freshet rate. The preliminary results of this Year 2 evaluation indicate a positive
6 benefit that accrues to all BC Hydro ratepayers.

7 **4.6.2 Revised Year 1 Ratepayer Benefit using Year 2 Methodology**

8 The preliminary evaluation report for Year 1 estimated a ratepayer benefit of
9 \$2.0 million. In that report, BC Hydro used an assessment of seasonal system
10 conditions and assumed incremental RS 1892 energy volumes to have primarily
11 translated into a change in its large basin operations over the entire 2016 Freshet
12 Period. This assumption meant that BC Hydro applied Condition 3 as described
13 above to incremental RS 1892 energy volumes across the entire 2016 Freshet
14 Period. BC Hydro considers that the daily assessment of system conditions analysis
15 methodology used for Year 2 provides a more accurate assessment of value and
16 ratepayer impact. Accordingly, BC Hydro has updated its analysis for Year 1 using
17 the Year 2 methodology. The revised analysis for Year 1 results in a \$2.3 million
18 benefit, which is an increase in \$.3 million from the previous estimate.

19 [Table 4-6](#) shows the estimated ratepayer impact by month for the three marginal
20 resource conditions in \$CAD for Year 1.

21 **Table 4-7 RS 1892 Monthly Ratepayer Impact by**
22 **Marginal Resource for Year 1**

Month	Marginal Resource		
	Market Export (\$000)	Market Import (\$)	System Basin (\$)
May	61	(6)	481
June	0	0	806
July	0	0	917



1 **4.6.3 Review of Load Shifting Analysis Criteria**

2 Pursuant to Direction 4(g) of Commission Order No. G-17-16, BC Hydro was directed
3 to analyze the impact of any load shifting, including with regard to the actual monthly
4 consumption for each pilot participant in comparison to the respective CBLs for each.

5 BC Hydro recognizes that “load shifting” was a key concern raised by interveners and
6 Commission staff during the 2015 RDA regulatory process. BC Hydro’s position was
7 that load shifting is a complex issue and there may be risks; however, load shifting
8 should be eligible for the Freshet Rate as long as there is incremental consumption
9 during the Freshet Period.

10 Load shifting occurs when a customer changes the timing of electricity consumption
11 by buying more energy during the Freshet Period and less in other months during the
12 year. If this occurs, and assuming no net change in total annual energy consumption,
13 the customer would be charged less for electricity on a yearly basis where energy
14 charges under Rate Schedule 1892 are lower than BC Hydro’s electricity charges
15 under RS 1823 (and RS 1880, where applicable). All else being equal, this could
16 create a cost-shifting risk for non-participants.

17 Accordingly, BC Hydro sought to identify any circumstance whereby a participant
18 customer might have shifted load from non-Freshet months into the 2016 Freshet
19 Period during F2017. BC Hydro notes that Direction 4(g) asks for consideration of
20 load shifting, having regard to monthly consumption relative to CBL. For the two main
21 reasons below, BC Hydro does not believe that an analysis of monthly energy
22 consumption relative to the annual energy CBL under RS 1823 or the hourly energy
23 baseline under RS 1892 would provide meaningful information regarding whether a
24 volume of RS 1823 non-freshet energy was shifted into the Freshet Period.



1 **Participant customers served under RS 1823 Energy Charge A**

2 Some participant customers take service under RS 1823 Energy Charge Part A
 3 (**RS 1823A**). This is a flat rate for energy and the customer does not have an Energy
 4 CBL under RS 1823. Accordingly, no monthly (or annual) comparison relative to CBL
 5 can be made.

6 **RS 1823 Energy CBL and RS 1892 HLH and LLH baselines**

7 RS 1823 energy purchases are compared to the customer's annual Energy CBL to
 8 determine the mix of annual Tier 1 and Tier 2 energy.

9 However, there are no monthly RS 1823 energy CBLs that BC Hydro can use for the
 10 purposes of the load-shifting analysis, since the RS 1823 Energy CBL is a single
 11 annual number. Further, the Energy CBL is subject to adjustment as part of the CBL
 12 annual review process. Accordingly a comparison of monthly RS1823 energy
 13 consumption relative to the annual CBL is not relevant for the purpose of identifying a
 14 prospective load shift.

15 Gross RS 1892 energy purchases are determined hourly using an approved HLH
 16 baseline and LLH baseline. Gross RS 1892 energy for each of HLH and LLH is then
 17 adjusted at the end of the Freshet Period for the ratio of hourly energy consumption
 18 above and below the energy baseline (called the Net-Gross ratio). This ratio
 19 adjustment is designed to ensure a net increase of energy consumption relative to
 20 RS 1892 energy baselines is achieved over the entire freshet period.

21 A comparison of monthly RS 1892 energy consumption relative to these hourly
 22 baselines is not relevant for RS 1892 billing purposes or for the purpose of identifying
 23 a prospective load shift because freshet energy reconciliation and billing is completed
 24 in August (i.e., for the entire Freshet Period) not monthly.

25 BC Hydro has used annual energy consumption relative to CBL to perform the load
 26 shifting analysis as described in the following section.



1 **4.6.4 Analysis of Year 1 Load Shifting**

2 To perform the load shifting analysis, BC Hydro required a complete set of adjusted
 3 F2017 energy and CBL data (which includes the 2016 Freshet Period) for comparison
 4 to adjusted F2016 energy and CBL data (which includes the 2015 Freshet Period
 5 used to determine electricity baselines). Accordingly, BC Hydro needed to first
 6 complete its F2017 CBL annual review for each participant customer. More
 7 specifically, the CBL review process provides comprehensive information related to
 8 events that have been reviewed and verified to increase or decrease energy
 9 consumption during the fiscal year. This information is critical to support any
 10 meaningful analysis of load shifting from non-freshet months into the Freshet Period.

11 Additionally, BC Hydro requires knowledge of customer actions during the Freshet
 12 Period for the load shifting analysis.

13 BC Hydro's approach to the load shifting analysis is described in the steps below.

14 **Step 1: Survey all RS 1892 customer participants to identify specific actions**
 15 **taken to increase load during the 2016 Freshet Period:**

- 16 • Identify customers that have self-identified a load shifting event, such as moving
 17 a regular plant maintenance shutdown to a period outside the Freshet Period;
 18 and
- 19 • Identify customers with self-generation outages (forced or planned), where the load
 20 increase would be expected to occur in the absence of the freshet rate.

21 **Step 2: Prepare a data set for the 26 participant customers with actual RS 1892**
 22 **energy sales in Year 1, which includes:**

23 **Baseline data**

- 24 • Final F2016 Energy CBL;
- 25 • Actual F2016 RS 1823 energy consumption (including by month); and
- 26 • RS 1892 energy baselines and Reference Demand.



1 **Year 1 Data**

- 2 • Actual Year 1 RS 1892 energy sales in HLH and LLH;
- 3 • Actual F2017 RS 1823 energy consumption (including by month); and
- 4 • Final F2017 Energy CBL.

5 **Step 3: Compare each customer's F2017 annual energy sales with F2016 annual**
 6 **energy sales under RS 1823 by:¹¹**

- 7 • Identifying customers that purchased less RS 1823 energy during F2017
 8 compared to F2016. The intent of this comparison was to identify any potential
 9 relationship between a reduction in RS 1823 energy sales and a corresponding
 10 increase in RS 1892 energy sales, such that there was no net annual load
 11 increase.
- 12 • Identifying customers that purchased more RS 1823 energy during F2017
 13 compared to F2016. The intent of this comparison was to assess whether there
 14 was any relationship between an increase in both RS 1823 energy sales and
 15 RS 1892 energy sales, such that the load increase might reasonably be
 16 expected to have occurred anyway.

17 **Step 4: For the customers with lower RS 1823 energy sales in F2017:**

- 18 • Following Step 3 described above, BC Hydro identified 10 participant customers
 19 who had lower RS 1823 energy sales in F2017.
- 20 • BC Hydro reviewed the Final CBL Statements and supporting documentation for
 21 each customer to identify events that were verified to impact energy
 22 consumption, including:
- 23 ▶ BC Hydro load curtailment
- 24 ▶ Demand side management projects

¹¹ BC Hydro used annual energy sales for the comparison since monthly energy consumption is too granular and subject to customer-specific variances which is not suitable for this type of analysis.



-
- 1 ▶ Changes in self-generation output (contracted and non-contracted)
 - 2 ▶ Generation outages
 - 3 ▶ Force majeure events / unusual downtime
 - 4 ▶ Plant/equipment shutdowns
 - 5 ▶ Production and/or operating changes
 - 6 • For each of the ten customers, BC Hydro was able to identify the primary drivers
 - 7 of the RS 1823 energy sales variance. BC Hydro was not able to discern any
 - 8 “unexplained load variance” that might be considered to reflect a load shift from
 - 9 the RS 1823 non-freshet months to the 2016 Freshet Period.

10 **Step 5: For the customers with higher RS 1823 energy sales in F2017:**

11 BC Hydro reviewed the Final CBL Statements and supporting documentation for each

12 customer as described above.

- 13 • Following Step 4 above, BC Hydro identified 16 participant customers that had
- 14 higher RS 1823 energy sales in F2017.
- 15 • BC Hydro identified one customer circumstance of forced generator outage,
- 16 whereby the 2016 Freshet Period load increase was specific to the shutdown of
- 17 the customer’s self-generation. In the absence of RS 1892, BC Hydro considers
- 18 that this incremental electricity would have been purchased under RS 1823
- 19 and/or RS 1880. Actual RS 1892 revenue was compared to the revenue that
- 20 would have been collected. The revenue difference is (\$233,000).
- 21 • In one customer circumstance of self-reported load shifting (i.e., where the
- 22 customer self-reported load- shifting under Step 1 above by advising that a
- 23 regular plant shutdown was re-scheduled from June to September 2016),
- 24 BC Hydro obtained and verified details related to the customer’s plant shutdowns
- 25 in both September 2016 and June 2015, noting that the June shutdown was
- 26 incorporated into the customer’s RS 1892 energy baselines. BC Hydro



1 re-calculated the RS 1892 revenue and RS 1823 revenue that would have been
 2 collected had the September 2016 shutdown taken place in June 2016 as
 3 originally planned. The revenue difference is (\$32,000).

- 4 • At this time, BC Hydro is unable to determine with certainty whether other
 5 increases in customer load during the 2016 Freshet Period reflect permanent
 6 changes made to their plant or operations that would, or might reasonably be
 7 expected, to have occurred in the absence of the Freshet Rate (this has been
 8 referred to in the 2015 RDA Streamlined Review Process as “natural load
 9 increase”).

10 **Step 6: Revise the preliminary estimate of Year 1 benefit:**

11 In the Year 1 evaluation report, the preliminary estimate of positive ratepayer impact
 12 was initially calculated as \$2.0 million (old methodology) and subsequently revised to
 13 \$2.3 million (new methodology). This estimate assumed that all RS 1892 energy
 14 volumes reflect load that is truly incremental.

15 BC Hydro considers that the revised \$2.3 million estimate should be reduced by
 16 \$0.27 (\$233,000 plus \$32,000) million to \$2.03 million to reflect the results of the load
 17 shifting analysis described above. BC Hydro’s conclusion is that, for Year 1, except
 18 for the specific customer circumstances noted, there is no evidence that load has
 19 been shifted by participant customers from the non-Freshet Period to the Freshet
 20 Period.

21 **Load Shifting and Natural Load Growth Considerations for the Final Evaluation** 22 **Report**

23 As part of its final evaluation report, BC Hydro will examine load shifting and natural
 24 load growth in greater detail to determine whether they pose a significant risk of
 25 reducing the ratepayer benefits should the Freshet rate be offered on an on-going



1 basis.¹² The final evaluation report will also include an assessment of the uncertainty
 2 associated with load shifting and natural load growth, and a comparison of the
 3 magnitude of the uncertainty with the extent of potential benefits and risks to non-
 4 participants.

5 **4.7 Customer Feedback**

6 In September 2017, BC Hydro requested written feedback (via email) from all Year 2
 7 participant customers regarding their experience in participating in the Freshet Rate.
 8 As a general guide, BC Hydro provided customers with twelve questions across
 9 three categories: (1) Actions Taken; (2) Results Achieved; and (3) In Review/Next
 10 Steps. Refer to [Appendix B](#) for a copy of the feedback questions. Customers were
 11 asked to provide their written comments to BC Hydro by September 29, 2017. All
 12 44 participant customers responded. Their feedback is summarized below and has
 13 also been incorporated into various sections of this report.

14 **4.7.1 Customer Feedback Regarding Year 2**

15 In general, customers indicated that:

- 16 • The sign-up process was both straightforward and low risk, given the ability to
 17 'opt out' of the rate any time prior to July 31, 2017;
- 18 • The baseline determination process was clear and the baselines established
 19 were fair; and
- 20 • They were satisfied with the rate schedule and viewed it as an opportunity to
 21 produce additional volumes of product(s) at lower cost.

¹² At the 2015 RDA Freshet Rate Streamlined Review Process (SRP), BC Hydro committed to look at whether natural increase in load was a risk in terms of 1823 customers (SRP Transcript page 275 (lines 17 to 26) to page 276 (lines 1 to 10)).



1 **4.7.2 Customer Feedback Regarding Extension of Freshet Pilot for Year 3**
 2 **and Other Recommendations**

3 Customers have indicated that they would participate in Year 3 if the Freshet Rate
 4 pilot is extended for a third year and they would consider additional actions to use
 5 incremental electricity. Accompanying this report, BC Hydro has requested that the
 6 termination date of the Pilot be extended from December 31, 2017 to
 7 December 31, 2018.

8 BC Hydro notes that a number of customers continued to indicate their reluctance to
 9 make capital investments and/or permanent operating changes to use incremental
 10 electricity in the absence of an assurance that the Freshet Rate would extend beyond
 11 the Pilot period as an on-going rate. Customers also made the following suggestions
 12 and recommendations:

- 13 • Shift the Freshet Period to run from April to June;
- 14 • Extend the Freshet Period by one month (i.e., to run from April to July);
- 15 • Expand the program to align with market-based opportunity for incremental
 16 production over 12 full months;
- 17 • Change the end of period Net-to-Gross Ratio settlement to a monthly settlement
 18 period (i.e., freshet energy reconciliation should be performed on a monthly
 19 basis, rather than seasonally);
- 20 • Increase the market floor price from \$0/MWh to \$10/MWh;
- 21 • Cap the Mid-C price to Tier 1 rates or current blended rate (RS 1823A)
 22 applicable to the customer's facility; and
- 23 • Add a mechanism to adjust for non-recurring events (such as equipment failures)
 24 that are outside of a customer's control and reduce load during the Freshet
 25 Period and eliminate the benefits of actions previously taken.



1 **4.7.3 Customer Feedback Regarding Rate Administration**

2 A number of customers recommended that BC Hydro provide a monthly progress
3 report on estimated RS 1892 energy volumes and pricing for accrual purposes.
4 Customers have also requested that BC Hydro provide better tools and resources to
5 help them track their participation in Freshet Rate and to support operations, planning
6 and reporting requirements.



**Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16
Directive 3**

Attachment 3

Appendix A

**Freshet Baseline Application (April 26, 2017)
Public Version**



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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Mr. Patrick Wruck
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



April 26, 2017
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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.



April 26, 2017
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Commission Secretary and Manager
Regulatory Support
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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,

A handwritten signature in black ink, appearing to read "Fred James", written in a cursive style.

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

Appendix D
Freshet Rate Pilot Final Evaluation Report
Attachment 2
Attachment 3
Preliminary Evaluation Report for Year 2
Appendix A
Appendix A



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Vancouver, BC Canada V6Z 2N3
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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 -
Transmission Service Freshet Energy Baselines Application (2017)

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Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16 Directive 3
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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

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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

Rate Schedule 1892 -
Transmission Service Freshet Energy Baselines Application (2017)
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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**

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"> 1. The greater of <ol style="list-style-type: none"> (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 2. 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"> 1. Freshet Period May 1 to July 31 inclusive.

ACCEPTED: April 13, 2017

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 COMMISSION SECRETARY

BC Hydro

Rate Schedule 1892 – Revision 1
Effective: May 1, 2017
Page 5-26

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>
<p>Reference Demand for Rate Schedule 1823</p>	<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: April 13, 2017

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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 and 2017 only.

ACCEPTED: April 13, 2017

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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, 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>
--	---

ACCEPTED: April 13, 2017

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BC Hydro

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- | | |
|--|--|
| | <p>5. Electricity under this Rate Schedule will not be available to a Customer if:</p> <ul style="list-style-type: none">(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. <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

ORDER NO. G-54-17


COMMISSION SECRETARY

Rate Schedule 1892 -
Transmission Service Freshet Energy Baselines Application (2017)

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BC Hydro
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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

ORDER NO. G-54-17


 COMMISSION SECRETARY



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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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

Transmission Service Freshet Rate Compliance with Commission Order No. G-17-16 Directive 3	Page 25 of 26
BC Hydro Transmission Service Freshet Rate Pilot Compliance with Commission Order Nos. G-17-16 and G-45-18	Page 88 of 92
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CONFIDENTIAL APPENDIX

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**Transmission Service Freshet Rate
Compliance with Commission Order No. G-17-16
Directive 3**

Attachment 3

Appendix B

Customer Feedback Questions

Dear xxx,

Thank you for participating in Year 2 of BC Hydro's Freshet Rate Pilot. A high-level summary of results for the period 01 May – 31 July 2017 is provided below. Your participation helped to make Year 2 a success!

- 44 unique customer participants
- 168 GWh of incremental energy sales (consolidated)
- 76 MW.hr of average incremental load for the Freshet Period (consolidated)
- Average unit cost of market-priced energy: **CAD \$19.50/MWh**
- Average "all-in" unit cost of RS 1892 energy: **CAD \$ 23.63/MWh** (*includes \$3/MWh wheeling charge + 5% rate rider, excludes taxes*)

Year 2 Evaluation Report

You may recall that the Freshet Rate was approved by the BC Utilities Commission on a 2yr pilot basis. As part of that approval, BC Hydro was directed to submit a Year 2 Evaluation Report¹ by Fall 2017. Among other things, the Report needs to describe what customers did to take advantage of the Rate. So I'm writing to ask for your help in telling the customer side of the story...

Please consider the questions below and provide your confidential response back to me by letter or email by Friday 29 September.

Note that these questions are only a guide. Please feel free to include any additional information that you think would be helpful. Call your Key Account Manager if you have any questions. Sincere thanks!

Actions Taken

- What specific actions did you take in your facility to increase electricity use during the Freshet Period? **Please tell us about your experience ...**
- Did you have a specific action plan? Did your plan change? Did you leave anything on the table?
- How did you communicate details of the Rate to your operational staff?
- How did you use the day-ahead market pricing information provided by BC Hydro to shape your actions? Was there a price threshold above which it was not economic for you to increase load?
- Did you focus on differentials between HLH or LLH periods or was the focus more on certain days, certain months or the entire Freshet Period?
- Did you make any investments in equipment, technology, or resources to take advantage of the Rate?

Results Achieved

- What specific results did you achieve? Consider operational, financial, production, resourcing impacts ... Did you increase production? Did you increase sales? What was the overall value to your business?
- Did you set specific targets? Did you achieve them? How did you track/measure your performance? What tools, metrics, feedback loops etc. did you use to assess how you were tracking against your target objectives?

¹ See attached Commission Order (G-17-16) for details

In Review / Next Steps*

- What are your over-arching views on your Year 2 Freshet Rate experience? Was it beneficial? Why or why not?
- The 2yr Freshet rate pilot has now expired. Would you support an application to extend the Freshet rate pilot for a 3rd year (i.e., for May-July 2018)?
- Would you participate in Year 3 of the pilot if an extension was approved? If so, is there anything that you would seek to do differently / do better next year?
- Do you have any suggestions for BC Hydro on how any aspect of the rate could be improved?
- If the Freshet Rate were to be made permanent, would you consider making capital investments and or permanent operating changes to use incremental electricity? What might you do?

** Customer feedback regarding the possible extension of the Freshet Rate pilot for a 3rd year will be included in the Year 2 Report to the Commission.*



**Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-17-16 and G-45-18**

Freshet Rate Pilot Final Evaluation Report

Attachment 3

**Customer Survey Questions and
Customer Feedback Form**

Dear xxx,

Thank you for participating in Year 3 of BC Hydro's Freshet Rate Pilot. A high-level summary of results for the period 01 May – 31 July 2018 is provided below. Your participation helped to make Year 3 a success!

- 45 unique customer participants
- 150 GWh of incremental energy sales (consolidated)
- 68.1 MW.hr of average incremental load for the Freshet Period (consolidated)
- Average unit cost of market-priced energy: **CAD \$23.31/MWh**
- Average "all-in" unit cost of RS 1892 energy: **CAD \$ 27.63/MWh** (*includes \$3/MWh wheeling charge + 5% rate rider, excludes taxes*)

Year 3 Evaluation Report

You may recall that the Freshet Rate was initially approved by the BC Utilities Commission on a 2yr pilot basis, On 8th December, 2017 BC Hydro applied to extend the Freshet Rate Pilot for a third year. The Commission approved BC Hydro's request. As part of that approval, BC Hydro was directed to submit a Final Freshet Rate Pilot Evaluation Report^[1] by Fall 2018. Among other things, the Report needs to describe what customers did to take advantage of the Rate. So I'm writing to ask for your help in telling the customer side of the story...

Please consider the questions below and provide your confidential response back to me by letter or email by Thursday 27 September.

Note that these questions are only a guide. Please feel free to include any additional information that you think would be helpful. Call your Key Account Manager if you have any questions. Sincere thanks!

Actions Taken

- What specific actions did you take in your facility to increase electricity use during the Freshet Period? **Please tell us about your experience ...**
- Did you have a specific action plan? Did your plan change? Did you leave anything on the table?
- How did you communicate details of the Rate to your operational staff?
- How did you use the day-ahead market pricing information provided by BC Hydro to shape your actions? Was there a price threshold above which it was not economic for you to increase load?
- Did you focus on differentials between HLH or LLH periods or was the focus more on certain days, certain months or the entire Freshet Period?
- Did you make any investments in equipment, technology, or resources to take advantage of the Rate?

Results Achieved

- What specific results did you achieve? Consider operational, financial, production, resourcing impacts ... Did you increase production? Did you increase sales? What was the overall value to your business?
- Did you set specific targets? Did you achieve them? How did you track/measure your performance? What tools, metrics, feedback loops etc. did you use to assess how you were tracking against your target objectives?

^[1] See attached Commission Order G-45-18 for details



Feedback Form: October 11, 2018 Transmission Service Rates Workshops

My Name: _____

Title: _____

Company: _____

Representing (if different from Company): _____

Feedback Form: October 11, 2018 Transmission Service Rates Workshops

B. Freshet Rate	YES	NO	UNSURE	Additional Comments
1. Do you think BC Hydro should continue to offer Freshet Rate service? Why or why not? Please comment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. If yes to continuing Freshet Rate service, do you think BC Hydro should apply to have the Freshet Rate: (a) made permanent?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Or (b) extended for a further 3 year pilot period?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Do you support a status quo approach to keep the Freshet Period as May-July?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Do you support a status quo approach to retain the \$0/MWh market price floor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Do you think the 'wheeling rate' should: (a) remain at \$3/MWh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Or (b) be re-priced higher or lower?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Do you think that Freshet Rate (RS 1892) energy determination and billing should be reconciled on (a) a seasonal basis (status quo)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Or (b) Or on a monthly basis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Feedback Form: October 11, 2018 Transmission Service Rates Workshops

7. Do you think that Freshet Rate (RS 1892) energy baselines should have (a) 'automatic' adjustment provisions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Or (b) remain subject to BC Hydro and Commission approval for any changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. For new RS 1823 customers, do you agree that a minimum of 2 prior years of Freshet Period consumption history should be required for Freshet Rate (RS 1892) baseline determination?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Do you agree that Freshet Rate (RS 1892) baselines should transfer with the site if there is a change in site ownership?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10. Do you agree that only one site owner is eligible to be billed under the Freshet Rate (RS 1892) during any Freshet Billing Period? (i.e., no pro-ration of reconciled energy sales)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Additional Comments / Feedback:

Feedback Form: October 11, 2018 Transmission Service Rates Workshops

CONSENT TO USE PERSONAL INFORMATION

I consent to the use of my personal information by BC Hydro as provided in this feedback form. Personal information includes my comments and contact details. This information is collected and protected by BC Hydro in accordance with the ***Freedom of Information and Protection of Privacy Act***. Personal information is not considered, in any way, to reflect the express or implied views of the company you represent. Comments submitted will be used to inform BC Hydro's customer service and rate design efforts for transmission service rate customers.

Signature: _____

Date: _____

Thank you for your feedback!

Please return completed feedback forms via email to:

BC Hydro, Regulatory Group (BCHydroRegulatoryGroup@bchydro.com)



Feedback Form: November 19, 2018 Transmission Service Rates Workshop

My Name: _____

Title: _____

Company: _____

Representing (if different from Company): _____

A. Market Reference-Priced Rates

	YES	NO	UNSURE	ADDITIONAL COMMENTS
1. Do you support BC Hydro making an application to file the Freshet Rate and Incremental Energy Rate together, each for a 3 year pilot term? Why or why not?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Feedback Form: November 19, 2018 Transmission Service Rates Workshop

Additional Comments / Feedback:

CONSENT TO USE PERSONAL INFORMATION

I consent to the use of my personal information by BC Hydro as provided in this feedback form. Personal information includes my comments and contact details. This information is collected and protected by BC Hydro in accordance with the **Freedom of Information and Protection of Privacy Act**. Personal information is not considered, in any way, to reflect the express or implied views of the company you represent. Comments submitted will be used to inform BC Hydro’s customer service and rate design efforts for transmission service rate customers.

Signature: _____

Date: _____

Thank you for your feedback!

Please return completed feedback forms via email to:
BC Hydro, Regulatory Group (BCHydroRegulatoryGroup@bchydro.com)

**Transmission Service Market Reference
Priced Rates Application**

Appendix E

Freshet Rate Evaluation Report for Year 2019



Fred James

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

bchydroregulatorygroup@bchydro.com

October 31, 2019

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

Dear Mr. Wruck:

**RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Freshet Rate Pilot – Evaluation Report for Year 4**

BC Hydro writes pursuant to Commission Order Nos. G-106-19 and G-224-19 to enclose its Evaluation Report for Year 4.

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 in a cursive style.

Fred James
Chief Regulatory Officer

ac/af

Transmission Service Freshet Rate Pilot
Compliance with
Commission Order Nos. G-106-19 and G-224-19

Evaluation Report for Year Four

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Transmission Service Freshet Rate Pilot
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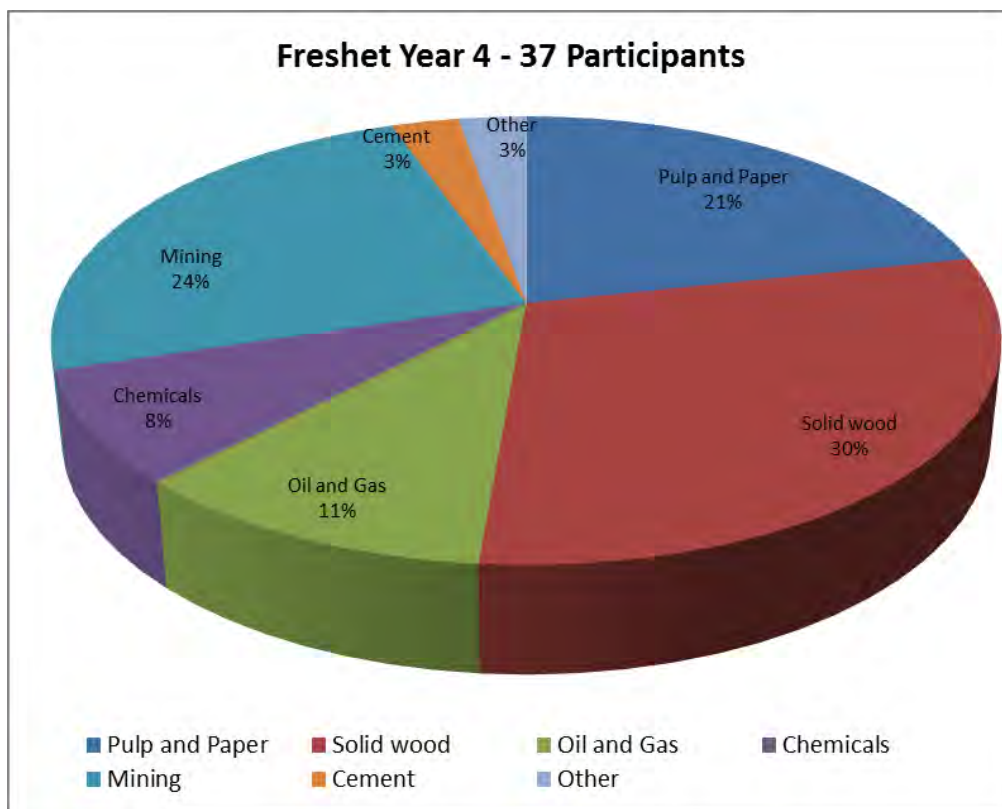
1 Year 4 Results

1.1 Customer Participation

Thirty eight unique transmission customer sites from across the province participated in Year 4 of the Pilot. One customer subsequently opted out of Year 4, reducing the total number of participant sites to 37. This reflects a decrease from 47 participating sites in Year 3. Ten sites which had participated in prior years did not participate in Year 4. There were no new customer participants.

Overall, this level of participation reflects approximately 25 per cent of eligible sites from the entire RS 1823 customer class. Customer participants represent a broad cross-section of industry sectors as shown in [Figure 1](#) below.

Figure 1 Customer Participation by Industry Sector (Year 4)



1 BC Hydro considers that customer participation for Year 4 was successful. Similar to
2 the feedback provided for Year 3, customer feedback for Year 4 indicated that the
3 sign up process for the Pilot was straight forward and that the 'opt out' provision of
4 the rate (i.e., ability to cancel supply at any time prior to July 31 in accordance with
5 Special Condition 6 of RS 1892) helped to de-risk their participation.

6 However, BC Hydro does consider that Year 4 participation was impacted, in part,
7 by the delay in seeking BCUC approval for the Year 4 extension. Subsequent to the
8 BCUC's interim approval on 15 April 2019, there was limited time for customers to
9 plan for their participation effective May 1st, 2019.

10 **1.2 Baseline Review and Adjustment**

11 Each of the 37 participant customer sites had electricity baselines (i.e., HLH
12 Baseline, LLH Baseline and Reference Demand) determined in accordance with
13 RS 1892. The purpose of the customer specific electricity baselines is to separate
14 incremental RS 1892 electricity purchases from RS 1823 electricity purchases
15 during the 2019 Freshet Period. For Year 4, no customer sites had baselines that
16 required adjustment pursuant to Special Condition 4 of RS 1892.

17 **1.3 RS 1892 Energy Sales and Revenue**

18 Of the 37 unique customer sites that participated in the 2019 Freshet Rate, only
19 20 of these sites purchased RS 1892 energy. The remaining 17 sites purchased less
20 energy than their RS 1892 energy baselines over the entire 2019 Freshet Period -
21 thus, all of the energy taken by these 17 customers was supplied under RS 1823.
22 For the 20 sites that purchased RS 1892 energy during the 2019 Freshet Period,
23 total RS 1892 energy sales and gross revenue are summarized in [Table 1](#) below.

1 **Table 1 RS 1892 Energy Sales and Gross**
2 **Revenue**

Total RS 1892 Energy Volume	111,468 MWh
Average Incremental Load	50.5 MW ave.hr (for total of 2,208 hrs)
Total RS 1892 Energy Sales	\$2.7 million ¹
Total Wheeling Rate Charges	111,468 MWh x \$3.00/MWh = \$0.3 million
RS 1892 Gross Revenue ²	\$3.04 million (excluding taxes)

3 [Table 2](#) below provides a comparison of the RS 1892 energy sales and gross
4 revenue for each of Year 1 (2016), Year 2 (2017), Year 3 (2018) and Year 4 (2019).

5 **Table 2 Comparison of RS 1892 Energy Sales and**
6 **Gross Revenue Year 1, Year 2, Year 3 and**
7 **Year 4**

	Year 1 (2016)	Year 2 (2017)	Year 3 (2018)	Year 4 (2019)
Number of Participant Sites	39	44	45	37
RS 1892 energy sales (MWh)	139,064	168,399	150,383	111,468
Average incremental load ³ (MW/hr)	63.0	76.3	68.1	50.5
Average unit cost of market-priced energy ⁴ (\$/MWh)	\$21.88	\$19.50	\$23.81	\$24.27
RS 1892 energy revenue (\$ million)	3.0	3.3	3.6	2.7
Plus \$3/MWh wheeling rate x energy volume (\$ million)	0.4	0.5	0.4	0.3
Plus 5 per cent deferral account rate rider (\$ million)	0.2	0.2	0.2	0
Total RS 1892 gross revenue (\$ million)	3.6	4.0	4.2	3.0
Average total unit cost of market-priced energy including wheeling rate and rate rider, excluding taxes ⁵ (\$/MWh)	26.12	23.63	28.15	27.27

8 In Year 4, total RS 1892 energy sales were 111,468 MWh and total RS 1892 gross
9 revenue was \$3.0 million. Compared to Year 3, the volume of RS 1892 energy sales

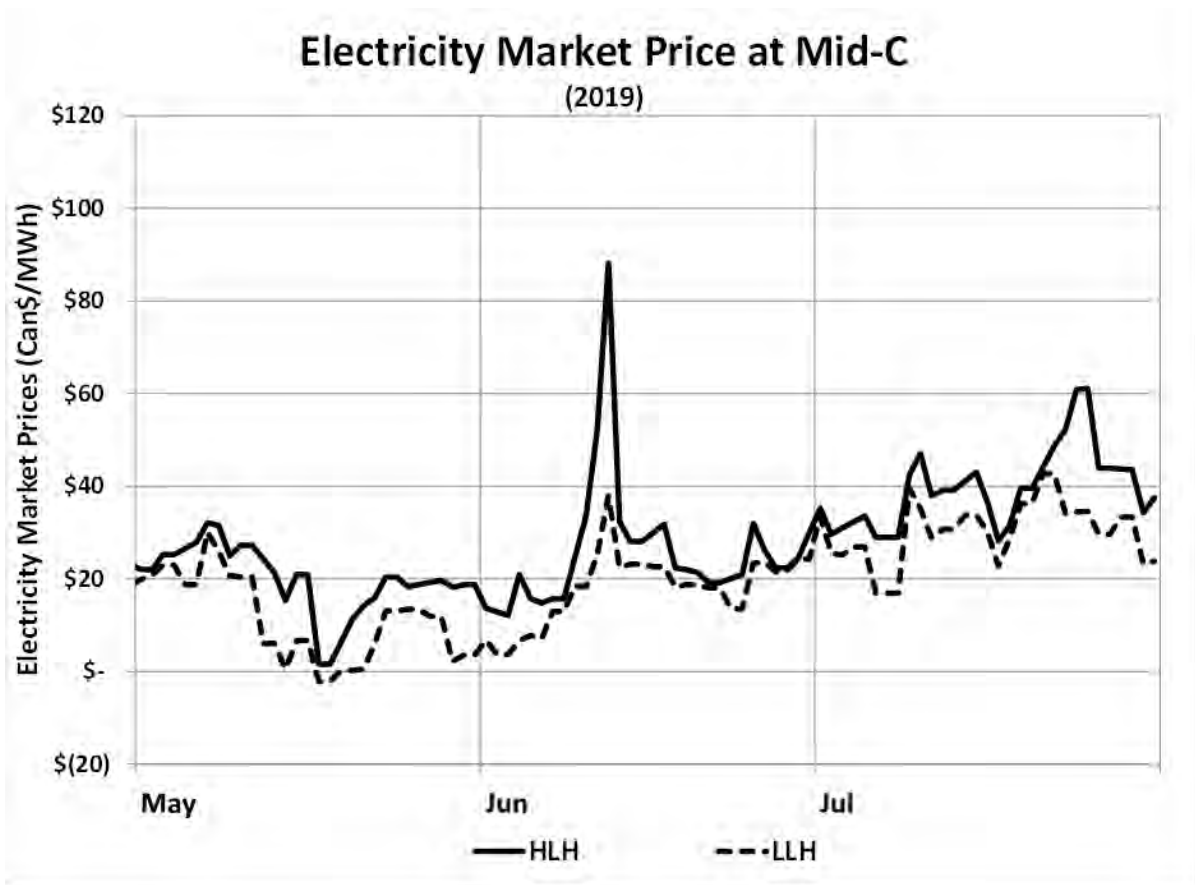
¹ Reflects an average Mid-C market energy price of CAD \$24.27/MWh, excluding wheeling rate.
² No deferral account rate rider was applicable to RS 1892 energy sales in the 2019 Freshet Period.
³ Total net RS1892 energy volume divided by 2208 freshet period hours.
⁴ RS 1892 energy revenue (excluding wheeling and rate rider) divided by RS 1892 energy sales volume.
⁵ RS 1892 energy revenue (after wheeling and rate rider) divided by RS 1892 energy sales volume.

1 in Year 4 was lower by 38,915 MWh (26 per cent) and the average unit cost of
2 market-priced energy was higher by \$0.46/MWh (2 per cent). BC Hydro also notes
3 that no rate rider charge on RS 1892 energy sales was applicable in Year 4.⁶

4 **1.4 Mid-C Market Pricing**

5 [Figure 2](#) below shows the average daily Mid-C market energy prices in both HLH
6 and LLH for the 2019 Freshet Period, adjusted using the daily Bank of Canada
7 exchange rate. Daily LLH market prices ranged from a low of CAD\$(2.21)/MWh to a
8 high of CAD\$42.76/MWh. Daily HLH market prices ranged from a low of
9 CAD\$0.24/MWh to a high of CAD\$88.16/MWh.

10 **Figure 2 Electricity Market Prices: Mid-C**



11

⁶ BCUC Order No. G-45-19 approved BC Hydro's requested reduction of the DARR from 5 per cent to 0 per cent on an interim basis effective April 1, 2019.

1 [Table 3](#) below provides the weighted average Mid-C prices⁷ in HLH and LLH for
2 each month of the 2019 Freshet Period compared to the 2018 Freshet Period.

3 **Table 3** **Average monthly Mid-C energy prices in**
4 **CAD\$/MWh for 2019 and 2018 Freshet**
5 **Periods**

AVERAGE MID-C PRICES IN FRESHET PERIOD	May	June	July
Low Load Hours (LLH)			
2019 Freshet Period LLH (C\$/MWh)	\$ 11.10	\$ 17.45	\$ 31.24
2018 Freshet Period LLH (C\$/MWh)	\$ (0.24)	\$ 5.89	\$ 41.52
<i>Difference (C\$/MWh)</i>	\$ 11.34	\$ 11.56	\$ (10.28)
High Load Hours (HLH)			
2019 Freshet Period HLH (C\$/MWh)	\$ 20.09	\$ 26.20	\$ 39.28
2018 Freshet Period HLH (C\$/MWh)	\$ 16.35	\$ 21.88	\$ 89.36
<i>Difference (C\$/MWh)</i>	\$ 3.74	\$ 4.32	\$ (50.08)

7 Across the May/June 2019 period, Mid-C market prices were generally higher than
8 for 2018. This was primarily due to lower than average water inflows in the US
9 Columbia river system. Overall average freshet inflows in the US Columbia river
10 system were substantially below normal, at about 93 per cent (April – July) of
11 average. Pend D’Oreille river system flows were also substantially below normal, at
12 about 91 per cent (April – July) of average.

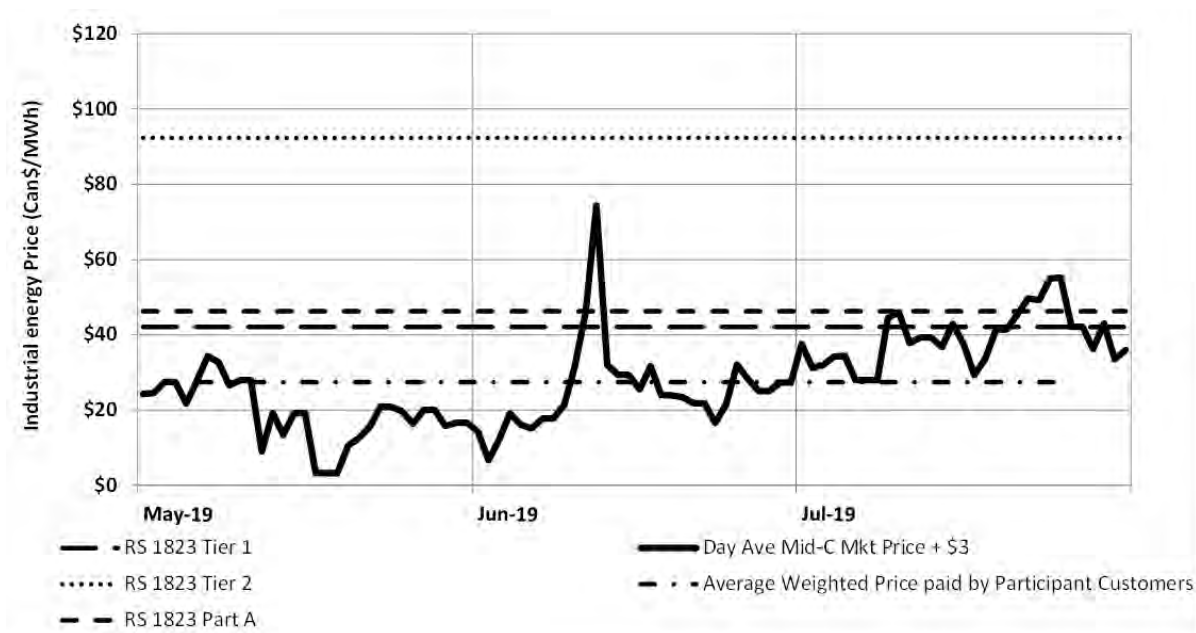
13 For BC Hydro, the lower than normal flow in the Pend D’Oreille system resulted in a
14 decrease in must-run generation at BC Hydro’s Seven Mile and Waneta plants.
15 Lower than average inflows across the BC Hydro system reduced must-run
16 generation from non-storage BC Hydro and IPP resources. In combination, these
17 factors resulted in a significant reduction in the prevalence of forced exports from the
18 BC Hydro system in May and June. In contrast, for the July 2019 period, Mid-C
19 market prices were generally lower than for 2018. This was primarily due to cooler
20 early summer weather in 2019 and an associated lack of air conditioning load in the
21 Pacific Northwest and California.

⁷ Average monthly energy prices are determined using an average of the daily exchange adjusted prices for each of HLH and LLH.

1.5 RS 1892 Energy Pricing

Figure 3 below shows the RS 1823 Tier 1, Tier 2 and RS 1823A energy prices compared to the average weighted daily RS 1892 energy price in HLH and LLH (including \$3/MWh adder) paid by participant customers during the 2019 Freshet Period.

Figure 3 RS 1823 and RS 1892 energy prices (May to July 2019)



For the 2019 Freshet Period, the average daily price for RS 1892 energy in HLH and LLH was usually below the otherwise applicable price(s) for RS 1823 energy. In summary, during the 2019 Freshet Period:

- There were two days where the market price of LLH energy was negative such that the energy charge floor price of \$0/MWh under RS 1892 was applied;
- There were no negative priced HLH days;
- There were two days when the net daily LLH market price (including \$3/MWh adder) was higher than the RS 1823 Tier 1 energy price of 45.35/MWh; and

- There were 13 days when the net daily HLH market price (including \$3/MWh adder) was higher than the RS 1823 Tier 1 energy price of 45.35/MWh.

As shown in [Table 4](#) below, the total average weighted price paid for RS 1892 energy by participant customers was CAD\$27.27/MWh⁸ (includes \$3.00/MWh wheeling rate, excludes taxes). This compares to the RS 1823 Tier 1 energy price of \$45.35/MWh, the RS 1823 Tier 2 energy price of \$101.60/MWh and the RS 1823 Part A energy price of \$50.98/MWh (all prices excluding taxes). For the 2019 Freshet Period, the energy price differential between the average RS 1892 energy price and the RS 1823 Tier 1 energy price was \$18.08/MWh.

Table 4 RS 1823 and RS 1892 energy prices (May to July 2019)

Energy Prices by Rate Schedule	Year 4 (F2020) C\$/MWh
Average RS 1892 energy price (includes wheeling rate)	\$ 27.27
RS 1823 Tier 1 energy price	\$ 45.35
RS 1823 Tier 2 energy price	\$ 101.60
RS 1823 Energy Charge Part A price	\$ 50.98
Energy price differential vs RS 1823 Tier 1	\$ 18.08

Participating RS 1892 customers had advance knowledge of day-ahead market prices for both HLH and LLH and could choose to use energy under RS 1892 when day-ahead market prices were economic relative to RS 1823 energy prices. Customers also realized RS 1823 demand savings in any Billing Period where actual metered demand in HLH was higher than their Reference Demand. Accordingly, it is BC Hydro’s view that the Freshet Rate provided customers with a lower cost option for incremental electricity use.

⁸ The actual price of RS 1892 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Freshet Energy.

1 **1.6 Customer Load Response**

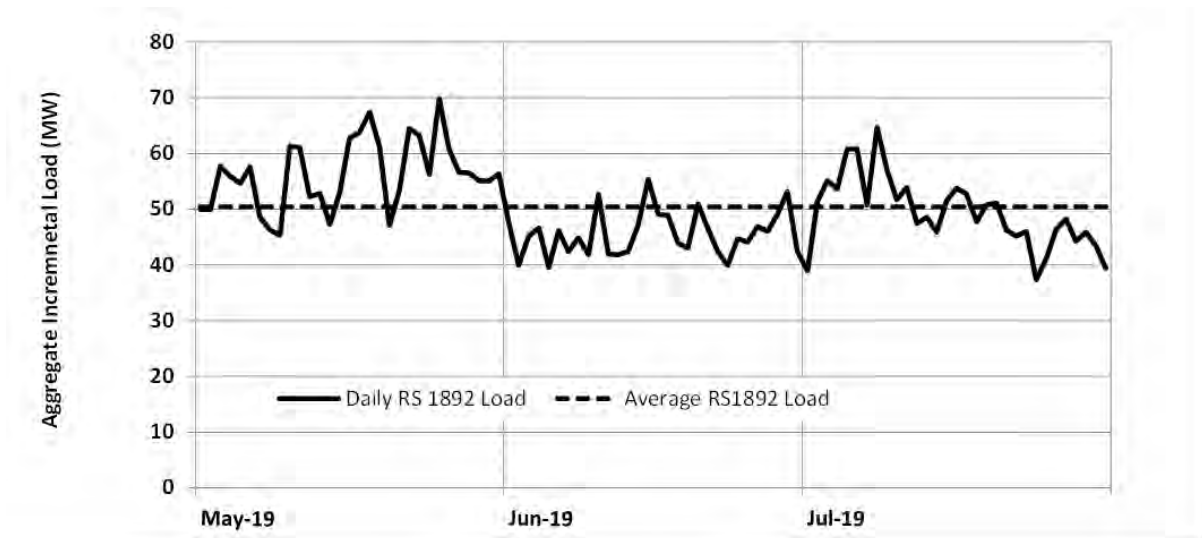
2 [Figure 4](#) below illustrates the aggregate customer response (load shape) to changes
3 in market prices. In May 2019, customers appeared to operate their facilities to
4 optimize electricity costs such that the aggregate load increase was highest when
5 market energy reference prices were lowest. In contrast, there is no observed
6 correlation between the June customer load response and market energy reference
7 prices. There is a weak positive correlation between the July customer load
8 response and market energy reference prices (e.g. higher load at lower prices, and
9 vice versa).

10 From the participant customer survey responses, BC Hydro understands that many
11 customer participants made plans to increase operations during May on the premise
12 (based on their experience from prior years) that market prices would be low. This
13 premise proved to be accurate.

14 However, customers were less certain that prices would remain low through the
15 June and July periods. Accordingly, some customers planned to reduce their take of
16 incremental energy in June and July to reduce the risk of a sudden market energy
17 price spike.

1
2

Figure 4 Aggregate incremental RS 1892 load (May to July 2019)



3

4 In terms of the speed of customer response, some customers advised that they were
5 closely monitoring daily market prices to make daily operating decisions. Refer to
6 sample of customer survey responses below for context:

7 “We compared the day-ahead market pricing information to our
8 “all in” Tier 1 pricing. If the day-ahead market price was below
9 such price, load was increased to maximize Freshet energy
10 purchases; if it’s above, we reduced load to baselines.”

11 “We reviewed day-ahead pricing daily and in the context of time
12 remaining to end of term (31 July). No hard threshold was set.”

13 “We watched prices closely to ensure our cumulative load
14 increases were economic. The (economic) threshold changes
15 based on achieved savings to date...”

16 Other customers advised that daily pricing did not influence their operating decisions
17 either because they were not actively monitoring daily market prices or had already
18 made an advance commitment to higher operating levels and sales with the
19 expectation of lower average market prices over the freshet period. Refer to sample
20 of customer survey responses below for context:

1 *“We just monitored pricing, but it didn’t affect our actions.”*

2 *“The (daily) pricing was not used to take specific actions. There*
3 *was a maximum price threshold set (for the freshet period).”*

4 *“We generally didn’t use day to day information, planning was*
5 *done at a monthly level.”*

6 **1.7 Service Considerations**

7 **1.7.1 Interruption**

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

11 **1.7.2 RS 1880 Replacement Service**

12 Of the 37 customer participants, BC Hydro has determined that a total of five
13 customers with self-generation facilities took service under RS 1892 during Year 4.
14 Of these, only one customer site was verified to have used RS 1892 as a substitute
15 for RS 1880 during the 2019 Freshet Period. This was due to an extended event of
16 generator curtailment. BC Hydro considers that the customer would have normally
17 requested RS 1880 service during the period of generator curtailment, but for the
18 availability of RS 1892. Events of voluntary self-generation curtailment are not
19 relevant to this analysis because they reflect a direct customer action to increase
20 load under RS 1892 (e.g., the desired outcome) as opposed to an event of generator
21 outage that BC Hydro considers would have occurred anyway.

22 **1.8 Financial Considerations**

23 **1.8.1 Wheeling Rate**

24 Directive 4b of Commission Order No. G-17-16 directed BC Hydro as part of its
25 reporting to address and, where appropriate, evaluate the energy adder (wheeling
26 rate) under RS 1892 as compared to FortisBC Inc.’s standby rate. BC Hydro’s
27 RS 1892 energy adder (wheeling rate) is \$3.00/MWh and FortisBC Inc.’s standby

1 rate is \$4.00/MWh (as shown in Schedule 37 for Large Commercial Standby
2 Service).⁹ The difference is \$1.00/MWh. For Year 4, if the RS 1892 energy adder
3 (wheeling rate) had been \$4.00/MWh, this would have provided an additional
4 \$111,468 of revenue. This analysis assumes the same total RS 1892 energy volume
5 of 111,468 MWh (i.e., that the higher rate would have had no impact on customer
6 participation). As described in BC Hydro's Final Evaluation Report, BC Hydro
7 remains of the view that the \$3.00/MWh energy adder (wheeling rate) is appropriate.

8 **1.8.2 Incremental Costs**

9 As of September 2019, BC Hydro has incurred approximately \$50,000 in
10 incremental costs specific to implementation and billing of the Year 4 Pilot. All other
11 staff and administration costs were funded under existing operating budgets.

12 **1.8.3 Ratepayer Impact Analysis**

13 The following describes the process and approach that BC Hydro used to determine
14 the preliminary Year 4 impacts. BC Hydro's analysis methodology¹⁰ represents a
15 historical assessment of daily system conditions. System operations were examined
16 to determine the marginal resource that was deemed to serve incremental RS 1892
17 HLH and LLH energy volumes during each day of the 2019 Freshet Period. The
18 marginal resource is either market (Mid-C) during HLH or LLH or BC Hydro's large
19 basin system generation on a daily basis, as explained below.

20 **Condition 1: Minimum generation with forced export**

21 When BC Hydro is experiencing a minimum generation constraint, and net exports
22 are forced to avoid spill, incremental domestic sales under RS 1892 will reduce
23 forced exports. Holding market price constant, BC Hydro will see an approximate
24 revenue gain equal to the sum of the CAD \$3.00/MWh energy adder (wheeling rate)

⁹ Schedule 37 can be found in FortisBC Inc's Electric Tariff at
<https://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/Documents/FortisBCElectricTariff.pdf>.

¹⁰ Refer to BC Hydro's Final Evaluation Report for a more detailed description of the methodology.

1 collected under RS 1892 and the avoided USD \$5.16/MWh wheeling fee plus
2 1.9 per cent transmission loss charge for avoided energy delivery from the BC
3 border to the Mid-C market (converted to Canadian dollars). This gain is roughly
4 equal to \$10.00/MWh.

5 **Condition 2: Minimum generation with economic import**

6 When BC Hydro is experiencing a minimum generation constraint, while importing
7 on an economic basis, incremental domestic sales under RS 1892 are deemed to be
8 served from market imports. Holding market price constant, BC Hydro will see an
9 approximate revenue loss equal to the difference between the CAD \$3.00/MWh
10 energy adder (wheeling fee) collected under RS 1892 and the US \$5.16/MWh
11 wheeling fee and 1.9 per cent transmission losses charge converted to Canadian
12 dollars paid for energy delivery from the Mid-C market to the BC border. This loss is
13 roughly equal to \$4.00/MWh. On any days where the market price is negative, the
14 revenue loss from deemed market imports will be reduced by the difference between
15 the actual market price and the \$0/MWh floor price under RS 1892 (considered as
16 market floor price differential in the calculation above).

17 **Condition 3: Higher basin generation on the margin**

18 Holding import/export volumes constant, the loading of BC Hydro's large basin
19 generation will be increased to serve additional RS 1892 load. BC Hydro considers
20 that the cost consequence (revenue gain or loss) of this circumstance can be
21 estimated by comparing the actual revenue gained from RS 1892 energy sales with
22 the deemed value of the water/energy removed from the BC Hydro large basin to
23 serve the additional load rather than being held in storage. The value of the
24 incremental generation from the large basin that is operated to serve the load can be
25 expressed as a daily System Marginal Value. For the 2019 Freshet Period, a daily
26 System Marginal Value was determined for each of BC Hydro's Kinbasket and
27 Williston reservoirs in HLH and LLH:

-
- 1 • For Kinbasket reservoir, marginal values ranged from CAD \$47 to \$50/MWh.
2 This compares to CAD \$21 to \$35/MWh in 2018; and
- 3 • For Williston reservoir, marginal values ranged from CAD \$47 to \$49/MWh.
4 This compares to CAD \$22 to \$28/MWh in 2018.

5 For any day where basin energy was deemed to serve incremental RS 1892 loads,
6 the difference between the value of actual RS 1892 energy sales and BC Hydro's
7 System Marginal Value was used to determine the revenue gain or loss on that day.

8 [Table 5](#) below shows the estimated ratepayer impact by month for each of the three
9 marginal resource conditions across the entire four year period of the Freshet Rate
10 pilot. For Year 4, BC Hydro experienced a revenue loss of \$0.5M. This compares to
11 revenue gains of \$2.3M in Year 1, \$2.2M in Year 2 and \$1.9M in Year 3.

1
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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

3 As shown in [Table 5](#) above, BC Hydro is reporting a revenue loss of approximately
4 \$0.5 million for Year 4. This is due primarily to the higher marginal price of
5 BC Hydro’s system storage compared to the Mid-C marginal price used to price RS
6 1892 energy purchases. BC Hydro anticipated this outcome in advance, given the
7 adverse hydrology conditions that BC Hydro faced leading into the 2019 Freshet
8 Period, combined with an expectation of below normal inflows.
9 Specifically, the combination of low storage prior to the 2019 Freshet Period and
10 lower than average inflows during the 2019 Freshet Period resulted in a reduced

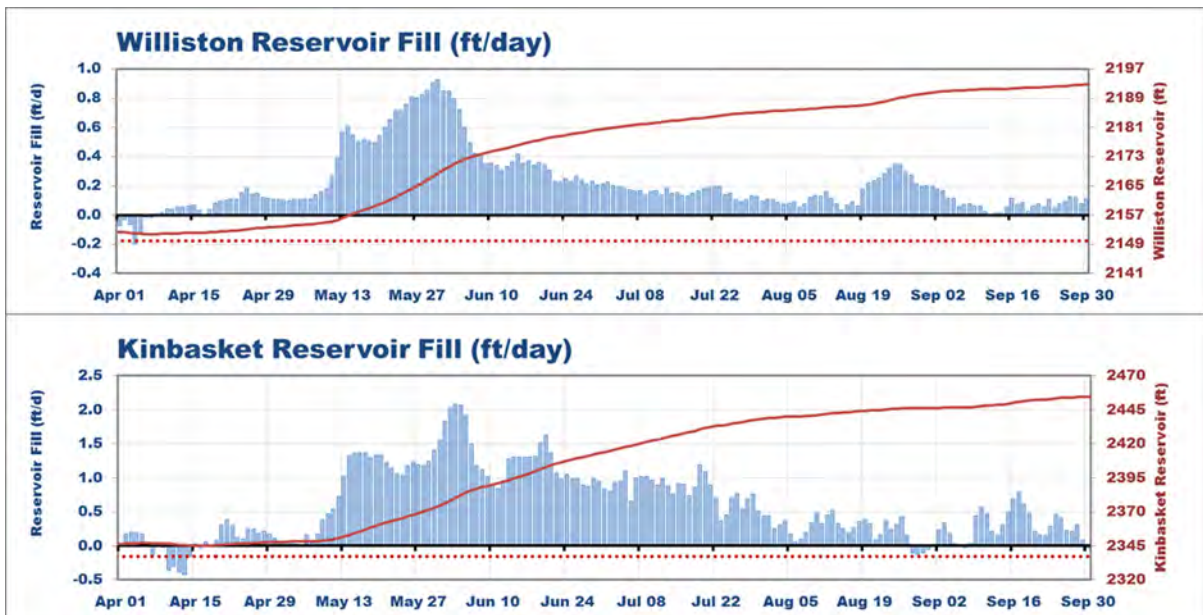
1 freshet surplus and greater physical capability to accept market energy imports.
 2 Further, the resultant high System Marginal Prices increased the economic
 3 motivation for market energy imports and reduced the economic value of
 4 incremental freshet period energy sales to domestic customers. These conditions
 5 are discussed in more detail below.

6 **1.8.4 Discussion of 2019 Freshet Period Conditions**

7 Entering into the 2019 Freshet Period, it was known to BC Hydro that conditions
 8 were different than in previous years. Across the winter of 2018/2019, low winter
 9 inflows into the BC Hydro system in combination with the Enbridge Gas Pipeline
 10 explosion (that impacted thermal generation) resulted in strong downward pressure
 11 on system storage. Williston and Kinbasket Reservoirs both approached record
 12 minimum storage levels. Williston reservoir levels dropped to 2,151 feet and
 13 Kinbasket reservoir levels dropped to 2,345 feet. Refer to [Figure 5](#) below.

14
15

Figure 5 Williston and Kinbasket Reservoir fill rates and levels for 01 Apr – 30 Sep 2019



1 In response to these low storage levels, coupled with anticipated low 2019 freshet
2 inflows, BC Hydro's System Marginal Price for storage at Williston and Kinbasket
3 was increased. For example, as described above, System Marginal Prices for the
4 2019 Freshet Period were significantly higher (e.g., approximately double) relative to
5 the 2018 Freshet Period.

6 In addition, the weak freshet in 2019 resulted in lower must-run hydro power
7 generation from non-storage BC Hydro and IPP facilities. Taken together, this led to
8 a significant reduction in BC Hydro's normal freshet surplus and opened room for
9 BC Hydro to purchase market energy across the majority of the May/June period.
10 The outcome during the 2019 Freshet Periods was a strong bias of overall system
11 operations towards market energy imports whereas the normal freshet period bias is
12 to energy exports. These factors motivated BC Hydro to import market energy to
13 support system storage levels.

- 14 • For example, in the 2019 Freshet Period, there were only 10 HLH days and
15 14 LLH days with net market energy exports. This compares to the 2018
16 Freshet Period (with 29 HLH and 32 LLH days of net market exports) and the
17 2017 Freshet Period (with 47 HLH and 12 LLH days of net market exports).

18 **1.8.5 Implications for Permanent Freshet Rate**

19 As described in the Final Evaluation Report, the Freshet Rate produced benefits for
20 participants and nonparticipant ratepayers over the initial three-year pilot term.

21 These benefits were expected to continue unless conditions substantially changed.

22 In this respect, BC Hydro notes that Year 4 of the Freshet Rate pilot did represent a
23 change in conditions compared to Years 1-3. As described above, conditions during
24 the May-July 2019 freshet period were characterized by low reservoir levels,
25 reduced thermal generation due to Enbridge pipeline explosion and below average
26 inflows. This reduced the freshet energy surplus and contributed to higher system
27 marginal prices and higher market energy imports. Even with these conditions, the

1 2019 Freshet Period revenue loss is modest when compared to the revenue gains
2 over the prior three freshet periods. For the entire Freshet Rate Pilot period, the total
3 revenue gain is \$5.8 million.

4 BC Hydro considers this result to demonstrate that the Freshet Rate design is robust
5 and, when assessed over multiple years, able to prudently and efficiently drive
6 incremental energy sales from participant customers while protecting the interests of
7 non-participant ratepayers.

**Transmission Service Market Reference
Priced Rates Application**

**Appendix F
Letters of Support**



Barristers & Solicitors / Patent & Trade-mark Agents

October 29, 2019

Sent by E-mail

BC Hydro
333 Dunsmuir St., 4th Floor
Vancouver, BC V6B 5R3

**Attention: David G. Keir, Senior Manager,
Transmission Rates and Large
Customer Rate Operations**

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Our reference 1000388060

Dear Mr. Keir:

BC Hydro Transmission Service – Market Reference-Priced Rates Application (Application)

We are legal counsel to the Association of Major Power Customers (**AMPC**) in this matter, and write on its behalf to provide AMPC's support for BC Hydro's Application seeking BC Utilities Commission approval of:

- an amended Freshet Rate (RS 1892) effective April 1, 2020 on an ongoing basis, in compliance with Directive 4 of BCUC Order G-106-19 dated May 22, 2019, as revised by BCUC Order G-224-19 dated September 13, 2019; and
- the Incremental Energy Rate Pilot (RS 1893) on a pilot basis for a total of 51 months beginning January 1, 2020 and ending March 31, 2024 (the end of BC Hydro's fiscal year).

AMPC has reviewed a draft version of the Application and supports it for the reasons below.

Background

As you know, AMPC is a not-for-profit industrial association that represents major resource-based industrial operators in BC that are active in the forestry, pulp and paper, mining, and electrochemical industries. AMPC members' electricity consumption represents about 20% of domestic energy load in BC. AMPC's mandate is to represent its members' interests concerning electricity regulatory and policy issues, particularly access to reliable electric power at competitive, fair, and stable rates.

Support for Freshet Rate and Incremental Energy Rate Pilot

AMPC's members are Rate Schedule 1823 (RS 1823) customers, and broadly support additional, optional, non-firm / interruptible electricity service to transmission service customers. In the past, AMPC and its predecessors have encouraged the development of optional rate programs because they allow AMPC members to operate idle and/or flexible production capacity that would be underutilized in the absence of these rates. Industrial customers' unit cost of electricity decreases, while creating system benefits for BC Hydro and other customer

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October 29, 2019



classes in a “win-win-win” scenario. These programs can generate increased revenues for BC Hydro, promote competitiveness, send important price signals, and contribute to efficient pricing. They also bring BC Hydro’s offerings closer in line with similar options already offered by comparable Canadian utilities, such as Manitoba Hydro and Hydro Quebec.

For these reasons, AMPC supports both the permanent Freshet Rate with an effective date of April 1, 2020 and the Incremental Rate Pilot with an effective date of January 1, 2020:

- The proposed permanent Freshet Rate continues the successful Freshet Rate Pilot that was in place between 2016 and 2019 on substantially the same terms and conditions. AMPC has long-supported freshet rates, actively participated in the successful four-year Freshet Rate Pilot and looks forward to continued access to this rate option.
- The proposed Incremental Energy Rate Pilot is an important new interruptible rate. It provides a straightforward means to provide year-round access to an interruptible rate, which is imperative given BC Hydro’s anticipated energy surplus in the coming years.
- AMPC understands BC Hydro is able to determine customer baselines and implement billing with 30 days advance notice if the Commission approves implementation of RS 1893 on an interim basis effective January 1, 2020. Interim approval is appropriate given customers’ robust experience with the Freshet Rate Pilot and BC Hydro’s in-depth Incremental Energy Rate consultation. The January 1, 2020 effective date would also allow customers to opt-in and utilize the rate sooner than would otherwise be the case, and align with most AMPC members’ financial reporting periods, reducing administrative complexity.

Consultation Process

AMPC attended BC Hydro’s workshops on the Application and met with BC Hydro to provide its feedback on both rate options on multiple occasions. At this stage, the potential AMPC members that would participate in the rate offerings are very familiar with the proposed mechanics, and AMPC is satisfied that its feedback has been sufficiently incorporated into the design.

Conclusion

AMPC appreciates the opportunity to provide its comments to BC Hydro and the Commission. Both industrial and other customer classes stand to benefit from the efforts that BC Hydro undertook to evaluate the merits of the proposed rates and engage in customer consultation and discussion.

Please contact the writer if you have any questions.

Yours very truly,

A handwritten signature in black ink, appearing to read "Matthew D. Keen".

Matthew D. Keen
MDK/roe



October 30, 2019

BC Hydro
 333 Dunsmuir St., 4th Floor
 Vancouver, BC V6B 5R3
**Attention: David G. Keir, Senior Manager,
 Transmission Rates and Large
 Customer Rate Operations**
 VIA: E-mail

**RE: COPPER MOUNTAIN MINE (BC) LTD. (The “Company”)- BC Hydro Transmission Service –
 Market Reference-Priced Rates Application**

Dear Mr. Keir,

Copper Mountain Mine (BC) Ltd. writes to provide CMMBC support for BC Hydro's Application seeking BC Utilities Commission approval of:

- an amended Freshet Rate (RS 1892) effective April 1, 2020 on an ongoing basis, in compliance with Directive 4 of BCUC Order G-106-19 dated May 22, 2019, as revised by BCUC Order G-224-19 dated September 13, 2019; and
- the Incremental Energy Rate Pilot (RS 1893) on a pilot basis for a total of 51 months beginning January 1, 2020 and ending March 31, 2024 (the end of BC Hydro's fiscal year).

Copper Mountain has reviewed a draft version of the Application and supports it for the reasons below:

Background

Copper Mountain Mine (BC) Ltd is a large open pit copper mine located near the rural BC interior town of Princeton. The mine directly employs 490 employees and is a major economic contributor to the southern interior region. Copper Mountain is one BC Hydro's largest transmission customers consuming over 510 GWh per year. Copper Mountain has announced some ambitious and exciting growth and development plans for the Princeton Mine in order to fully realize this potential the mine requires access to lowest cost incremental energy to support the growth plan. In 2020 forecasted load growth for the mine may reach an additional 130 GWh on an annual demand. Copper Mountain has invested in new assets which have the ability to consume additional power in the grinding circuit. In addition In F19 the mine has exceeded 100% of its CBL. The cost of purchasing additional energy at 1823 Tier 2 rates provide unfavorable economics for load growth given current low copper prices.

Support for Freshet Rate and Incremental Energy Rate Pilot

The development of optional rate programs may provide incentive for CMMBC to operate idle capacity and to complete the plant production capacity expansion that may be otherwise underutilized in the absence of these rates. CMMBC's unit cost of incremental electricity purchase would decrease, while creating system benefits for BC Hydro and other customer classes. These optional rate programs can generate increased revenues for BC Hydro, promote competitiveness, send important price signals, and contribute to efficient pricing. They also bring BC Hydro's offerings closer in line with similar options already offered by comparable Canadian utilities. For these reasons, CMMBC supports both the permanent Freshet Rate with an effective date of April 1, 2020 and the Incremental Rate Pilot with an effective date of January 1, 2020:

1700 – 700 West Pender Street, Vancouver, BC V6C 1G8
 Tel: 604-682-2992 Fax: 604-682-2993

- The proposed permanent Freshet Rate continues the Freshet Rate Pilot that was in place between 2016 and 2019 on substantially the same terms and conditions. CMMBC has been an active participant in the freshet rates.
- The proposed Incremental Energy Rate Pilot is an important new interruptible rate. It provides a simple means to provide year-round access to an interruptible rate, which is imperative given BC Hydro's anticipated energy surplus in the coming years.
- CMMBC has been advised that BC Hydro is able to determine customer baselines and implement billing with 30 days advance notice if the Commission approves implementation of RS 1893 on an interim basis Effective January 1, 2020. Interim approval is appropriate given CMMBC experience with the Freshet Rate Pilot and BC Hydro's in-depth Incremental Energy Rate consultation, The January 1, 2020 effective date would also allow customers to opt-in and utilize the rate sooner than would otherwise be the case, and align with CMMBCs' financial reporting period, reducing administrative complexity.

Consultation Process

CMMBC attended BC Hydro's workshops on the Application and met with BC Hydro to provide its feedback on both rate options on multiple occasions. At this stage, CMMBC would participate in the rate offerings and is familiar with the proposed mechanics. CMMBC is satisfied that its feedback has been sufficiently incorporated into the design.

Conclusion

CMMBC appreciates the opportunity to provide its comments to BC Hydro and the Commission. We look forward to being able to utilize these proposed market rate alternatives to generate increased economic development at its Copper Mine in the rural community of Princeton.

Yours very truly,

Yours truly,



WALT HALIPCHUK, SCMP, CPA, CMA

Director Administration & Energy Management

Suite 1700, 700 West Pender Street
Vancouver, BC V6C 1G8

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October 29, 2019

Delivered by Email

Mr. David G. Keir
 Senior Manager, Transmission Rates and Large Customer Rate
 Operations, Customer Services
 BC Hydro
 333 Dunsmuir Street
 16th Floor, Vancouver, BC
 V6B 5R3

Dear Mr. Keir,

RE: Transmission Service Market Reference-Priced Rates Application

Thank you for asking ERCO Worldwide, A division of Superior Plus LP ("ERCO"), to provide comments on the current Transmission Service Market Reference-Priced Rates Application.

ERCO is a producer of electro-chemicals, and we own and operate a plant located in North Vancouver. The plant is electricity intensive, and relies heavily on exports. The chemical we produce at that plant, sodium chlorate, requires 5.5 MWh of electrical energy per tonne of dry product shipped, and nearly two thirds of it is shipped to international markets. Electricity typically accounts for 70% of the product's variable cost. Increases in electricity cost erode the product's contribution margin - and therefore its competitiveness, far quicker than for other products for which electricity is costed and treated as utility. ERCO must control its electricity cost in order to remain globally competitive and commercially viable. ERCO welcomes and supports BC Hydro's introduction of the market reference-priced rates. Such rates enable companies like us to better manage our costs. ERCO is a member of the Association of Major Power Customers of BC ("AMPC"), and we subscribe to the principles that AMPC has made concerning this application.

Request a fast-tracked approval with Jan 2020 commencement

ERCO prefers and recommends a rapid start to the Market Reference-Priced rates, in particular, the Incremental Energy Rate Pilot. Indeed, ERCO has idled production capacity at our North Vancouver plant – capacity that we are unable to use at the current Tier 2 energy rate level because doing so would result in a cash cost to produce above the selling price. Our short term plan is



Engineering • Research • Commitment • Optimization

ERCO Worldwide

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 Toronto, Ontario M9B 6C7

Tel: 416-239-7111
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Web: www.ercoworldwide.com



to begin ratcheting production down in the first quarter of 2020 if the Incremental Energy Rate Pilot does not start on January 1, 2020. This will result in both lost revenue to BC Hydro, and lost production to ERCO. Given the past four years' experience with the Freshet rate, ERCO strongly believes that the market is prepared and ready, and that there is little reason to wait for August to start the pilot. In fact, the results from the past four years of experience show that the rate is good for BC Hydro, and its customers.

Customers were consulted on the new rates by BC Hydro

BC Hydro provided ample opportunity for the AMPC and customers to review and provide feedback on the proposed new rates; likewise, it provided the necessary information and context required to make that feedback meaningful. In addition, BC Hydro clearly communicated how customer input has been incorporated into the application.

ERCO is grateful for having been provided the opportunity to review the final rate design proposal and is encouraged by the respectfulness and responsiveness shown by BC Hydro towards its stakeholders during the process.

Our business plan hinges on electricity costs, and planning for these costs has been difficult through this transition period. ERCO would really appreciate a fast-tracked approval leading to a January 2020 start of the Incremental Energy Rate Pilot. With less than two-and-a-half months left in the calendar year, timing is pressed. To that end, ERCO supports BC Hydro's proposed flat energy charge adders of \$7/MWh in non-freshet months, and \$3/MWh in freshet months, as well as using the default baseline period of F2019 for the Incremental Energy Rate.

Thank you for your consideration of this matter, we look forward to operating under the new rate structure and pilot.

Sincerely,

A handwritten signature in black ink, appearing to read "John Christie".

For: John Christie
 Vice President, Operations
 ERCO Worldwide, A division of Superior Plus LP



Re: 108267

October 30, 2019

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

Email: Commission.Secretary@bcuc.com

Re: BC Hydro's Transmission Service Market Reference-Priced Rates Application

Dear Mr. Wruck:

This letter is to express the support of the British Columbia (BC) Ministry of Energy, Mines and Petroleum Resources (EMPR) for BC Hydro's Transmission Service Market Reference-Priced Rates Application (Application).

As a result of the 2013 Industrial Electricity Policy Review (IEPR), BC Hydro was directed, among other things, to look at potential arrangements for industrial power consumers to take advantage of their flexibility, such as time of use rates and interruptible rates, where these rates could benefit both those participating industrial customers and non-participating BC Hydro ratepayers. The freshet rate pilot is a result of this process and Government is supportive of the continuation of RS 1892 on an ongoing basis given that it has benefitted both industry and BC Hydro's ratepayers and is consistent with EMPR's and BC Hydro's affordability mandate. EMPR is also supportive of BC Hydro offering a year-round market reference priced rate through its proposed Incremental Energy Rate Pilot (RS 1893) which also supports recommendations of the IEPR.

In addition, the BC Government's February 2019 "Comprehensive Review of BC Hydro: Phase 1 Final Report" indicated that BC Hydro is pursuing strategies to grow domestic electricity demand including "exploring the option to offer current industrial customers year around access to real time, market-based pricing for incremental energy purchases."

.../2

**Ministry of Energy, Mines
 and Petroleum Resources**

Assistant Deputy Minister
 Electricity and Alternative
 Energy Division

Mailing Address:
 PO Box 9314, Stn Prov Govt
 Victoria, BC V8W 9N1

Location:
 4th Floor
 1810 Blanshard Street
 Victoria

As reported in BC Hydro's application, over the four years of the pilot, the freshet rate drove participation from approximately 30% of the transmission customer class, increased domestic energy sales by 569 gigawatt hours and revenue by \$14.9 million and had an estimated positive ratepayer impact of \$5.8 million.

Further, Association of Major Power Consumers (AMPC) members have noted that they have been able to increase their production and improve their competitiveness as a result of the freshet rate pilot. This is evidence of RS 1892 supporting the *Clean Energy Act* energy objective to encourage economic development and the creation and retention of jobs.

AMPC's input has been taken into consideration by BC Hydro over the course of the freshet pilot and as part of designing the Incremental Energy Rate. As a result of this information sharing, AMPC has communicated, to both EMPR and BC Hydro, their members' desire to make the freshet rate permanent and for BC Hydro to offer the Incremental Energy Rate through a new pilot program.

EMPR is supportive of an ongoing freshet rate and the year-round market reference-based rate insofar as ratepayers, over a multi-year period, benefit along with participating industrial customers. Also, EMPR is aware of AMPC's request to commence the Incremental Energy Rate Pilot on January 1, 2020, and we are supportive of the program starting as soon as possible to benefit industry and ratepayers.

Sincerely,



Les MacLaren
Assistant Deputy Minister
Electricity and Alternative Energy Division
BC Ministry of Energy, Mines and
Petroleum Resources

pc: Mr. Fred James
Chief Regulatory Officer
BC Hydro
Email: Fred.James@bchydro.com

Mr. Carlo Dal Monte
Chair
Association of Major Power Consumers
Email: Carlo.DalMonte@catalystpaper.com

**Transmission Service Market Reference
Priced Rates Application**

**Appendix G
Engagement Summary Reports**

January 08, 2019

333 Dunsmuir St, Vancouver, BC, V6B 5R3

BC HYDRO



ENGAGEMENT SUMMARY REPORT

TRANSMISSION SERVICE RATES COMMENTS AND FEEDBACK

**From October 2018
Transmission Service
Rate Design Workshops**

NOTE: This report only contains feedback related to BC Hydro's proposal for a permanent Freshet Rate and Incremental Energy Rate Pilot and is provided in support of BC Hydro's Market Reference-priced Rate Application.

Transmission Service Rates www.bchydro.com

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EXECUTIVE SUMMARY

BC Hydro has approximately 150 industrial load customers served electricity at transmission voltage. The transmission customer class is presently dominated by resource-dependent industry such as forestry, mining, electrochemical and oil/gas with large electrical loads. These loads are dynamic. BC Hydro seeks to retain and diversify its industrial customer base by providing electricity service to existing and new transmission customers at competitive rates that reflect its cost of service.

In October 2018, BC Hydro engaged with customers, industry and key stakeholders on two existing and three prospective transmission service rate designs. These five rate designs are listed below:

Transmission Service Rate Design	Service Type	Status
RS 1823 Stepped Rate	Firm service	Existing default rate
RS 1892 Freshet Rate	Non-firm service	Existing optional rate
Incremental Energy Rate	Non-firm service	Proposed optional rate
Load Attraction Rate	Discounted firm service	Proposed optional rate
Load Retention Rate	Discounted firm service	Proposed optional rate

Rate design workshops were held between October 11th and 17th 2018 to review and discuss these five rate designs. BC Hydro sought verbal and written feedback from the 105 participants that attended. This Report is a consolidated summary of BC Hydro's engagement process, feedback received and reporting of results. Feedback themes for each of the five rate designs are summarized below.

RS 1892 Freshet Rate

- 78% of respondents support the Freshet Rate continuing - although there was no clear preference as to whether the rate should continue as a pilot or as a permanent rate.
- Concerns were raised about Mid-C price variability (price spikes in late July) and seasonal billing.

Incremental Energy Rate

- 38% of respondents support the development of an annual market reference-price rate; this response contrasts with the 45% of survey participants who were unsure or did not respond.
- There was clear support (66% of respondents in favour) for proposed rate design principles and the "Strawman" rate design concept to provide an annual non-firm service option for incremental electricity use with monthly settlement.

INTRODUCTION

BACKGROUND

BC Hydro conducted four transmission service rate design workshops (Workshops) in October 2018. Invitations were extended to existing transmission service customers, prospective new customers, registered interveners and interested parties. The purpose of the Workshops was to provide participants with an opportunity to inform the design of electricity supply rates for BC Hydro's transmission service customers, including new optional rates. The objective of this report is to summarize the written and verbal feedback obtained from the Workshops for BC Hydro's consideration.

REPORT STRUCTURE

This report provides: (a) an overview of BC Hydro's engagement process; (b) a consolidated summary of comments and feedback received; and (c) reporting of survey results. Written feedback was provided to BC Hydro via a written Feedback Form. Verbal feedback was provided to BC Hydro in the Workshops and captured in minutes which BC Hydro has termed "Summary Notes". Written feedback and survey results are summarized in this report for each of the six categories set out below. For this purpose of this engagement report only customer responses for Part 2: RS 1892 Freshet Rate and Part 3: Incremental Energy Rate are summarized:

- ❖ ~~Part 1: RS 1823 Pricing Principles~~
- ❖ **Part 2: RS 1892 Freshet Rate**
- ❖ **Part 3: Incremental Energy Rate**
- ❖ ~~Part 4: Load Attraction Rate~~
- ❖ ~~Part 5: Load Retention Rate~~
- ❖ ~~Part 6: Additional Comments/Feedback~~

The write-up for each category includes: (1) a short background description of the rate design; (2) key topics presented for review and discussion; (3) feedback themes; and (4) summary of participant feedback.

Copies of the presentation slides used in the Workshop, the Feedback Form, and Summary Notes for each Workshop are located at:

https://www.bchydro.com/toolbar/about/planning_regulatory/regulatory.html

TSR WORKSHOPS

A total of four half-day Workshops were conducted by BC Hydro between 11 October and 17 October 2018. The Workshops were presented by BC Hydro staff from Customer Service and Regulatory. There was no charge to attend.

- ❖ Workshops were held as follows:
 - 11 October 2018 - Vancouver (BC Utilities Commission Hearing Room);
 - 12 October 2018 - Prince George (BC Hydro Regional Office);
 - 16 October 2018 - Kamloops (local hotel); and
 - 17 October 2018 - Calgary (local hotel).
- ❖ Each Workshop session was approximately 3.15 hours in length, starting at 8:45 am and ending at 12:00 pm.
- ❖ Invitations were extended to existing transmission service customers, prospective new customers, registered interveners and interested parties.
- ❖ Representatives from all existing transmission service customer accounts were invited to attend. The customer list was selected by BC Hydro Key Account Managers.
- ❖ Invitations were sent via email by BC Hydro staff approximately 2-3 weeks prior to the date of the first Workshop. Follow-up email invitation reminders were sent leading up to the start of the Workshops.
- ❖ Various BC Hydro Key Account Managers and support staff attended Workshops with customers from their account portfolios. Note: BC Hydro staff are not included in attendee numbers.
- ❖ The Vancouver Workshop included a webcast service for participants unable to attend in person.

Number of Attendees by Workshop Location

WORKSHOP LOCATION	NO. OF ATTENDEES	FEEDBACK FORMS RECEIVED
Vancouver (in person)	49	31 (in-person and webcast)
Vancouver (webcast)	27 (registered)	
Prince George	13	8
Kamloops	10	6
Calgary	6	2
TOTAL	105	47

ENGAGEMENT PROCESS

The purpose of the Workshops was to provide information and seek comments and feedback on a total of five transmission service rate topics (2 existing, 3 proposed):

- (1) RS 1823 Pricing Principles - existing;
- (2) RS 1892 Freshet Rate - existing;
- (3) Incremental Energy Rate - proposed;
- (4) Load Attraction Rate - proposed; and
- (5) Load Retention Rate - proposed.

The summary below describes how written and verbal feedback was collected and reported.

Written Feedback

Written feedback was collected by BC Hydro using a Feedback Form distributed to participants at each Workshop. Written feedback was provided in two ways: (1) a check-box to record participant opinions/preferences for each scope item identified by BC Hydro; and (2) sections provided for additional comments. Written comments have been consolidated, grouped by scope item, and reported in feedback summary tables as set out below. Only the location specific to each comment has been used to preserve individual customer confidentiality.

Verbal Feedback:

At each Workshop, detailed minutes were kept of participant questions/comments and BC Hydro's response. Workshop minutes (Summary Notes) are available at:

https://www.bchydro.com/toolbar/about/planning_regulatory/regulatory.html

PART 2: RS 1892 FRESHET RATE PILOT – Market Reference Priced Rate

Background:

BC Hydro's Rate Schedule 1892 – Transmission Service - Freshet Energy (Freshet Rate or RS 1892) was approved on February 9, 2016 for a two-year pilot (Freshet Pilot or Pilot). BC Hydro subsequently applied to extend the Freshet Rate Pilot for a third year until December 31, 2018. The Freshet Rate was proposed to assist in the management of a seasonal energy surplus during the freshet period of May through July by encouraging industrial customers to use more electricity. BC Hydro's system energy surplus arises during freshet from high system inflows combined with an increase in must-take generation from Independent Power Producers and low domestic loads. The Freshet Rate helps to mitigate this unique system condition by providing BC Hydro with options to reduce the volume of surplus energy forced to export markets and reduce spill risk at BC Hydro facilities. The Freshet Rate was also in response to the 2013 Industrial Electricity Policy Review (IEPR) task force recommendations to develop innovative rate options for industrial customers.

Key Topics for Review and Discussion:

- ❖ Background on Freshet Rate Pilot and the premise of the freshet rate
- ❖ Optional non-firm interruptible rate for existing RS 1823 customers specific to the May 1st to July 31st Freshet period only
- ❖ Rate design elements:
 - Incremental energy consumption relative to a baseline of expected RS 1823 use in Heavy Load Hours (HLH) and Light Load Hours (LLH) is subject to Mid-Columbia (Mid-C) market-based pricing plus a fixed \$3/MWh wheeling rate with no demand charge for load > Reference Demand;
 - Seasonal baselines and seasonal billing reconciliation.

Feedback Themes:

- There was clear support (78% in favour as per Figure 2 below) for the Freshet Rate to continue as a rate option.
- BC Hydro did receive participant customer feedback which targeted two specific aspects of the rate design: (1) seasonal billing methodology; and (2) timing of the freshet period.

Summary of Participant Feedback:

2.1 Continuing Freshet Rate Service

Figure 2.1.1

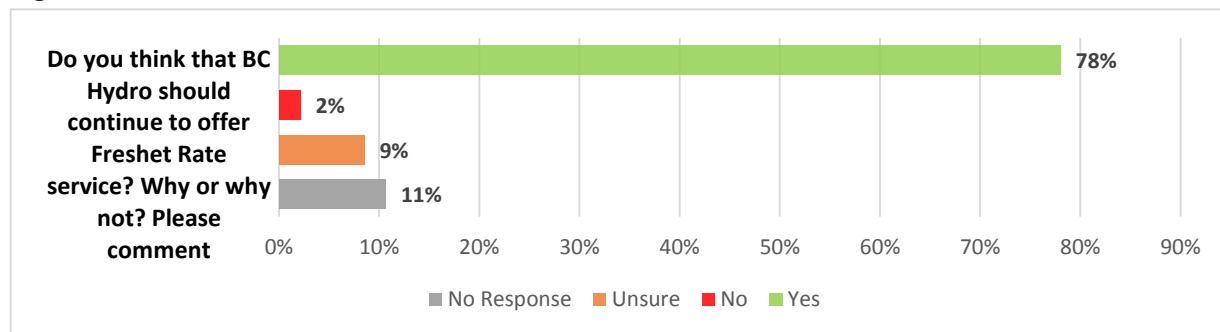


Table 2.1.1: Written Feedback

Additional comments	Location
It is good to have an option vs not but the rate differential is not enough to push the investment that it would take for us to fully participate. Customers need protection from rates above RS 1823	Kamloops
Keeps option open for future	Kamloops
To effectively utilize the surplus in the province of B.C. where possible	Kamloops
Allows for partial opportunities for any industry to take advantage of operational change that may not have been possible under normal rate circumstances	Kamloops
Good reservoir management incentive	Prince George
Mutual benefits to BC Hydro and customers while adding GDP	Prince George
It is one way to lower the cost for power	Vancouver
The Freshet Rate encourages more consumption. The 3-year pilot has demonstrated benefits to all parties.	Vancouver
There are economic benefits of the Freshet Rate	Vancouver
Win-win for BC Hydro with increased revenue and availability of low-cost power to customers	Vancouver
Calculate the rate impact on an hourly and /or daily basis instead of a monthly basis	Vancouver
The Freshet Rate supports low-carbon electrification by putting downward pressure on BC Hydro's rates due to net revenue from incremental load from Freshet Rate participants that is not shifted from load paid for at full tariff rates.	
There is a huge opportunity to create new jobs and economic opportunity in the block chain and artificial intelligence industries	Vancouver
Provide financial benefit to both BC Hydro and participants in the Freshet Rate	Vancouver
Freshet Rate is a useful option to have	Vancouver
The net benefit to rate payers seems limited	Vancouver
Use it or lose it. It makes sense, although my organization does not benefit.	Vancouver
Change the Freshet Rate to be a year-long rate	Vancouver
It's very confusing and not worth the effort just use a flat lower rate	Vancouver
Freshet Rate can encourage load growth	Vancouver
Yes	Vancouver
I think benefits of availing Freshet rates need to be well explained to bulk consumers for their appreciation and to join in	Vancouver

Additional comments	Location
Our facility has no opportunity to take advantage of the Fresh Rate service	Vancouver
We need predictable annualized EDR (Economic Development Rate)	Vancouver
The Freshet rate allows for BC Hydro to cover its costs with domestic consumption when BC Hydro has excess power	Vancouver
Any form of cost savings is invited. If it is tested and proven for the past years then why not?	Vancouver

2.2 Making Freshet Rate Permanent

Figure 2.2.1

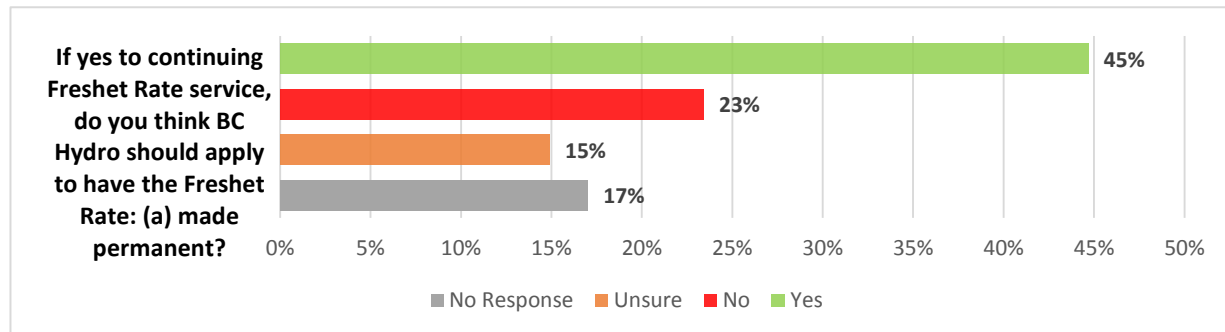


Table 2.2.1: Written Feedback

Additional comments	Location
Keep tweaking	Kamloops
Can plan future projects around capacity changes	Prince George
Either permanent or extension is fine but I would support the one that gives BC Hydro the best chance of success with BCUC	Prince George
Calculate the Freshet Rate impact on an hourly and /or daily basis instead of a monthly basis	Vancouver
The program is a win-win-win for BC Hydro, industrial customers, and other rate classes. All parties are better off than if the same power were exported.	
Yes, make Freshet Rate permanent	Vancouver
With declining industrial industry this rate is paramount to make BC businesses competitive globally. This important for both preservation and creation of BC jobs	Vancouver
Penalizes firms going for efficiency project that can lower their baseline	Vancouver
Haven't used Freshet Rate before	Vancouver
We are cautious about making the Freshet Rate permanent because of (a) uncertainty about what happens when BC Hydro has a deficit load resource balance and (b) uncertainty about the possibility of load shifting creeping in over time	Vancouver
I think long term forecasts are too uncertain (climate, US market, Alberta market) to understand a surplus situation going forward	Vancouver
If you mean permanent annual- then Yes	Vancouver
With more certainty on the longevity of the rate some load customers may choose to invest in capital that would allow them to better monetize the increased capacity at lower rates which will benefit all BC Hydro customers	Vancouver
Only once it is permanent can we start looking at investments to optimize our operations with the Freshet Rate	Vancouver
Yes BC Hydro will continue to have excess power for the years to come. The effect is that those that commit to consuming the excess, should do so at a variable or less	Vancouver

Additional comments	Location
Define permanent. With climate change we may not have a benefit of over storage or markets could react negatively (re: price)	Vancouver

Figure 2.2.2

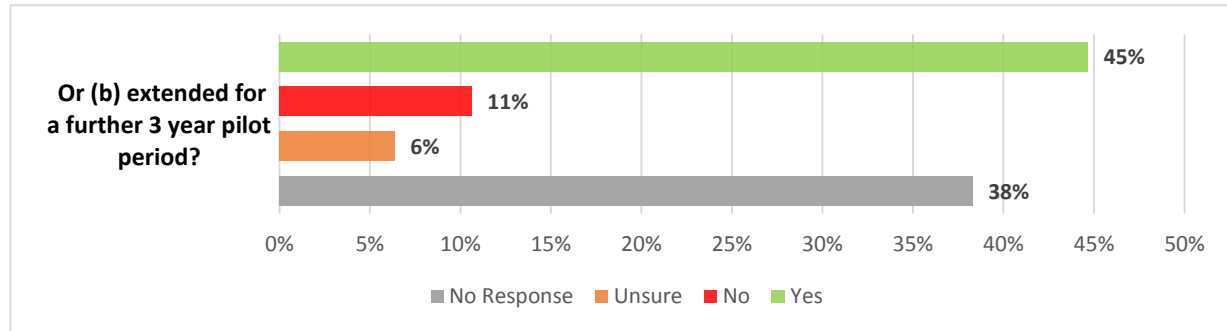


Table 2.2.2: Written Feedback

Additional comments	Location
Support extending for a further pilot if there isn't an option of a permanent rate at this time	Kamloops
BC Hydro needs to address the price risk to the customer	Kamloops
As mentioned during workshop, it is useful to mitigate risk	Kamloops
Not sure 3 years are required to test an April-June program and monthly billing	Vancouver
The Freshet Rate as a pilot is apparently working well and should be continued as a pilot	Vancouver
I would prefer this be a short-term annually assessed net benefit and rate application with the regulator	Vancouver
A further pilot would create uncertainty and potentially detract customers and BC Hydro from investing resources in managing a program that is projected to last for the duration of the current energy surplus i.e. well beyond 3 years	Vancouver
Need long-term predictable supply	Vancouver
A pilot extension lacks certainty for customers	Vancouver
If incorporated into an annual freshet period	Vancouver

2.3 Status Quo Freshet Period

Figure 2.3.1

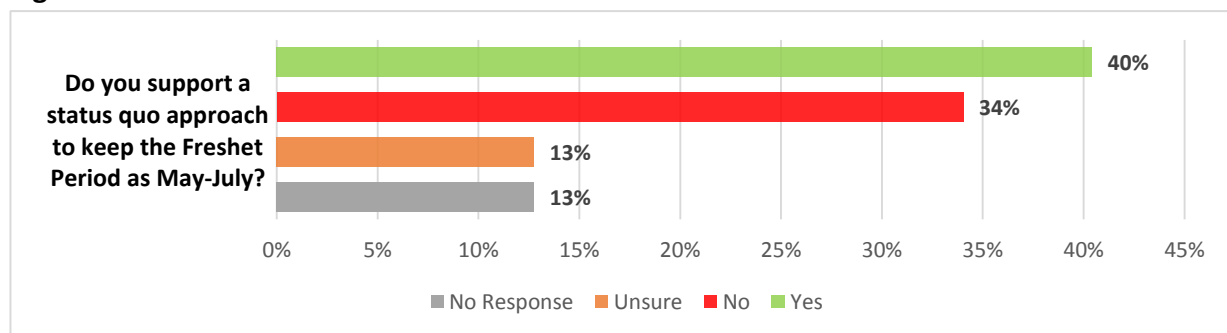


Table 2.3.1: Written Feedback

Additional comments	Location
Pricing in July has been too high; better to go April - June	Calgary
With rate protection to ensure win-win for BC Hydro and customer	Kamloops
Longer would be better	Kamloops
Would prefer to have April to June	Prince George
July Mid-C prices are too high; could pilot April-June, or just May-June	Prince George
2 Parts: 1) this would be worth extending the period; and 2) Does Freshet Rate period need to be a full month i.e. could the rate go from May 01 to July 15 and avoid the last part of July?	Vancouver
AMPC supports adjusting the period forward to avoid the July period	Vancouver
There should be a consideration to increase this period in order to attract firm power consumers	Vancouver
The Freshet Period should be determined according to the hydrology data. BC Hydro said during the workshop that the hydrology data continues to support May-July	Vancouver
Looks like the Freshet period during the pilot starts earlier than May	Vancouver
You have 3 years of proven results. No need to change	Vancouver
Perhaps the findings should be considered and the Freshet period moved back a month	Vancouver
We need an annual rate	Vancouver
Looks like the Freshet period during the pilot started earlier than May. Perhaps the findings should be considered for a Freshet period to be moved back a month	Vancouver
It does not seem to align well with price opportunity. Consider adding April to reflect lower market prices and BC Hydro is likely long during that period, especially if the energy determination is done monthly	Vancouver
Inclusion of July, with its high-risk exposure to high prices is a significant disincentive for customer participation. April-June makes more sense	Vancouver
Please change to year long	Vancouver
I support full year rate duration to large consumers	Vancouver
But this should be re-assessed as the climate changes and market peaks charge	Vancouver

2.4 Market Price Floor

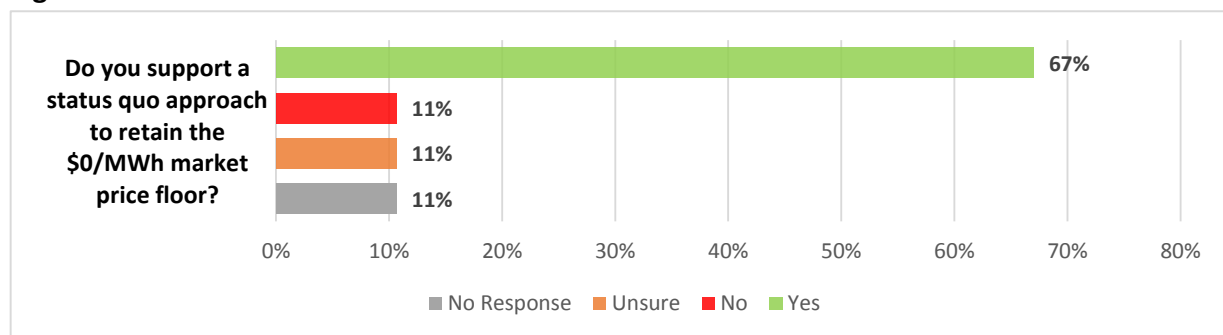
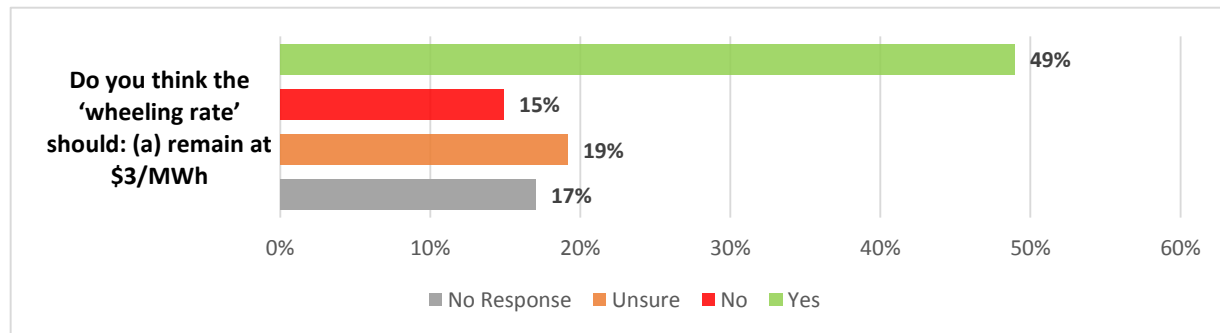
Figure 2.4.1

Table 2.4.1: Written Feedback

Additional comments	Location
If there is also a price cap at the Tariff rate	Kamloops
Allow some negative pricing to reflect value to BC Hydro to not spill or raise water flows to rivers (cost avoidance, maintenance, regularity, etc.)	Prince George
There is no limit on high prices. Therefore why limit the low prices	Prince George
If there is no cap on the ceiling, there should be no cap on the floor	Vancouver
We understand that BC Hydro recommends retaining the \$0/MWh market price floor because when the market price is negative BC Hydro can, if necessary, spill without cost.	Vancouver
AMPC recognizes that BC Hydro will spill rather than export into a negative pricing environment. Otherwise, given the wheeling fee, removing the floor would be principled and fair.	Vancouver
Having a floor at \$0/MWh while not providing an equivalent ceiling for customers, creates significant downside risk for customers. It is commercially inequitable on principle and creates a barrier for participation. The lack of a ceiling further erodes any customer incentive through the ratio mechanism where a customer effectively reduces any benefit during a period of low pricing because they need to reduce their load to protect themselves from a period of extreme pricing.	Vancouver
This will help business lower power costs on an annualized basis which will help keep BC businesses remain competitive	Vancouver
If companies take on the risk, they should get the full benefit	Vancouver
Increase the wheeling fee	Vancouver
Power should not be sold at a loss	Vancouver
Makes sense if you include a price cap	Vancouver

2.5 Wheeling Rate

Figure 2.5.1:**Table 2.5.1: Written Feedback**

Additional comments	Location
The wheeling rate should reflect actual - that's fair	Kamloops
Wheeling rate should be lower, customers and BC Hydro still better off when customers taking power, even if wheeling charge is lower	Prince George
Unless market price is below zero	Prince George
Needs to be lowered	Vancouver

Additional comments	Location
We understand that the size of the virtual wheeling rate is based on about half of the BPA wheeling charge. There doesn't appear to be any particular reason to change it.	Vancouver
I'd prefer \$0/MWh	Vancouver
Should cost \$0/MWh. There is no wheeling cost for BC Hydro	Vancouver
This should be based on actual cost of delivery based on each site	Vancouver

Figure 2.5.2:

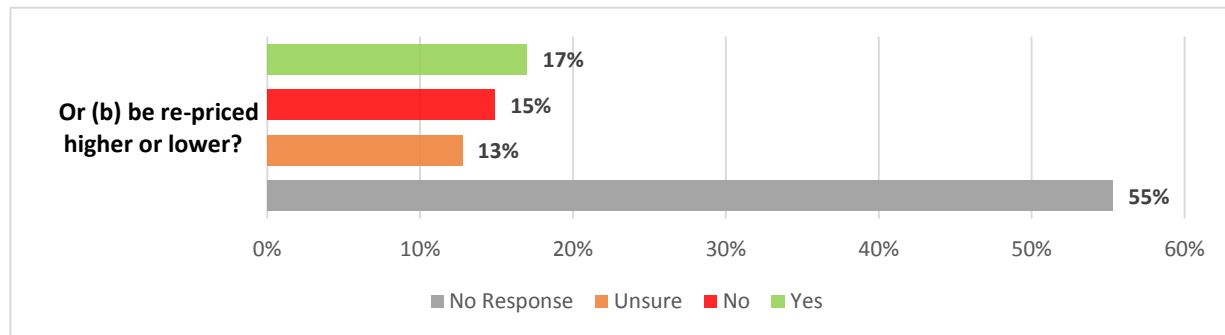


Table 2.5.2: Written Feedback

Additional comments	Location
Review. The premise of Freshet is excess water (i.e.) export of energy. Should a customer be billed wheeling fee calculated to include import of energy proportional to actual historical?	Kamloops
Low covering costs is best. Don't use this as a revenue stream	Prince George
Should be repriced lower	Prince George
Should be re-priced lower; customers and BC Hydro still better off when customers taking power, even if lower wheeling charge	Vancouver
I think considerations should be made to reduce this rate to attract new industry and jobs!	Vancouver
Price lower since it is hard to mitigate BC Hydro risks; participants don't have this insurance	Vancouver
"Higher" if the Mid-C rate stays high in future	Vancouver
To match general rate increase percentage	Vancouver
The wheeling rate should be evaluated in conjunction with a review of the floor and ceiling to provide the appropriate signal for incremental consumption	Vancouver
Should be repriced	Vancouver

2.6 Freshet Rate Pricing Settlement

Figure 2.6.1

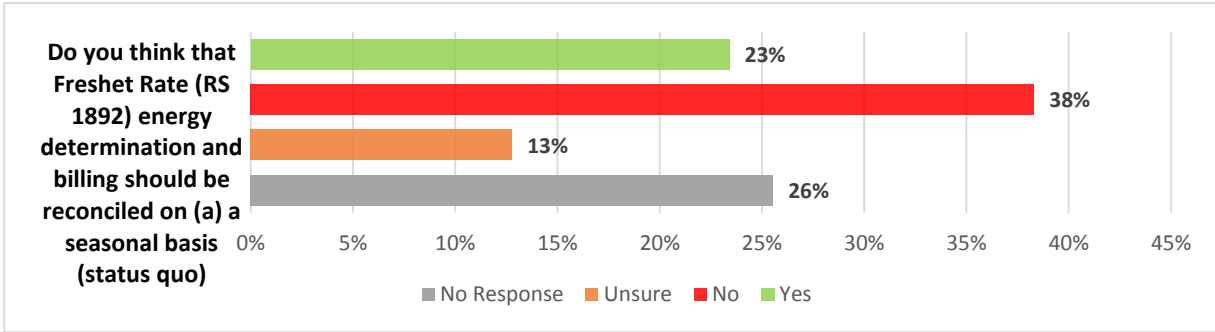


Table 2.6.1: Written Feedback

Additional comments	Location
It is easier to maintain value of change on per month basis than over a season	Kamloops
We are unsure whether monthly reconciliation would increase the possibility of load shifting.	Vancouver
This is an incredibly complex measure no other jurisdiction we operate in requires this level of complexity	Vancouver

Figure 2.6.2:

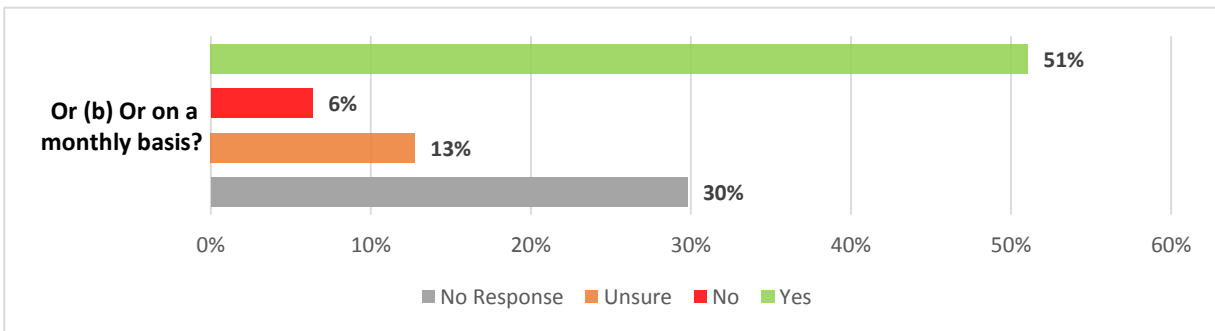


Table 2.6.2: Written Feedback

Additional comments	Location
Monthly settlement simplifies it	Prince George
Monthly settlement is simpler for financial reporting	Vancouver
We would prefer settlement on a daily basis	Vancouver
Better transparency due to ratio.	Vancouver
Monthly settlement would improve customer participation. The risk and complexity of the seasonal mechanism makes production decisions difficult to make and can retroactively destroy any benefits realized early in the season. Moreover, the mechanisms in TS 74 already provide protection against load shifting in the form of the CBL reset risk. Our company may not be able to participate in a Freshet Rate season with seasonal reconciliation given the changing climate that may present more frequent heat waves in July that has driven up the Mid-C daily pricing in every year of the pilot	Vancouver

Additional comments	Location
Seasonal reconciliation removes the incentive to make use of Freshet Rate e.g. industrial customers experience with July 'peaks'	
No need to increase the frequency of reconciliation.	Vancouver
Allow loads to optimize based on their seasonal constraints and market pricing, particularly if the season is maintained as status quo	Vancouver
Prompt billing is essential for understanding benefit to the business. Minimum monthly settlement	Vancouver

2.7 Baseline Adjustments

Figure 2.7.1:

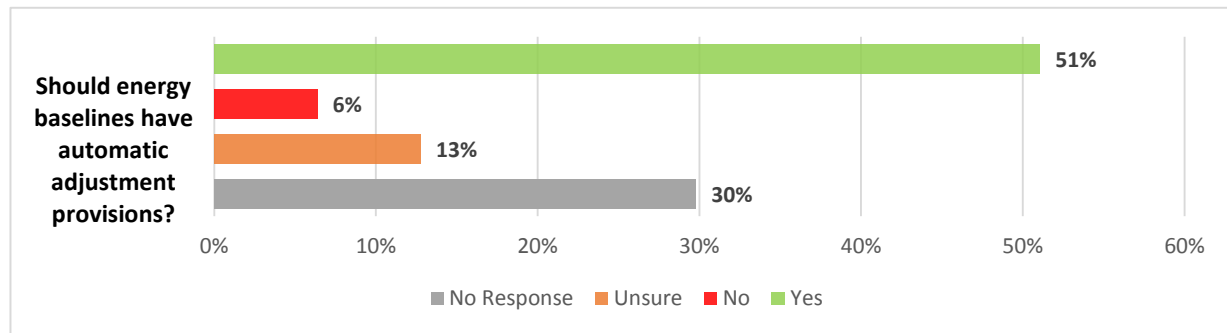


Table 2.7.1: Written Feedback

Additional comments	Location
Certain types of circumstances/events should just result in automatic adjustment	Prince George
Baselines should be adjusted similar to TS 74 and subject to BCUC approval.	Vancouver
It is likely more efficient to adopt the principles that have developed in TS 74 which includes a blend of automatic and BCUC oversight issues	Vancouver
Sometimes outages that are planned have to be shifted and that might fall into the Freshet period so a provision adjustment would make more sense	Vancouver
Based on length of time for BCUC decisions	Vancouver

Figure 2.7.2: BCUC Approval or Any Changes

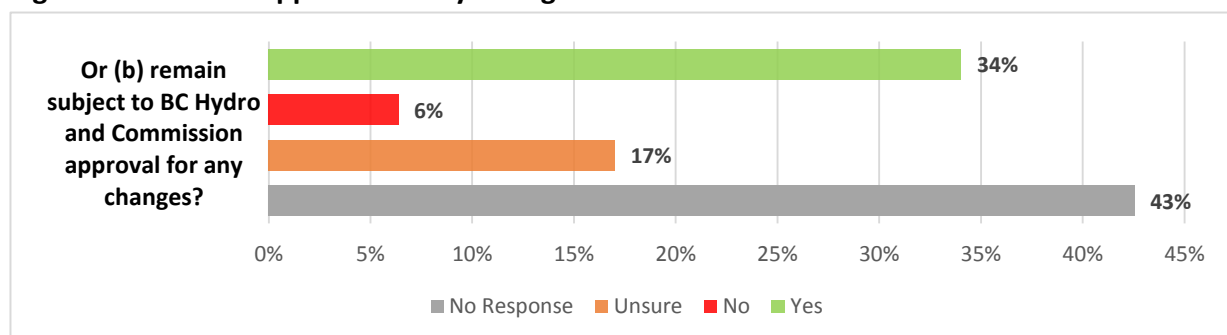


Table 2.7.2: Written Feedback

Additional comments	Location
It depends on circumstance	Prince George
It is more likely more efficient to adopt the principles that have developed in TS 74 which includes a blend of automatic and BCUC oversight issues. AMPC prefers a design that minimizes CBL fine-tuning and discussion	Vancouver
Firms should have the option to run their analysis at all times	Vancouver
For now, we would prefer to have a longer period for which potential load shifting has been evaluated before automatic baseline adjustments are implemented therefore would prefer BCUC approval	Vancouver
BCUC approval is the preferred mechanism to keep the process transparent and equitable for all customers and rate classes	Vancouver
BC Hydro needs to consider unintended load decreases (i.e. outages at facilities)	Vancouver

2.8 New Customer Baseline Determination

Figure 2.8.1

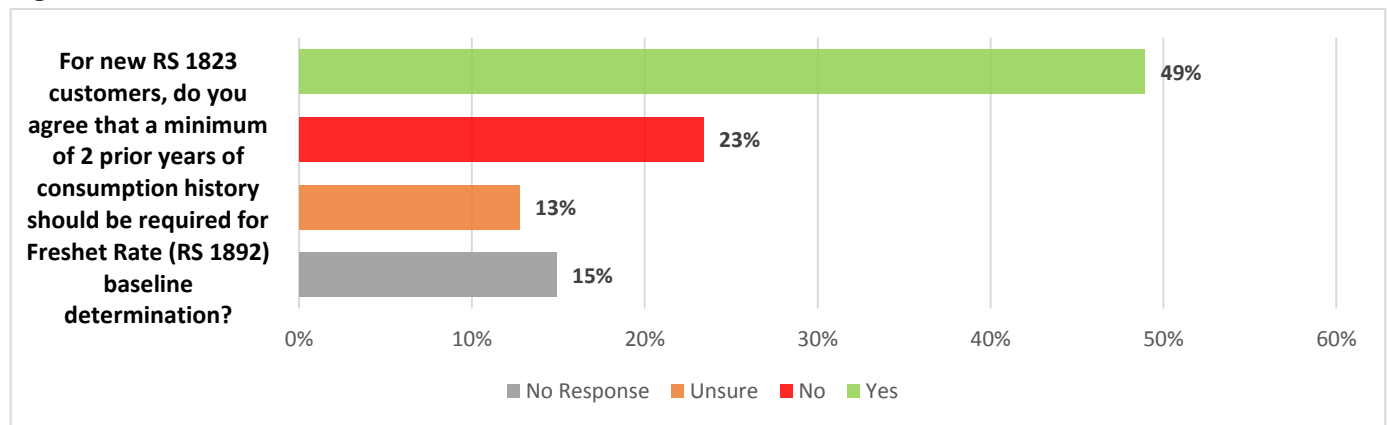


Table 2.8.1: Written Feedback

Additional comments	Location
Determination should be one-year	Calgary
Depends on individual plant, market conditions, product availability, energy supply, options may all affect operations	Kamloops
One year is acceptable	Kamloops
One year could represent an acceptable baseline. Is this dependent on the industry or type of customer?	Prince George
New startups have lower use so 2 years (using higher) is a minimum	Prince George
The pilot was for 3 years. Why not 3 prior years?	Vancouver
This will force potential clients to look elsewhere versus BC	Vancouver
It should be firm specific and based on the nature of operations and its trend	Vancouver
As we are increasing power consumption from former Mill Site ownership we would expect to be treated as significant power consumers	Vancouver
If a customer is on RS1823A that is already good for BC Hydro since that customer is paying the	Vancouver

Additional comments	Location
higher blended rate. If they already have a CBL, the reset mechanism protects against any gaming. If we are trying to encourage new load we should remove as many barriers as possible	
We understand that 2 years is a reduction from the current 3 years and that BC Hydro believes 2 years is sufficient.	Vancouver
Allow new loads to participate by using engineering estimates of what the load will be during that period. This will be particularly important if those new loads have to make capital decisions during the construction phase to take advantage of the Freshet Rate	Vancouver
I believe that if a company spends the infrastructure CapEx to support consumption above a minimum threshold, that one year baseline is acceptable to start. If consumption changes then move to a two year average to set new consumption rate	Vancouver
We should make it as easy as possible to enter	Vancouver
Not now	Vancouver

2.9 RS1892 Baseline Transfer: Site change of ownership

Figure 2.9.1

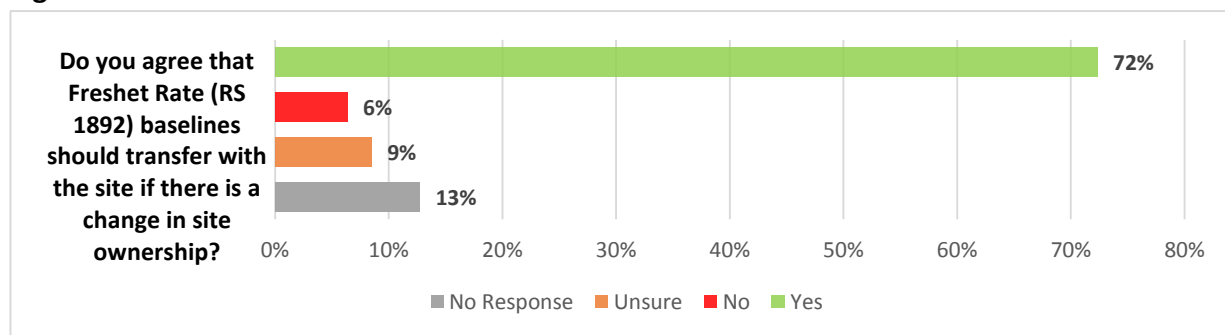


Table 2.9.1: Written Feedback

Additional comments	Location
Give option to opt out	Kamloops
How would this be assessed for new owners – 2-year baseline? Continuation?	Prince George
New owners may operate differently	Prince George
Yes to allow for baseline transfer. No to allow changes subject to BCUC approval due to changes in operating philosophy under new ownerships	Vancouver
As old industries decline, new industries should be given the opportunity to fill this demand. Cancelling this rate serves none.	Vancouver
This is reasonable, assuming there is no pro-rated billing for a change of ownership during the Freshet Period.	Vancouver
Yes, unless it can be proved that the load profile will be materially different	Vancouver
Yes the infrastructure and the consumption is in place	Vancouver
Ownership can drastically change operations	Vancouver

2.10 Site Ownership: RS 1892 Billing

Figure 2.10.1

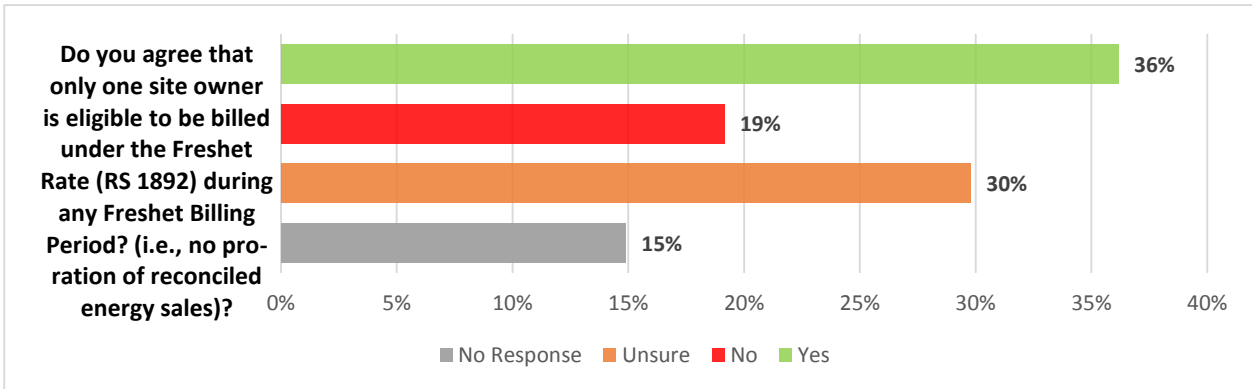


Table 2.10.1: Written Feedback

Additional comments	Location
Ownership can transfer at any time that has no impact on operation of the facility. The billing should be site dependent not ownership dependent	Prince George
I think we need to be considerate of new opportunities that can create new opportunities that can create new economic opportunities for BC	Vancouver
If the program goes to monthly reconciliation this should not be a significant issue	Vancouver
This is reasonable	Vancouver
The rate belongs to the site and site infrastructure. As long as someone on the site has ownership then they should be able to hold or proportionate out the rate	Vancouver
An opt out option should be considered for new owners	Vancouver

PART 3: Incremental Energy Rate (Annual)

Background:

Background and context for BC Hydro's 1996/7 "Real Time Pricing" (RTP) Rate was reviewed. RTP was an annual rate option available to all transmission customers. Incremental load was priced above an established baseline at market-referenced prices. RTP was terminated in 2005. There are RTP similarities with the seasonal Freshet rate. The Freshet rate design overlays non-firm service with firm RS 1823 service. Given the success of the Freshet rate, participants advised their support for a similar rate to be offered over a full year. The proposed new optional "Incremental Energy Rate" would be for non-firm, interruptible service using market reference-priced energy (Mid-C) to encourage incremental domestic electricity use from RS 1823 customers.

Key Topics for Review and Discussion:

Rate design principles and a "strawman" rate design proposal were presented. Key elements of the proposed Incremental Energy Rate design include:

- ❖ Annual option for non-firm, incremental market reference-priced electricity
- ❖ Market reference price for energy is ICE Index - Day ahead Mid-C for On-Peak (HLH) and Off-Peak (LLH) above Monthly Energy Baselines
- ❖ No demand charge for load above Monthly Reference Demand
- ❖ Rate would be available to new and existing RS1823 Transmission customers with a 5MW minimum ESA contract demand
- ❖ Energy Baselines (HLH & LLH) and a Reference Demand to be determined by calendar month using the most recent 365 days of historical RS1823 electricity use (F2018 is default);
- ❖ \$/MWh monthly adder with seasonal adjustment as proxy for transmission wheeling;
- ❖ No dual participation in Freshet Rate and Incremental Energy Rate.

Feedback Themes

- There was clear support (66% in favour) for the rate design principles and proposed "Strawman" rate design criteria.
- There was support for the annual market-referenced price rate option to provide a non-firm service option for incremental electricity use with monthly settlement.

Summary of Participant Feedback:

3.1 Market-Referenced Price Rate (Annual)

Figure 3.1.1

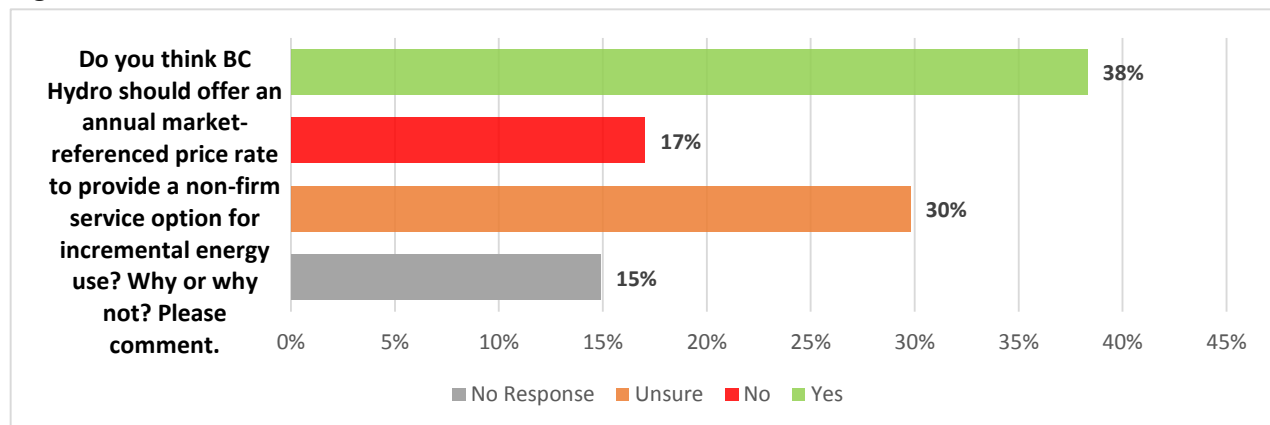


Table 3.1.1: Written Feedback

Additional comments	Location
Not sure how many customers can take advantage of this proposed rate	Kamloops
To utilize BC Hydro's surplus within the province where possible	Kamloops
Helps attracts value for excess system capacity/supply	Prince George
Some customers may be able to access infrastructure while others may not. Does this create unfair competitive advantages?	Prince George
YES: Propose a 3 year trial	Prince George
Having this option may provide additional incentives to use more power	Prince George
Need to review proposed rate based on our usage. But it is objective and flexible so YES	Prince George
Industrial consumers are handcuffed by two tier rates. No one can afford Tier 2. So we are limited in output to avoid high cost power. Mutual benefit to customers	Prince George
BC Hydro RS1823 prices are too high so we need options to lower the cost	Vancouver
The success of Freshet Rate and the nature of the market lends itself to extending the program year round	Vancouver
We have incremental capacity year-round	Vancouver
Really seems over complication is a mandate on these rates	Vancouver
This should be the lowest price of power	Vancouver
More choice is always good	Vancouver
BC Hydro's intent is to encourage higher energy consumption and to retain and attract customers	Vancouver
In principle, an annual market-referenced TSR rate for non-firm incremental service offers support for low carbon electrification on both the load side and the BC Hydro revenue side. We note that "incremental" means no shifting of load from the regular tariff.	Vancouver
Market-referenced price rate encourages greater consumption of electricity beyond the Freshet Rate; and during high cost hours or tight supply, customers would drop load to conserve electricity, making more electricity available to serve firm loads. It's beneficial to customers, BC Hydro and all other rate payers	Vancouver

Additional comments	Location
Capital additions made to capitalize on the Freshet Rate can likely continue to deliver value during the rest of the year	Vancouver
I think market rates need to be independent of RS 1823 Tier 2 rates. There should be rate specific consideration if we want to move to interruptible, free-market style rates.	Vancouver
For new customers who have the ability to curtail for competitiveness.	Vancouver
Provides higher value to BC Hydro and therefore a benefit to customers	Vancouver
Currently participating in Freshet Rate pilot to gain advantage of market-referenced price for incremental energy use	Vancouver
This rate may encourage customers to increase their productivity when they might have otherwise not. Also, the Freshet Pilot has shown that the market has opportunities throughout the year, outside of the traditional Freshet period. Moreover, many industries have seasonal fluctuations in markets and supply pricing which may create incentives to consume more energy outside of Freshet	Vancouver
Having this option may provide additional incentive to use more power	Vancouver
This would allow for inexpensive power on interruptible basis	Vancouver
This should be the lowest price of power	Vancouver
For our facility that I access would most likely have to be firm. If we increase so unsure where we would be able to use this rate	Kamloops

3.2 Proposed Rate Design and Pricing Principles

Figure 3.2.1

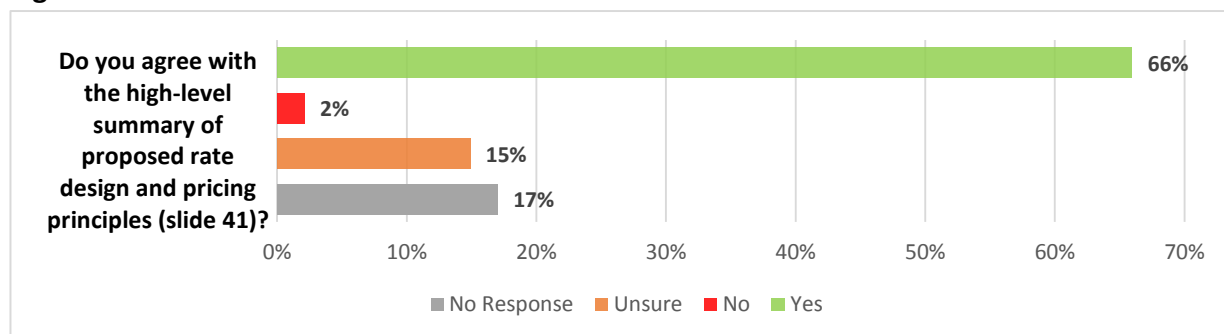


Table 3.2.1: Written Feedback

Additional comments	Location
Yes just don't use financial instruments to control. Very bad	Prince George
If BC Hydro provides market pricing when it is available. Long term pricing encourages customer use market price. ie will install capacity if price is lowest long-term	Prince George
Really seems over complication is a mandate on these rates	Vancouver
Seems reasonable but would need to think more on impact to business.	Vancouver
We support the principles set out on the slide titled "Proposed principles for annual market-reference priced rate." We would also favour incorporation of some mechanism to explicitly bolster low-carbon electrification in terms of the incremental load.	Vancouver
As always we are trying to have lowest cost service	Vancouver
<ol style="list-style-type: none"> 1. Make use of the surplus other than the Freshet period 2. Customers have more options to choose from. 	Vancouver

3.3 ‘Strawman’ Rate Design Proposal

Figure 3.3.1

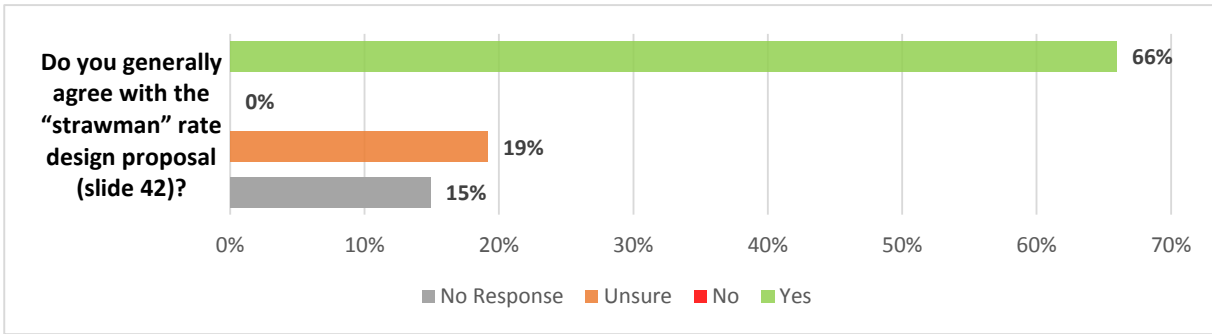


Table 3.3.1: Written Feedback

Additional comments	Location
Fundamentally makes sense, should be usable. Need a trend or pilot	Prince George
Interruption due to supply reasons not long term economic, although unlikely scenario	Prince George
Really seems over complication is a mandate on these rates	Vancouver
This rate should be filed for Commission approval together with the non-firm permanent Freshet Rate. It can be on a 3-year pilot basis similar to the introduction of Freshet Rate.	Vancouver
Need lower minimum ESA to entry while we quickly ramp to high consumption levels	Vancouver
5MW minimum ESA is too high	Vancouver
The “Risk Adjustment Factor” should reflect the whether there is a price ceiling and the benefit to the utility for incremental demand to incentivize participation. If there is additional administration cost for running the program this may be better dealt with through a fixed participation fee and a smaller “Risk Adjustment Factor”	Vancouver
We generally agree with the strawman criteria. We understand that BC Hydro is thinking of a three-year pilot project. That makes sense.	Vancouver
Generally as a trial	Vancouver

3.4 Rate Concept

Figure 3.4.1

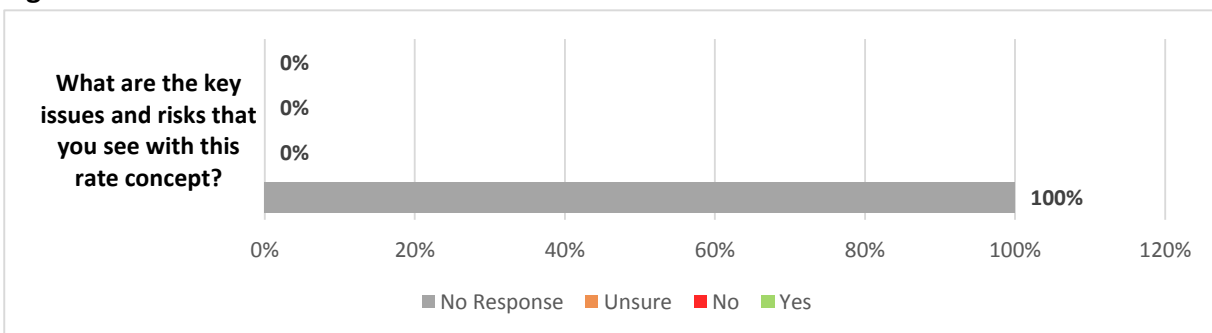


Table 3.4.1: Written Feedback

Additional comments	Location
I worry that it be lot of additional red tape to keep the baseline current	Calgary
Not sure if we can benefit	Kamloops
Not sure if our plant would qualify (need to show ESA contract)	Kamloops
Under utilization	Kamloops
Likely only to attract existing idle capital as new capital would require rate certainty	Kamloops
I worry that it will be a lot of additional bureaucracy to keep the baselines current	Kamloops
Offer as pilot so we can see how it goes	Prince George
This should be brought in as a pilot program in conjunction with the Freshet Rate proposal for evaluation of impacts to cost structure	Prince George
Length of time for notice of interruption; pilot may require something more permanent for additional capital investment	Prince George
Offer was a pilot so we can see how it goes	Prince George
BC Hydro needs a mandate for economic development	Prince George
Price uncertainty over the whole year	Vancouver
High market rates for lengthy period would cause company to opt-out	Vancouver
The Freshet Rate has demonstrated a win-win-win nature of the proposal. Setting and communicating the reference clearly will be important, as well as being nimble in responding to unanticipated outcomes, analogous to the combination of July peaks and seasonal reconciliation in the Freshet pilot. Interaction with RS 1823 will need to be carefully considered.	
Customers should only be able to elect services on either Freshet or Market-referenced price rate (i.e. not both). When filed together with the permanent Freshet Rate, BC Hydro can gain sales on latent loads that otherwise would not have been consumed under the Tier 2 energy rate. Customers who are on either of the rates are exposed to price risks but can better manage their energy costs on the incremental usages.	Vancouver
The potential negative impact on RS 1823 CBL could easily result in less customers buying into this rate (or even dropping off it)	Vancouver
It will be challenging to ensure compliance with the “incremental” principle. Particularly with customers who are in growth mode. A longer term issue to address is what will happen when BC Hydro faces a deficit load resource balance.	Vancouver
Exposure to risk of energy price increase for the incremental demand increase	Vancouver
Market price exceeding RS 1823 rate regularly	Vancouver
Moving to a market approach while keeping many of the risks (long term asset development) with the rate payers	Vancouver
Market-reference rate (annual) is the most needed rate after Freshet Rate which would benefit BC Hydro rate payers' year around. I urge BC Hydro to proceed with this rate and forward to BCUC ASAP so that it can come into effect for April 2019.	Vancouver
Not sure: only concern is that no negative impact to provincial rate payers	Vancouver
Again, opportunity for higher value sales for BC Hydro and therefore value to all BC Hydro customers	Vancouver
We are asking for an annualized Economic Development Rate	Vancouver
That the rate will not last long enough to attract load	Vancouver
Coordination of annual CBL baselines with this program's annual baseline may create issues, particularly with a large event that could trigger a CBL debit/credit in a month. We need to be careful on how these 2 concepts are coordinated. We should also ensure that there is a “buy back” mechanism for customers who wish to transfer some purchases back to RS1823 in the	Vancouver

Additional comments	Location
event of a reset risk. This buy back provision should be presented upfront and reflect an upfront allocation of costs, so all customers realize the participation risks and avoid any anxiety in March.	
Define/cap interruptability so that loads can understand what utilization they can rely on for the incremental energy and provide certainty that capital spent to achieve that utilization will be returned	Vancouver
If an investment was made assuming lower prices for electricity if price increased the customer would absorb losses	Kamloops

February 05, 2019



ENGAGEMENT SUMMARY REPORT

TRANSMISSION SERVICE RATES COMMENTS AND FEEDBACK

**From November 19, 2018
Transmission Service
Rate Design Workshop**

NOTE: This report only contains feedback related to BC Hydro's proposal for a permanent Freshet Rate and Incremental Energy Rate Pilot and is provided in support of BC Hydro's Market Reference-priced Rate Application.

Transmission Service Rates www.bchydro.com

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INTRODUCTION

BACKGROUND

BC Hydro conducted four transmission rate design workshops (Workshops) in October 2018; a follow-up workshop was held on November 19, 2018. Invitations were extended to existing transmission service customers, prospective new customers, registered interveners and interested parties. The purpose of the November 19th workshop was to provide participants with a recap of the four October 2018 Workshops and to further review the proposed rate design principles and eligibility criteria.

REPORT STRUCTURE

This report provides: (a) an overview of BC Hydro's engagement process; (b) a consolidated summary of comments and feedback received; and (c) reporting of survey results from written feedback. Written feedback was provided to BC Hydro via a written Feedback Form. Verbal feedback was provided to BC Hydro in the Workshops and captured in minutes which BC Hydro has termed "Summary Notes". For this purpose of this engagement report only customer responses for Part 1: Market Reference-priced Rates (Freshet Rate + Incremental Energy Rate) are summarized:

- ❖ **Part 1: Market Reference-priced Rates (Freshet Rate + Incremental Energy Rate)**
- ~~❖ **Part 2: Load Attraction Rate**~~
- ~~❖ **Part 3: Load Retention Rate**~~

The write-up for each category includes a background description of the proposed rate design, key topics presented for review and discussion, feedback themes and a summary of participant's survey responses and written feedback. Copies of the presentation slides used in the Workshop, the Feedback Form, and Summary Notes for each Workshop are located at:

https://www.bchydro.com/toolbar/about/planning_regulatory/regulatory.html

TSR WORKSHOP

The November 19, 2018 Workshop was presented by BC Hydro staff from Customer Service and Regulatory and held at the BC Utilities Commission Hearing Room. The Workshop session was 3.25 hours in length, starting at 8:45am and ending at 12:00pm. Summary details are provided below:

- ❖ Invitations were extended to existing transmission service customers, prospective new customers, registered interveners and interested parties who had attended any one of the four Workshops held in October 2018.
- ❖ Invitations were sent via email by BC Hydro staff approximately 1 week prior to the date of the Workshop. Follow-up email invitation reminders were sent leading up to the start of the Workshop.

- ❖ Various BC Hydro Key Account Managers and support staff attended the November Workshop with customers from their account portfolios. BC Hydro staff are not included in attendee numbers.
- ❖ The November Workshop included a webcast service for participants unable to attend in person.

Number of Workshop Attendees:

WORKSHOP LOCATION	NO. OF ATTENDEES	Feedback Forms Received
Vancouver (In-person)	25	12
Vancouver (Webcast)	30	0
TOTAL	55	12

ENGAGEMENT PROCESS

The November Workshop provided a recap of the October Workshops and reviewed in greater detail the following transmission service rates:

- (1) Market reference-priced rates: RS 1892 Freshet Rate and Incremental Energy Rate;
- (2) Load Attraction Rate; and
- (3) Load Retention Rate.

The summary below describes how written and verbal feedback was collected and reported.

Written Feedback

Written feedback was collected by BC Hydro using a Feedback Form distributed to the attendees at the Workshop. Written feedback was provided in two ways: (1) a check-box to record customer opinions/preferences for each scope item identified by BC Hydro; and (2) sections provided for additional comments. Written comments have been consolidated, grouped by scope item, and reported in feedback summary tables as set out below.

Verbal Feedback:

Detailed minutes were kept of attendee questions/comments and BC Hydro's response. Workshop minutes (Summary Notes) are available at:

https://www.bchydro.com/toolbar/about/planning_regulatory/regulatory.html

PART 1: Market Reference-priced Rates - RS 1892 Freshet Rate Pilot and Incremental Energy Rate

Background:

BC Hydro has a forecast system energy surplus. BC Hydro seeks to encourage incremental electricity usage by its large industrial customers by offering market-based prices through an existing Freshet Rate (RS 1892 from May to July) and/or proposed annual Incremental Energy Rate (RS 1893). Service under these rates would be on a non-firm, interruptible basis and would apply to incremental electricity consumption only.

Key Topics for Review and Discussion:

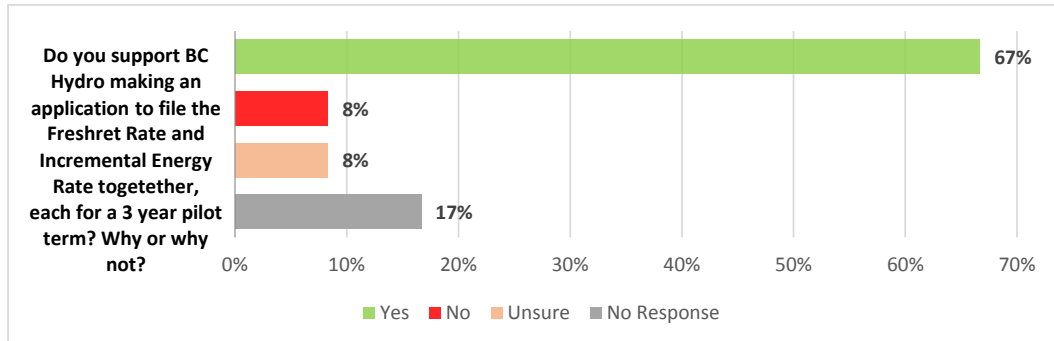
- ❖ Recap of BC Hydro's strategic focus, TSR (Transmission Rate Service) tool box and rates guiding principles.
- ❖ Summary of participant feedback (verbal and written) received from the four October 2018 Workshops.
- ❖ Overview of Market Reference-Priced Rates – existing Freshet Rate and proposed Incremental Energy Rate, including:
 - Detailed rate design elements
 - BC Hydro's proposed regulatory filing schedule to the BCUC.

Feedback Themes:

- There was clear support (67% in favour as per Figure 1 in section 1.1 below) to file an application for the Freshet Rate and Incremental Energy Rate on a 3 year pilot basis.
- Feedback specific to the timing of the Freshet Period and the impact of high market price volatility in July was received.
- Proposed Incremental Energy Rate service interruption and/or suspension received mixed support with customers seeking greater clarity on potential for such events to occur.

1.1 Filing Approach for RS 1892 Freshet Rate and Incremental Energy Rate

Figure 1

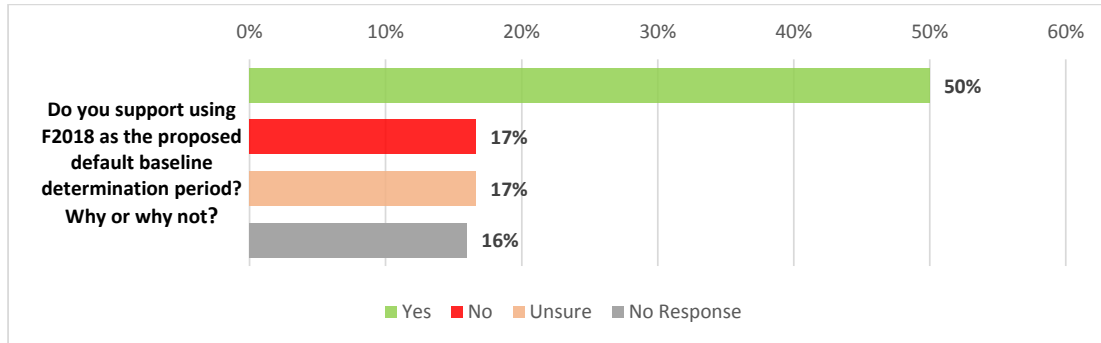


Written Feedback

Additional comments
Need programs to average costs; consider a 2-month Freshet Pilot (May and June) and if kept at 3-months consider a higher cap at Tier 1 price.
This allows more rate options for customers to choose while providing additional mutual benefits to BC Hydro, the customer, and other rate payers.
As we commented at the workshop, the Freshet Rate is an awful lot of process for a very small program return.
CAPP members cannot leverage the benefits of the Freshet Rate and a proposed Incremental Energy Rate; accordingly CAPP has no position on either of these rates. Proposed Incremental Rate would help with economic development and would not risk established customers.
Would much prefer a permanent rate rather than renewing for 3-year terms. Capital invested/employment requires a longer horizon than just three (3) years.
These are two different programs and one is an unknown commodity so they should be filed separately, especially because the proposed Incremental Energy rate could be more controversial.
The Freshet Rate based on incremental use over the May-July period does not make a lot of sense. It certainly diminishes the benefit for both BCH and customers. BC Hydro is focused on hydrology when it should be focused on the marginal cost /market value of energy. The incremental rate with monthly settlements is better in this respect, though daily HLH and LLH periods would be even better at least for customers sophisticated enough to manage their energy requirements in response to daily changes in market conditions.

1.2 Incremental Energy Rate Baseline Determination Period

Figure 2

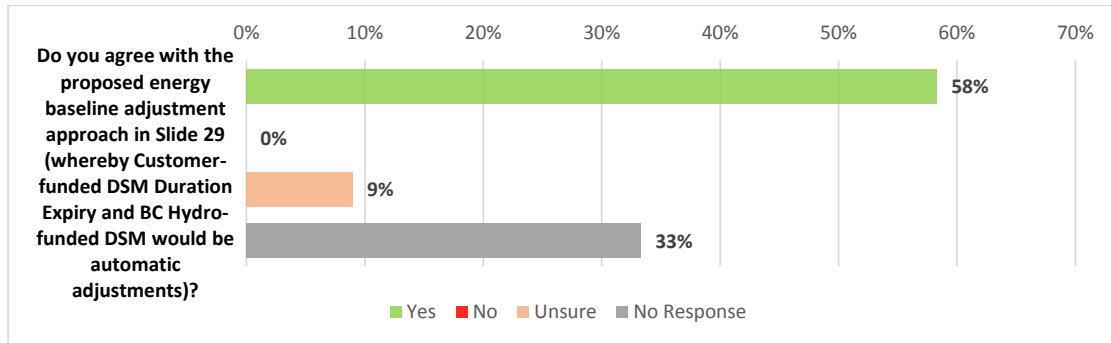


Written Feedback

Additional comments
Probably most representative for most cases; needs to allow for special cases based on requests.
Should be based on the latest/most recent data.
How about the average of F16 to F18 to match up with the Freshet Rate pilot period? This avoids saddling companies who operated well in one year with high baselines and over exposing companies who operated poorly with low baselines.
The conditions of access to the proposed Incremental Rate and the opt-out at any time seem problematic. This is a rate that should be available to all loads (not just existing) with much stricter opt-out provisions. A market-based rate could be a better way to attract new loads than the proposed Load Attraction rate, recognizing that customers can in fact hedge market risk through financial contracts for differences (with traders). The key to protect BCH customers is not to allow these customers to opt out (and jump to the regulated rate) when convenient. They would then impose long run obligations and costs on everyone else. The economic analysis of the incremental rate that BC Hydro presented was very weak. The key question — what is the marginal cost of supply — was basically just addressed with an assumption. The whole discussion of baseline adjustments seemed very complex and bureaucratic (and subject to abuse). It would be great to simplify what is incremental or separate from RS 1823 service. And what might help that is moving away from the two-tiered RS 1823 structure, particularly since there is no justification for the current level of the second tier rate at this time (given the surplus and given the falling LRMC of supply).
Has to be a historical base-line or it can be gamed.
We will not offer comment without the assistance of our expert consultant and with the full application's information.
As it may or may not be indicative of what the real consumption should be, each customer should be able to select a representative year (within the last three) that reflects baseline (business fluctuations).

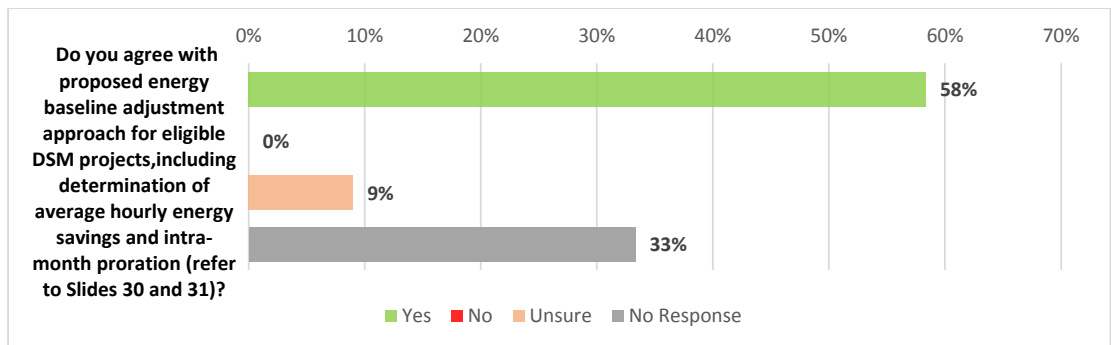
1.3 Baseline Adjustment Considerations

Figure 3



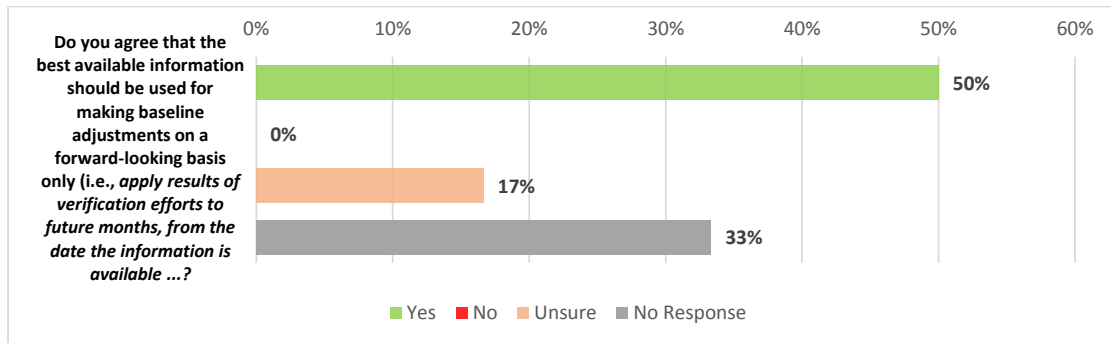
1.4 Energy Baseline Adjustment Criteria – DSM Projects

Figure 4



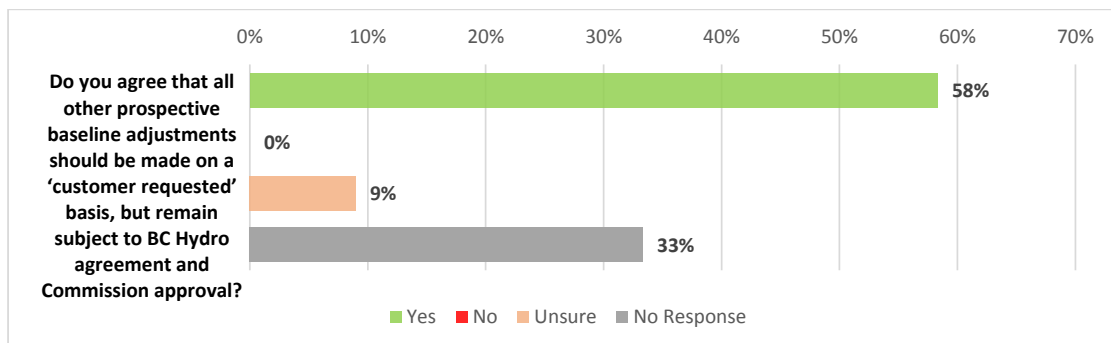
1.5 Timing of Baseline Adjustments

Figure 5



1.6 Baseline Adjustment Approach

Figure 6

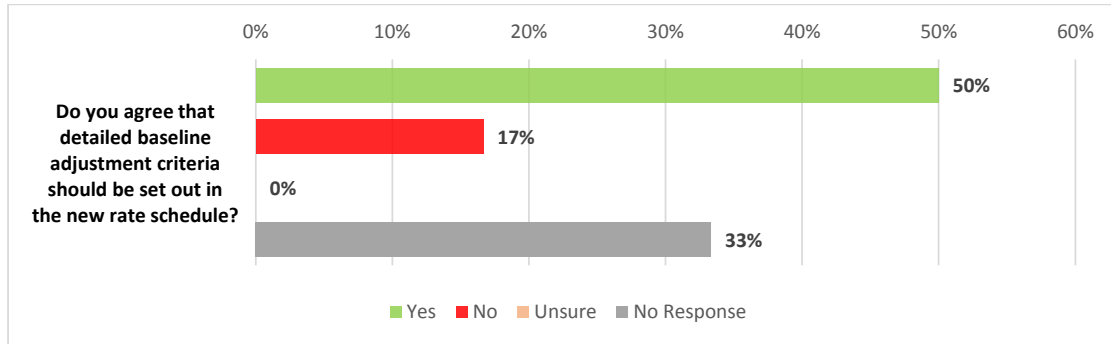


Written Feedback

Additional comments
Consistent with current CBL adjustments

1.7 Baseline Adjustment Criteria

Figure 7

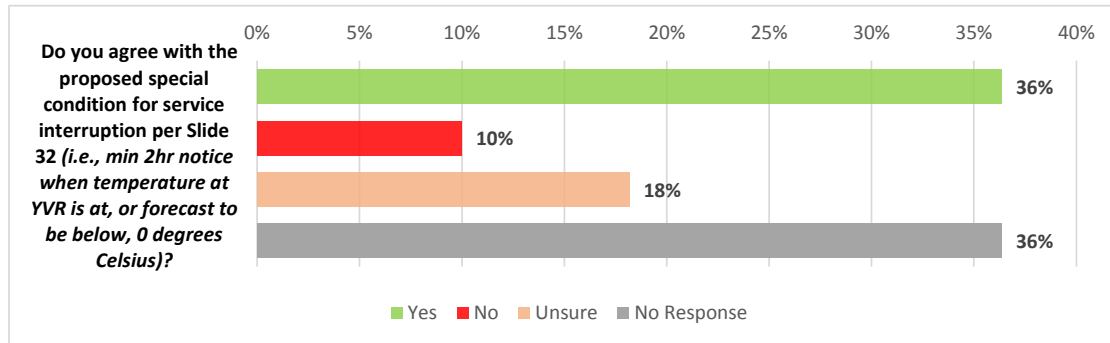


Written Feedback

Additional Comments
Refer to TS (Transmission Schedule) 74
TS (Transmission Schedule) 74 provides sufficient details on baseline adjustment criteria, no need to repeat or be over-subscribed in the new rate schedule

1.8 Proposed Service Interruption Criteria

Figure 8

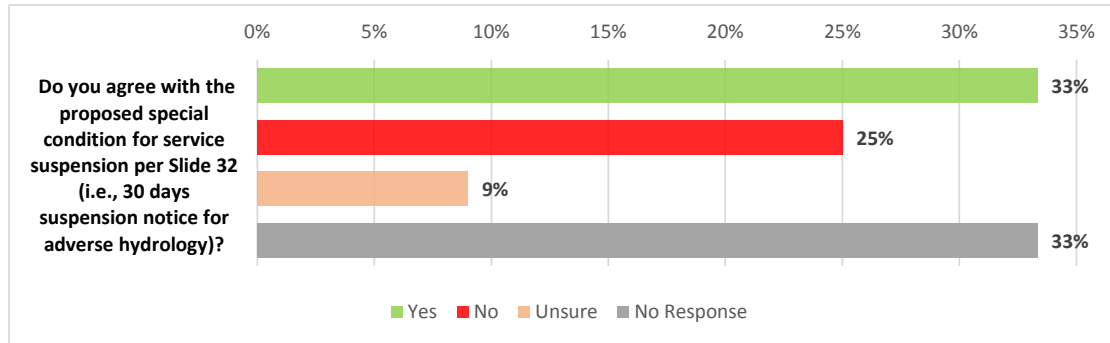


Written Feedback

Additional Comments
Longer notice should result in small credit
Agree - makes sense
Only for the non-firm portion
Curious to know how many times in the past 10 years has the service been interrupted to industrial customers
Services should only be interrupted by emergency adverse system conditions
Loads would naturally be self-interrupted by high price signals.
Advance notice with clear rules; make this simpler
We would be interested to know how BC Hydro chose this temperature as the trigger for a potential interruption. Studies? Other jurisdictions? Its own predictions?
I believe that the notice period can be in advance of 2 hours. Some operations are 24/7 and with only a two hour notice, then there could be a significant business interruption or loss of product, it product needs to be dumped

1.9 Proposed Service Suspension Criteria

Figure 9



Written Feedback

Additional Comments
Should adjust price and let customer decide to whether to run or not-run their operations
Only for the non-firm portion of energy
As long as BC Hydro has the ability to trade or import/export energy, adverse hydrology should not affect this rate.
Yes but the consequences should not be punitive with respect to pricing; Tier 2 consequences would be unfair
Does BC Hydro expect that 30 days would provide it with enough time to deal with "adverse hydrology"? At what point would conditions qualify as "adverse"
Currently BC Hydro is looking to the consumer to be a cost plus payer. BC Hydro does not currently provide the consumer a financial safety net if there is a disruption of service. BC Hydro should have safeguards in place to provide power even if there is a hydrology issue.

October 22, 2019



ENGAGEMENT SUMMARY REPORT

TRANSMISSION SERVICE RATES COMMENTS AND FEEDBACK

**From September 2019
Transmission Service
Rate Design Workshops**

NOTE: This report only contains feedback related to BC Hydro's proposal for a permanent Freshet Rate and Incremental Energy Rate Pilot and is provided in support of BC Hydro's Market Reference-priced Rate Application.

Transmission Service Rates www.bchydro.com

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INTRODUCTION

BACKGROUND

BC Hydro conducted four Transmission Rate Design Workshops (Workshops) in September 2019. Invitations were extended to existing and prospective new transmission service customers and industrial intervener groups only (Association of Major Power Customers, Mining Association of BC and Canadian Association of Petroleum Producers). The purpose of the workshops was to; (i) provide an update on BC Hydro's general rate increase request to the BC Utilities Commission; (ii) provide information and seek feedback on BC Hydro's proposed non-firm rate designs – which comprise a permanent Freshet Rate and pilot Incremental Energy Rate; (iii) provide information and seek feedback on BC Hydro's proposed amendments to Tariff Supplement 74; and (iv) provide information on certain business practices and processes related to BC Hydro's portfolio of transmission rates and tariffs.

REPORT STRUCTURE

This report provides: (a) an overview of BC Hydro's engagement process; (b) reporting of results to polling questions provided during the workshops; and (c) a consolidated summary of written feedback provided via feedback form. Real time polling was conducted during each workshop using the web-enabled solution "Poll Everywhere". Participants used their handheld devices to respond to each polling question. Written feedback was provided to BC Hydro via a feedback form. Verbal feedback provided to BC Hydro in the Workshops is captured separately in minutes for each session and is not included in this report. Survey results and written feedback are summarized in this report for each of the five categories as set out below:

Note: This report has been modified to include only customer feedback (i.e., polling question responses and written feedback) related to BC Hydro's proposed Market Reference-priced rates - permanent Freshet Rate and pilot Incremental Energy Rate.

- ❖ ~~Part 1: General Rates Update and Rate Design Refresher~~
- ❖ **Part 2: Freshet Rate – Proposal for Permanent Rate**
- ❖ **Part 3: Incremental Energy Rate – Proposal for Pilot Rate**
- ❖ ~~Part 4: Proposed Amendments to Tariff Supplement 74 (TS 74)~~
- ❖ **Part 5: Additional Comments**

The write-up for each category includes a short introduction to provide background and context specific to that category. It highlights the key topics presented for review and discussion. It presents the overarching feedback themes which reflect the participant polling responses and written feedback.

TSR WORKSHOPS: OVERVIEW

The September 2019 Workshops were presented by BC Hydro's Transmission Rates and Large Customer Rate Operations team. The Workshop session was 3.5 hours in length, starting at 8:30am and ending at 12:00pm. Summary details are provided below:

- ❖ Invitations were extended to existing and prospective transmission service customers
- ❖ Invitations were sent via email approximately 2-4 weeks prior to the date of the Workshops
- ❖ Follow-up email invitation reminders were sent leading up to the start of the Workshop
- ❖ Customers were eligible to attend the workshop location of their choice
- ❖ There was no charge to attend
- ❖ Approximately 102 attendees registered to attend one of the four workshops
- ❖ BC Hydro staff who attended are not included in attendee numbers

Table 1: Workshop Locations and Number of Attendees

WORKSHOP LOCATION	DATE	NO. OF ATTENDEES	Feedback Forms Received
Prince George	September 16, 2019	19	19
Vancouver	September 17, 2019	45	13
Kamloops	September 18, 2019	9	7
Calgary	September 19, 2019	21	10
TOTAL		94	49

ENGAGEMENT PROCESS

The September Workshops provided information on the following subject areas:

1. General Rates Update (BC Hydro's F2020/21 Revenue Requirements Application)
2. Freshet Rate – Proposal for Permanent Rate
3. Incremental Energy Rate – Proposal for Pilot Rate
4. Indirect Service/Resale Supply Options and TSR Business Practices
5. Proposed Amendments to Tariff Supplement 74 (TS 74)

The summary below describes how polling response and written feedback were collected and reported.

Polling Feedback

Polling feedback was obtained in real time at each workshop. Instructions were provided and attendees participated by visiting a customized website (pollev.com/bch732) from their handheld devices. Polling questions appeared and attendees responded by tapping a response from their mobile device. Responses were anonymous. For each poll question, BC Hydro has recorded and reported the number of total responses. Responses are charted and provided in this report on an overall basis and by specific workshop location.

Written Feedback

Written feedback was collected by BC Hydro using a Feedback Form distributed to the attendees at the Workshop. Written feedback was provided in two ways: (1) a check-box to record customer opinions/preferences for each scope item identified by BC Hydro; and (2) sections provided for additional comments. Written comments have been consolidated, grouped by scope item, and reported in the feedback summary tables set out below.

PART 2: Freshet Rate – Proposal for Permanent Rate

Background:

BC Hydro proposes that a permanent Freshet Rate be filed by October 31, 2019 as per Commission Order G-109-19 under substantially the same terms and conditions as the pilot, with minor changes of an administrative nature only. An overview of the Freshet Rate design concept and Year 4 results were presented. Attendees were polled on their support for a permanent Freshet Rate that will maintain the ‘status quo’ (same design, pricing and terms) and incorporate minor housekeeping amendments and new provisions that BC Hydro considers are of an administrative nature only.

Key Topics for Review and Discussion:

- ❖ Freshet Rate Design Overview
- ❖ Year 4 Results: Mid-C Pricing, Participation, Load, and Rate Impact
- ❖ Proposed Freshet Rate Amendments: Housekeeping and New Provisions

Feedback Themes

- There was strong support (89% overall in favour, per Figure 1) for an optional permanent Freshet Rate to be filed with the BCUC
- There was reasonable support (62% overall in favour, per Figure 2) to maintain the ‘status quo’ of the Freshet Rate Design.
- In general, concerns raised by customers in relation to the Freshet Rate design are specific to the freshet period used and seasonal vs monthly billing settlement. BC Hydro notes that it has incorporated this feedback into the design of the Incremental Energy Rate Pilot, rather than make changes to the Freshet Rate design.
- For respondents who voted “unsure” to Freshet Rate questions, including prospective new customers not yet taking service, BC Hydro sought feedback to confirm that this response generally reflected a lack of experience and/or familiarity with the Freshet Rate.
- There was strong support (90% overall in favour, per Figure 3) for the housekeeping and new provisions proposed by BC Hydro. These changes are designed to provide clarity for customers and to address minor administrative matters.

Figure 1: Freshet Rate - Support for Permanent Rate (75 total respondents)

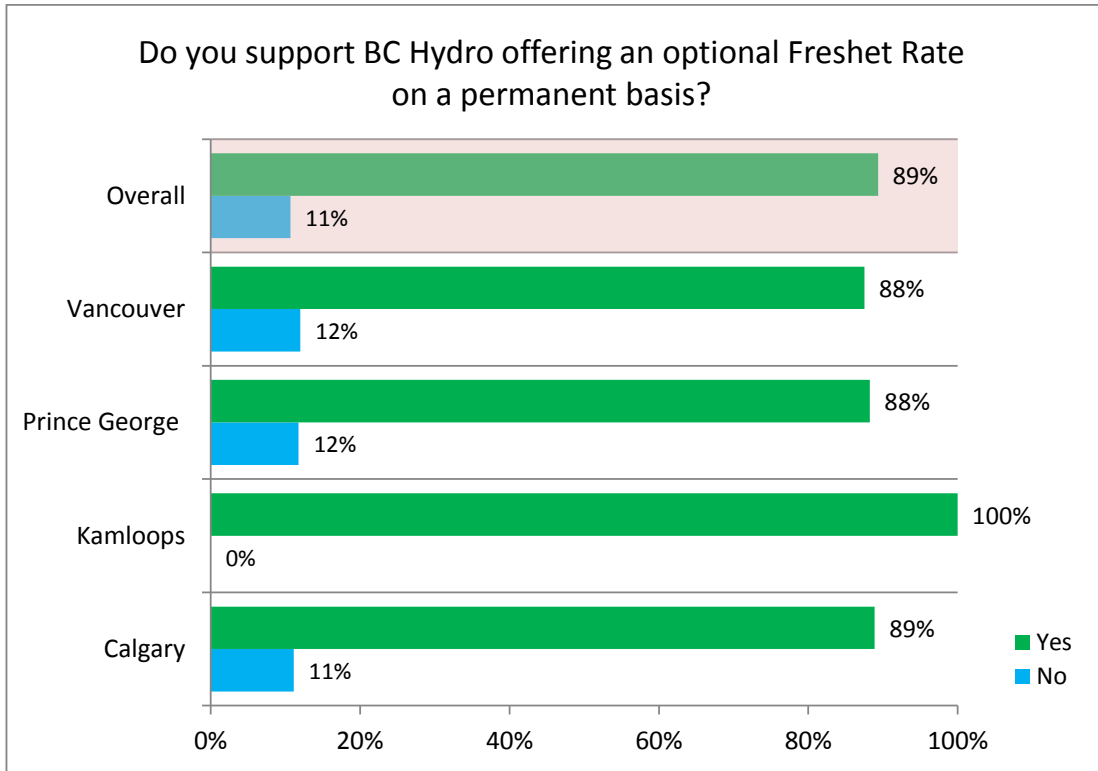


Figure 2: Freshet Rate - Support for Status Quo Term and Conditions (76 total respondents)

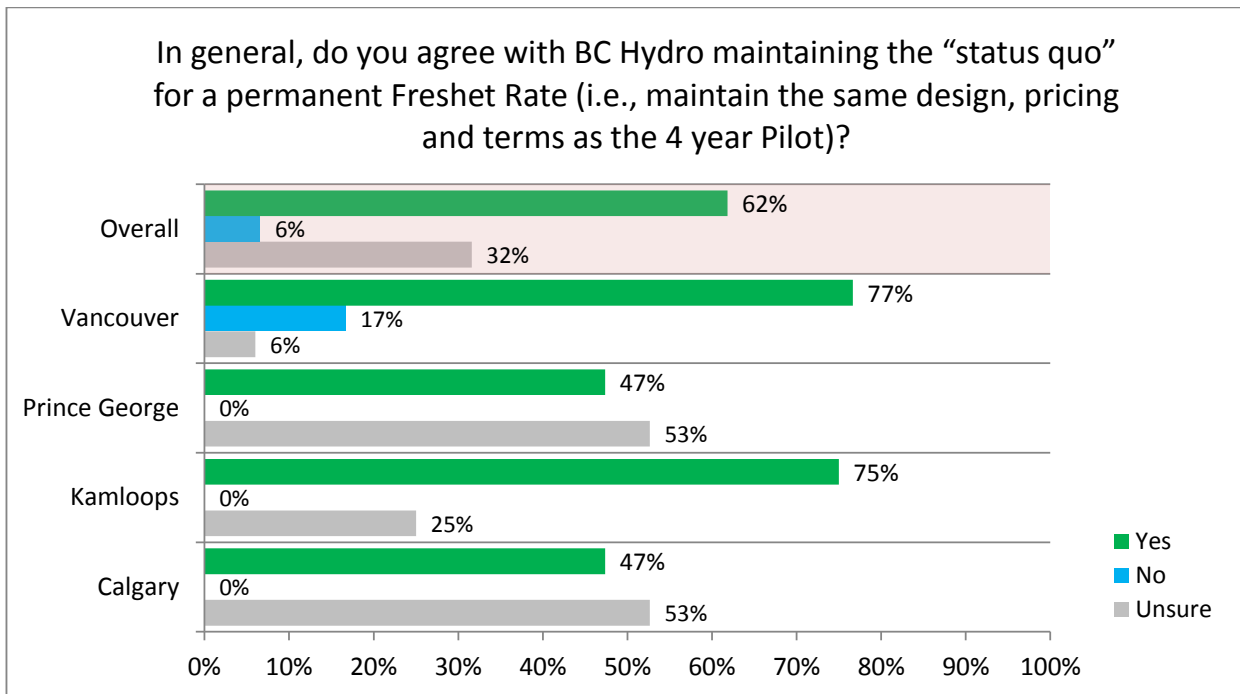
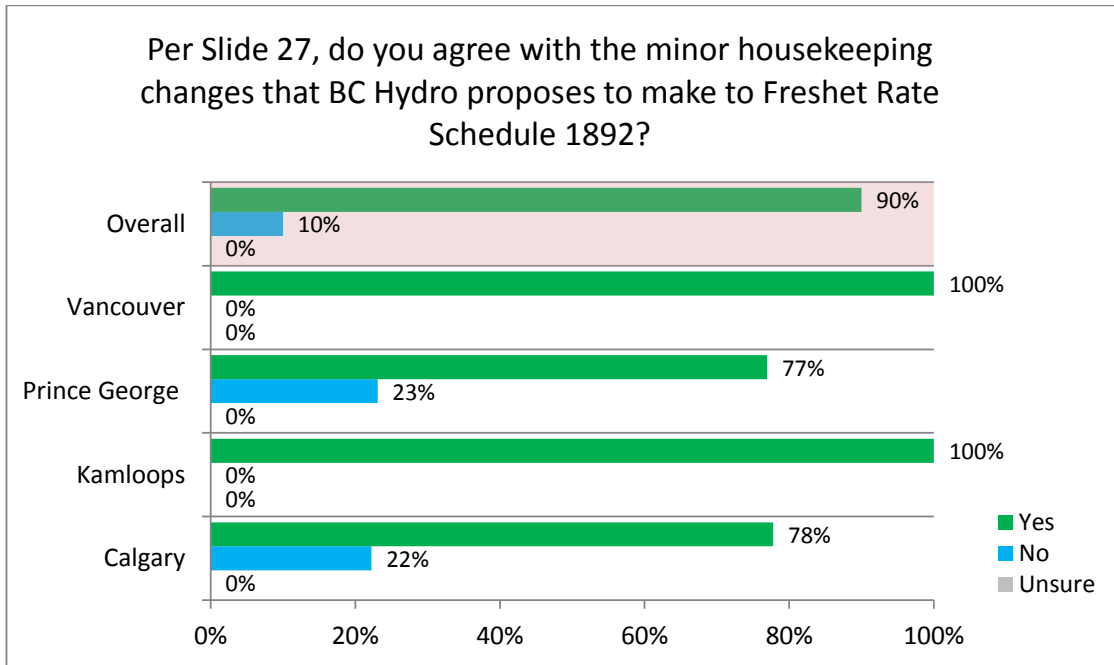


Figure 3: Freshet Rate - Support for Minor/Housekeeping Changes (70 total respondents)



Freshet Rate: Written Feedback

Comments and Questions
Freshet Pilot has been very helpful and should continue
Some uncertainty for 24/7/365 operations (in terms of having available incremental capacity)
Can the Freshet Rate be used by RS 1828 customers as well?
Make power at the lowest possible price for all customers. If power can be cheaper in the Spring, then make it cheaper
(Support the rate) with discussed amendments
Would be beneficial if customer could shift a whole month to a different month (annual total to be the same)
(For new customer) I do not want to wait a year for my baseline to be determined and cannot understand why we cannot use a business driven forecast vs. requiring historical data
Give opportunity to re-assess baselines

PART 3: Incremental Energy Rate – Proposed 3-Year Pilot

Background:

BC Hydro introduced its proposed Incremental Energy Rate, to be made available to customers on a 3-yr pilot basis. Information was provided regarding BC Hydro's proposed rate design, service characteristics, pricing, eligibility criteria and baseline determination. Summary feedback from BC Hydro's October/November 2018 Workshops was shared, with an overview of how prior feedback was considered by BC Hydro and incorporated into the rate design. BC Hydro provided its preliminary estimate of incremental load from the Incremental Energy Rate Pilot and its preliminary forecast of estimated financial impacts, including the use of an energy charge adder to ensure marginal cost recovery. A worked example was provided to illustrate the baseline determination process and monthly reconciliation of net energy purchases.

Key Topics for Review and Discussion:

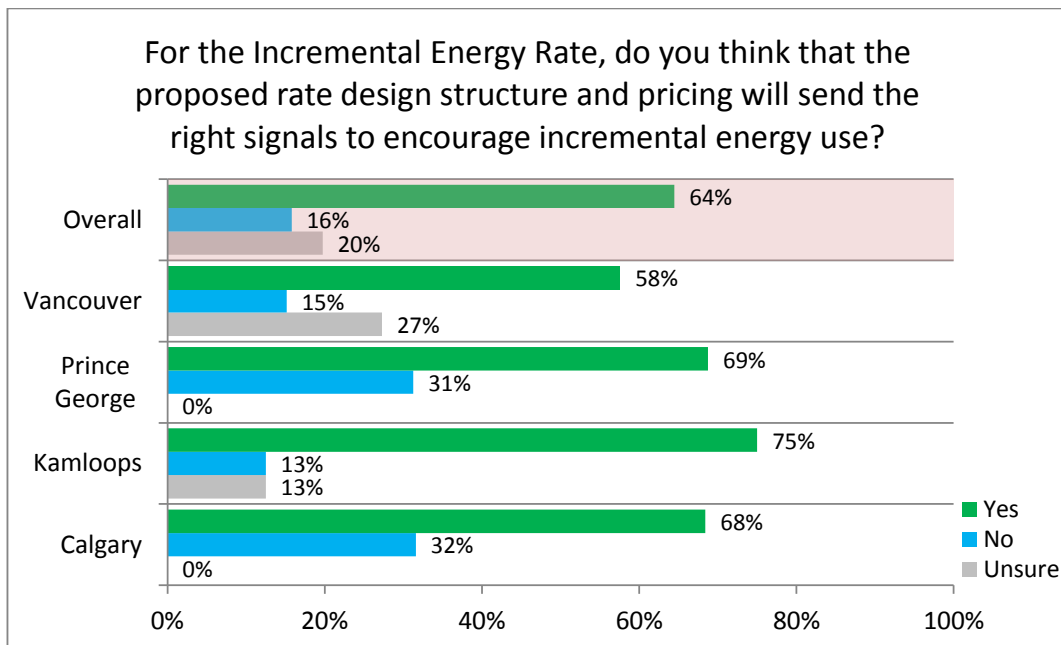
- ❖ Evidence of support
- ❖ Feedback themes from October and November 2018 Workshops
- ❖ Mid-C Market Price History
- ❖ Proposed Incremental Energy Rate Pilot Design
- ❖ Key Eligibility and Design Criteria
- ❖ Energy Adder Alternatives (Shaped vs Flat)
- ❖ Worked Example

Feedback Themes

- There was confirmation (64% overall in favour, per Figure 4) that the proposed Incremental Energy Rate would send efficient price signals to drive incremental load
- There was a mixed response (36% favorable, 36% unfavorable and 28% unsure, per Figure 5) to BC Hydro's proposed eligibility criteria of: (i) at least 2 years of consumption history; and (ii) minimum of 10 MVA ESA Contract Demand. Key customer concerns included:
 - 10 MVA minimum threshold is too high and will limit participation to large load customers only – this is unfair and discriminatory
 - 2-years of consumption history seems too long, as some plants are commissioned and fully operational within 12-months
 - Rate design seems to favour existing large customers vs. prospective new customers from emerging markets/industries
 - Proposed energy charge adder may make the rate prohibitive for participation
 - Certain customers (such as mining) cannot easily change operations in response to day ahead Mid-C pricing as input, production, and shift schedules are set weeks in advance and the facility is typically designed and operated to run at maximum capacity
 - Risk of Mid-C pricing fluctuations may restrict participation
- There was strong understanding and support (94% in favour, per Figure 6) for how energy and demand baselines will be determined and adjusted

- There was a mixed response (32% favourable; 36% unfavourable; 32% unsure, per Figure 7) for the proposed energy charge adder of \$8MWh. Concerns included:
 - How the \$8MWh adder was derived and correlates to BC Hydro and customer risk
 - Proposed adder is too high compared to the Freshet Rate adder (\$3MWh) and standard BPA (Bonneville Power Administration) wheeling rate of approximately CAD\$7/MWh
 - Recommendation to adjust risk adder monthly to fairly address costs/risks
- Customers identified a general preference (57% in favour of Flat; 43% in favour of Shaped, per Figure 8) for the energy charge adder to be “Flat” for each non-freshet month instead of “Shaped”, such that the price would not vary by calendar month.
- When asked if they would have the interest and/or ability to participate in the Incremental Energy Rate Pilot (28% favourable; 49% unfavourable; 23% unsure, per Figure 9), customers sent a clear message that the proposed eligibility criteria would prohibit the participation of smaller sites, with the core issue being the 10MVA minimum size threshold.
- There was strong support (90% overall in favour, per Figure 10) for the proposed Incremental Energy Rate to be introduced on a 3-yr pilot basis.

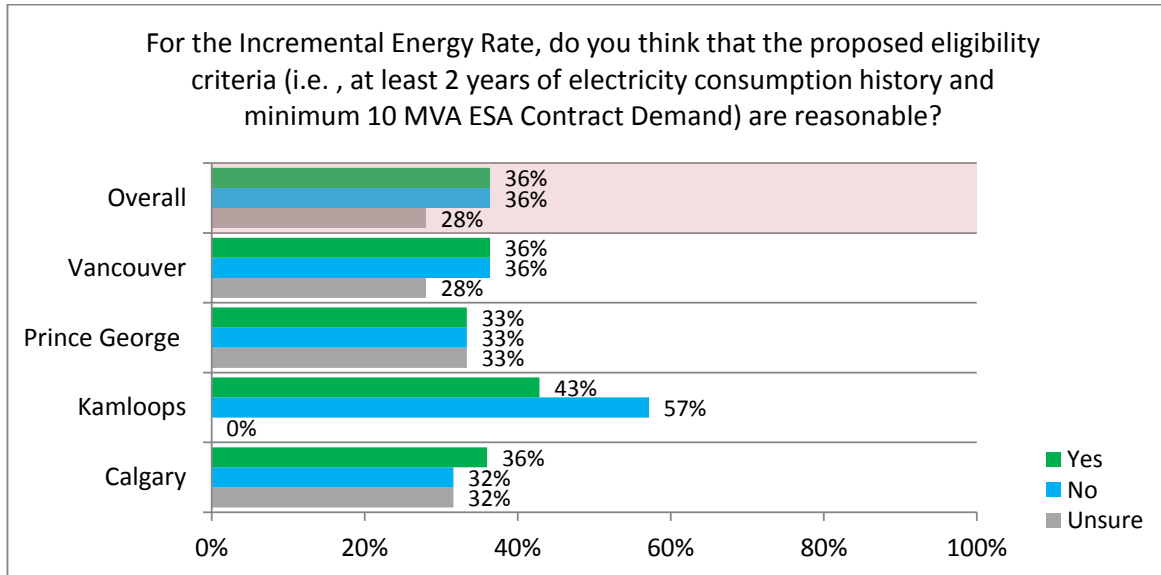
Figure 4: Incremental Energy Rate – Efficient Price Signal (76 total respondents)



Written Feedback

Comments and Questions
RS1823 interaction is complex - it is hard enough to manage the CBL (customer base line) now.
Incremental rate removes the ability to run higher than historical baseline to make up for an unplanned reduction in consumption (e.g., breakdown/curtailment <300MWh event)
24X7X365 operation will need to explore infrastructure upgrades to ramp-up/ramp-down to achieve higher benefits
Overall, incremental energy can be priced attractively and will be protected by the base-line
Simple and flat rate is best
In my view, it seems like a great way to optimize the entire system. However, I do not see many ways that mining customers can participate
None of the sawmills have demand >10MVA
Too large of an eligibility threshold
Yes but many customers have few options to change energy use and this option results in some flexibility
Incremental Energy is difficult to control at solid wood sites, coordinating may not be feasible
Risk of Mid-C pricing may restrict participation. May be limited investment opportunity to take advantage
Adder seems too high
Two years should be changed to 6-months
Capital investment in mining requires operating uptime of 94%
Wheeling fee seems too high
For operations that can alter consumption monthly it can prove beneficial based on price changes
Depends on customer circumstances and message you want to send
The customer will have greater control over managing their costs
Rate will only apply to customers that have idle capacity and are able to increase load. High return plants are already maxed out

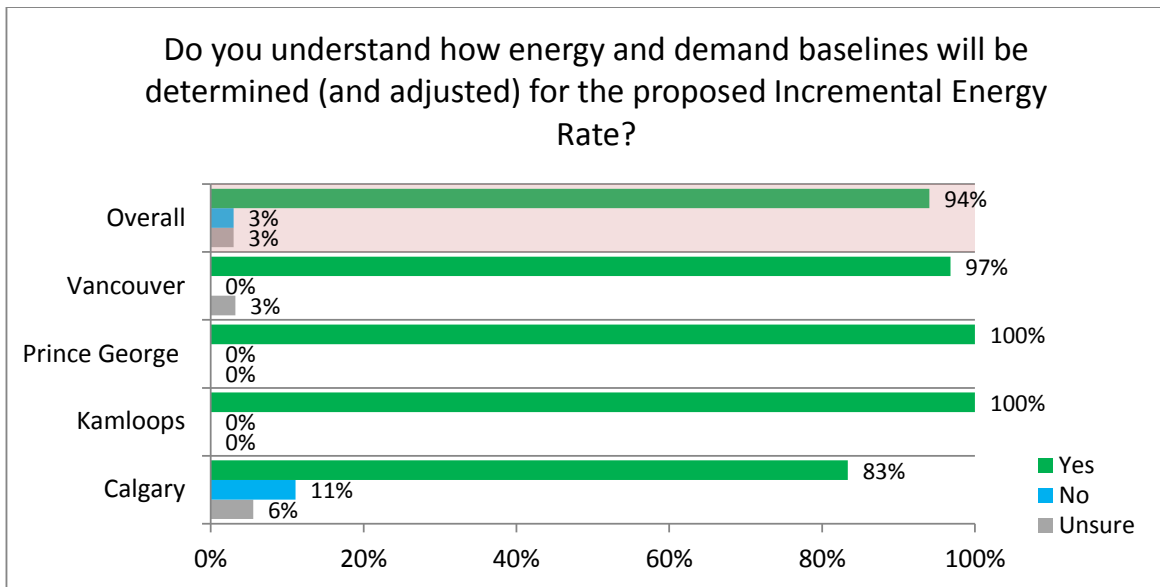
Figure 5: Incremental Energy Rate: Eligibility Criteria (77 total respondents)



Written Feedback

Comments and Questions
(Rate would be) available to established customers, but exclude smaller customers, although they may not have as much impact/potential for incremental load
Our business does not meet this stated eligibility criteria. I do not understand how the benefit of program differs for <10 MVA vs. >10 MVA
For the pilot I would like to see the eligibility requirements lowered once the program is established
It is not worthwhile for small customers to participate
Unsure about contract demand. How is contract demand set at 10 MVA. Why?
10 MVA unfair for small business?
Cuts out smaller users: None of the sawmills have demand >10 MVA
Participation will depend on TSR hurdles
Most sawmills are under 10 MVA but as mentioned not easy to control, so minimum load may not apply anyways
10 MVA may be too high for smaller plants unless aggregations are counted
Incent new mining?
There is no need for pricing schemes
Consider 2 MW (minimum) and 6-months (load history) for new industry
Eligibility criteria should be less than 2 years and 5 MVA
10 MVA too high
Impact is more material for larger operations; needs to be effective to administer
10 MVA too high for some connected loads
Eligibility criteria should be set to capture latent industrial loads that can't afford to operate at Tier 2 rate
Should follow the customer base line principle of one year (from TS 74)
Yes to 2 years; No to 10 MVA
Consider < 2 years for industry that is fully commissioned in Year 1

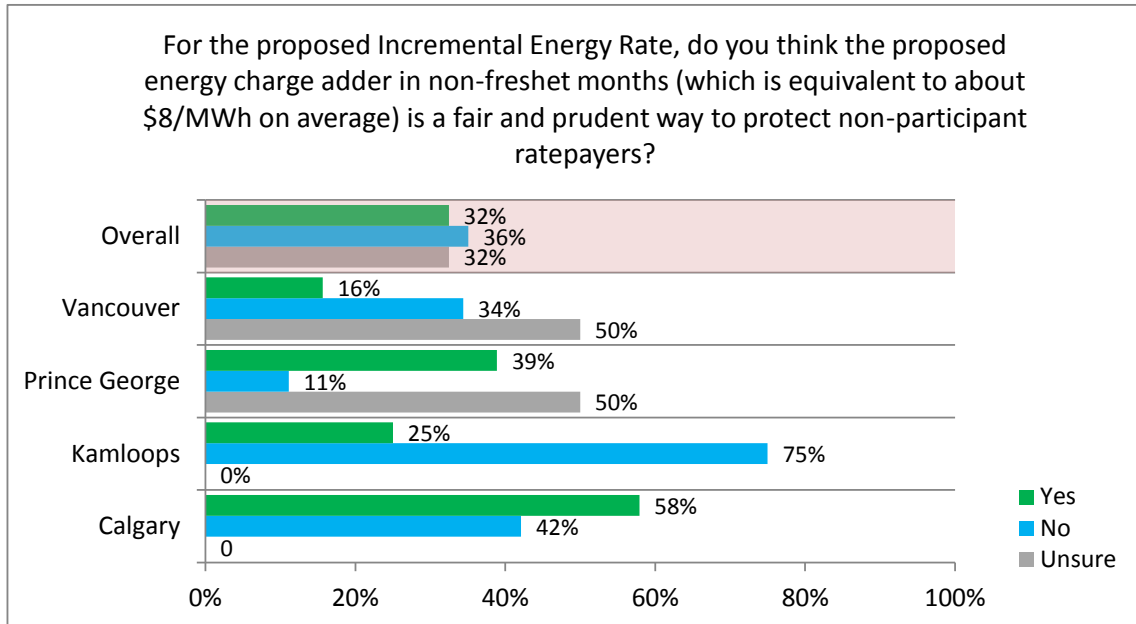
Figure 6: Incremental Energy Rate: Baseline Determination (67 total respondents)



Written Feedback

Comments and Questions
Seems reasonable, although may not agree if new baseline for demand is not achieved
Hands on interactive model (worked example) helped; nice example
Would like a bit more discussion need to go through a the math and a real world example based on my companies profile
Unsure how it is planned to be applied (adjustments)
There is no need for pricing schemes

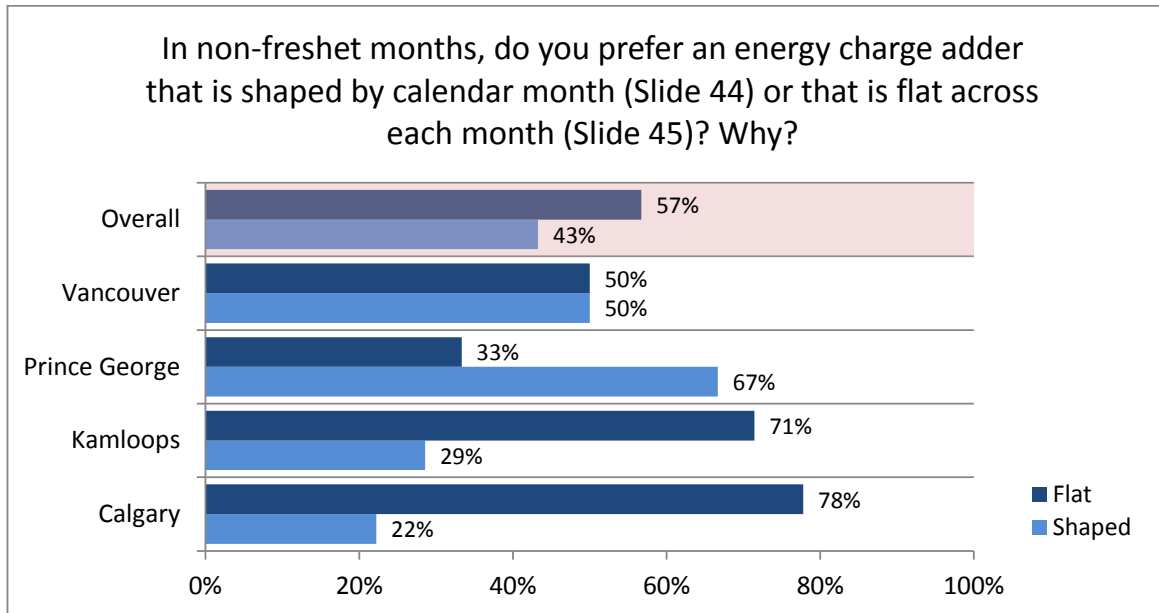
Figure 7: Incremental Energy Rate: Risk Mitigation for Non-Participants (77 total respondents)



Written Feedback

Comments and Questions
Not always importing electricity. Majority of years other than last year there were more exports than imports
The logic behind the decided rate is not transparent. BC Hydro previously proposed \$6/MWh, but now one bad year (2019 freshet) has made it \$8/MWh
\$8/MWh seems to be on the high side. A reduced adder of \$5-6/MWh is more reasonable
It feels like one bad year is affecting prices substantially due to risk aversion
Volatile market so it is fair to charge \$8/MWh for risk of marginal price variability
Will have to look at the data
Smoothing is better to forecast, but more at risk
Seems a bit high since there is a mutual benefit
Seems to assume that BC Hydro will always be importing electricity
Adder should be dynamic based on actual market costs
Way too high, seems like an arbitrary number
Customers are taking enough risk already
Customers that need this rate most might be unable to participate (if adder makes the service uneconomic)
Based on pricing levels may or may not be beneficial. I feel this is an internal BC Hydro decision
This is a BCUC decision
Do not have enough history to assess whether \$8/MWh is prudent or not
The energy related revenues will be treated as an opportunity sale
Adder can provide an offset to operation and maintenance costs, which provide system-wide benefits
Adder approach is simple
As long as "revenue" is not too high at the end of pilot

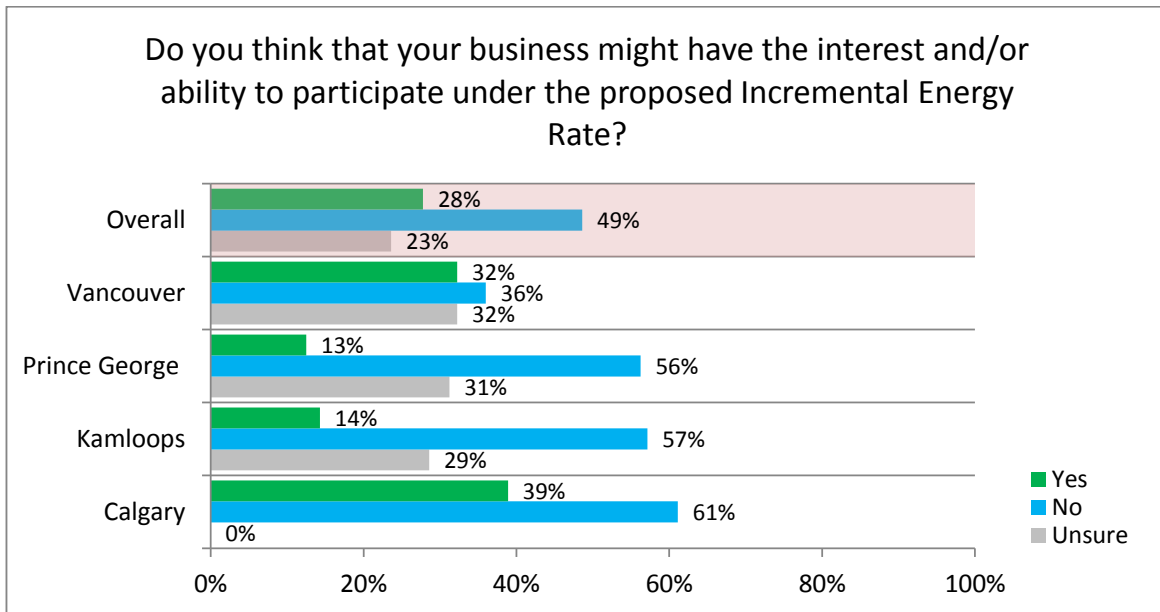
Figure 8: Incremental Energy Rate - Energy Charge Adder Pricing (67 total respondents)



Written Feedback

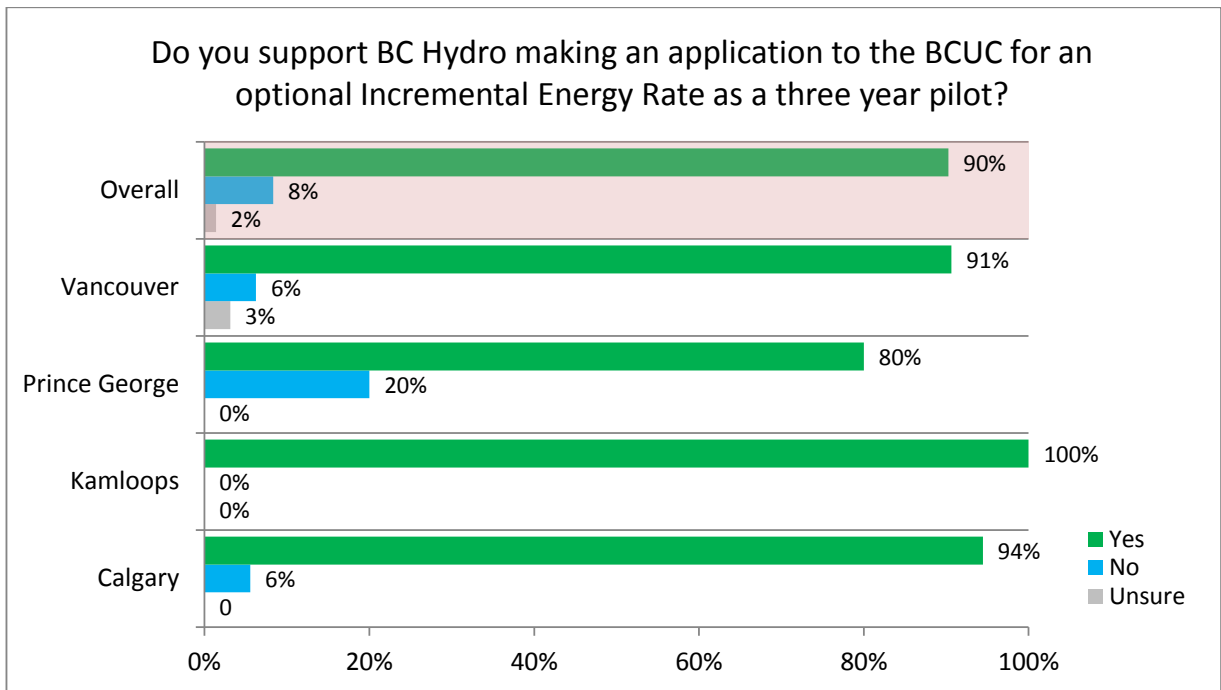
Comments and Questions
Shaped adder reflects risk better
Flat is easier for budgeting. Winter months have other higher production costs
Shaped is better as it reflects Hydro’s cost more “accurately”
Flat offers more predictability in cost
I am not sure, shape protects maintenance shutdowns while flat protects winter operation
Flat would be best – it simplifies the explanation of energy costs to staff
Shaped, as I believe it better matches the cost of market imports
Shaped - more opportunity to take advantage
Probably not significant enough either way
Mid-C price will be the big/main driver (not the adder)
Shaped energy adder seems like the right thing to do
Shaped by calendar month
Flat is simpler and easy to manage
Flat for simplicity and for budget forecast/operation plan
Adder should be lower, to reduce customer risk
Flat ... keep it simple

Figure 9: Incremental Energy Rate: Customer Interest / Ability to Participate (72 total respondents)



No written feedback was provided to this question. Customers referred BC Hydro to their responses from prior questions.

Figure 10: Incremental Energy Rate - Support for 3-year Pilot (72 total respondents)



No written feedback was provided to this question. Customers referred BC Hydro to their responses from prior questions.

PART 5: Additional Comments Received

Background:

BC Hydro received additional written comments from the submitted feedback forms, as summarized below.

Additional Comments
Thank-you for putting this workshop on. I always learn something and I appreciate you putting up with all my questions
Thank-you for the informative workshop as the info will be useful in navigating the interaction with BC Hydro
Good presentation as usual
Thanks for the review of the rates and changes
Great info! Thank-you
General feedback is that a lot of new material was presented with an ask to provide for comment on the spot, tough to consider specifics without time to reflect
These information sessions are always helpful. Dave and Jane have a great approach when explaining and seeking input.
Thank-you for an excellent presentation
Thank-you for organizing the workshop. Found it useful and informative
Good job of presenting the information Dave!
Structured well, received the information that I required (rate forecast). Enjoyed poll voting interaction
Good interactive discussion
Enjoyed the workshop, good refresher on how rates are calculated and applied
Well-presented and informative
Economic Curtailment (Gas price) does that meet definition for non-recurring downtime?
Consider regulated outages as non-recurring downtime
Great presentation and discussion. Next year an explanation on IPPs would be useful
Every time BC Hydro releases a new pricing scheme, it gives the appearance that the utility is trying to trick its customers into playing a complicated game that may or may not be in the customer's benefit. These schemes never have any risk to Hydro, only to the customer. It would be much preferable for the utility to set the price of power in accordance with its cost to produce, plus a margin to fund new projects. The existing process of regular reviews by the utility commission will ensure that pricing is set in a fair and justifiable manner. Power pricing should be simple enough so as to not require a half-day workshop to explain it.