

Chris Sandve
Chief Regulatory Officer
bchydroregulatorygroup@bchydro.com

April 29, 2024

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

Dear Patrick Wruck:

**RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Rate Schedules 1823 and 1828 Billing Demand Interpretation for
Customers Served under Rate Schedules 1892 and 1893**

BC Hydro writes to inform the Commission of errors we recently discovered that have resulted in transmission customers being under-billed for demand under Rate Schedule (RS) 1823 (Transmission Service – Stepped Rate) and RS 1828 (Transmission Service – Biomass Energy Program) when those customers also receive service under RS 1892 (Transmission Service – Freshet Energy) or RS 1893 (Transmission Service – Incremental Energy Rate), and to apply to the Commission for certain orders in response to the discovery and mitigation of these errors.

BC Hydro is filing two versions of this letter – one that is unredacted to be held in confidence by the BCUC, and one that is redacted that can be posted publicly if necessary. BC Hydro has redacted certain information in the public version of this letter because we believe it could reveal commercially sensitive information about a specific customer or customers. BC Hydro therefore requests that this information be held in confidence in perpetuity.

The Freshet and Incremental Energy Rates are optional transmission service rates that were intended to encourage incremental consumption through access to market pricing on an interruptible basis. As the incremental energy is interruptible, there are no incremental demand charges for customers receiving service on these rates.

These rates are complex. For participating customers, electricity service on the Freshet and Incremental Energy Rates is not separately metered. This requires a set of baselines for each participating customer designed to reflect normal operations during a prior year. Under these optional rates, customers do not pay incremental demand charges for electricity consumption above these baselines which is priced at the market-referenced rates. For billing purposes, modifications were required to the Billing Demand provisions in the rate schedules to avoid penalizing participating customers for this incremental electricity use through higher demand charges on their underlying base

rate. To account for this, Billing Demand language was included in the tariff sheets for the Freshet and Incremental Energy Rates that is meant to work in concert with the Billing Demand language in the base RS 1823 or RS 1828 rate.

The errors relate to incorrect billing instructions being provided when the Freshet Energy rate pilot was first implemented in 2016 and subsequent incorrect billing instructions being provided when the Incremental Energy Rate was implemented. At the time and since that time, BC Hydro did not properly incorporate the RS 1823 or RS 1828 demand charge ratchet provisions (i.e., part (b) and (c) of the Billing Demand formulas in RS 1823 and RS 1828) for customers who participated in RS 1892 or RS 1893, which act as a minimum charge for customers. This has resulted in potential under-billing for 20 unique transmission voltage customer sites between fiscal 2017 and fiscal 2024.

For the reasons discussed in this submission, BC Hydro does not believe it would be appropriate to back-bill customers for this potential underbilling. Accordingly, BC Hydro requests that the Commission:

- Provide consent to BC Hydro under section 63 of the *Utilities Commission Act (UCA)* to charge demand charges that are less than specified in the applicable rate schedules and not back-bill customers for any difference in RS 1823 and RS 1828 demand charges resulting from the correction of BC Hydro's errors; and
- Approve a reduction in the regulatory account asset balances related to the estimated under-collected amounts resulting from BC Hydro's error in the Load Variance Regulatory Account in fiscal 2024, which is estimated to be \$7.53 million.¹ The reduction would mean that no ratepayers pay for these amounts and would reduce BC Hydro's fiscal 2024 net income by the same amount.

The amount of potential under-recovery from the application of incorrect billing formulas in this instance is significant. The Commission and customers need to have confidence that BC Hydro is correctly applying and billing the approved rates and their associated complexities. As a result, BC Hydro is taking direct and timely action to review the billing instructions and implementation processes for other rates, with a focus on those with a higher degree of risk or complexity, to ensure accuracy and mitigate the risk of future errors.

A draft order is provided in Attachment 1.

¹ For the reasons explained in this Application, BC Hydro submits that \$7.53 million (or \$7,529,546 before rounding) is a reasonable high-end estimate of the amount of under-recovery from this error.

Background

RS 1892 (Transmission Service – Freshet Energy) was proposed in BC Hydro’s 2015 Rate Design Application and approved by BCUC Order No. G-17-16. It was offered on an optional basis to transmission service customers as an add-on to the customer’s default transmission service rate, RS 1823.²

RS 1892 offers non-firm, interruptible electricity service above normal RS 1823 baseline amounts during the freshet months (May through July). It has energy pricing referenced to the Mid-Columbia (**Mid-C**) market prices, plus an additional energy charge adder for margin and risk of \$3/MWh.

RS 1892 was initially offered as a three-year pilot from 2016 to 2018 and extended for an additional year (2019). BC Hydro requested that RS 1892 be made permanent in its Transmission Service Market Reference-Priced Rates Application in 2019 and this was approved by BCUC Order No. G-104-20.

RS 1893 (Transmission Service – Incremental Energy Rate) was approved on October 14, 2020, as a pilot program effective from January 1, 2020, to March 31, 2024, by BCUC Order No. G-256-20. It was offered on an optional basis to transmission service customers as an add-on to the customer’s default transmission service rate, RS 1823 or RS 1828.

RS 1893 applied to electricity usage above pre-determined monthly baselines for energy and demand. It was offered to transmission service customers on a non-firm, interruptible, and year-round basis. Energy pricing was referenced to daily Mid-C market prices, plus an additional energy charge adder for margin and risk of \$7/MWh in non-freshet months and \$3/MWh in freshet months. The RS 1893 pilot has now concluded and BC Hydro did not request that this rate be extended or become permanent.³

² RS 1892 availability was extended to customers supplied under RS 1828 Transmission Service – Biomass Energy Program effective April 1, 2020.

³ Please refer to BC Hydro’s letter to the BCUC dated February 15, 2024, available at: <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-matters/00-2024-02-15-bch-tsmr-compl-G-256-20-d2-ff.pdf>

Billing Demand for Customers on RS 1892 and RS 1893

RS 1892 and RS 1893 do not have demand charges. As RS 1892 and RS 1893 are non-firm rates, electricity purchased by a customer under RS 1892 or RS 1893 does not increase the customer's demand charges.^{4,5}

The electricity supplied to the customer under RS 1823 or RS 1828 and RS 1892 or RS 1893 is measured by metering that does not distinguish one rate versus the other. Accordingly, to ensure that the incremental energy provided under RS 1892 and RS 1893 did not increase Billing Demand under RS 1823 or RS 1828, the tariff sheets included the following provisions (emphasis added):

- RS 1892:⁶

"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:

1. The Reference Demand; or

⁴ BC Hydro's 2015 Rate Design Application included the following information regarding demand charge billing under RS 1892: "Since the rate is non-firm, BC Hydro proposes that there be no demand charge for load above a Reference Demand baseline which will be set using the average of peak kVA demands during HLH from each month of the 2015 freshet period. Customers on RS 1892 will be billed for demand up to their Reference Demand baseline under RS 1823 in each of the freshet months (May, June and July) during the 2016 and 2017 freshet periods so long as they have consumed energy on RS 1892." See pages 7-34 and 7-35, available at: <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-matters/2015-rda.pdf>

⁵ BC Hydro's Transmission Service Market Reference-Priced Rates Application (2019) included the following information regarding the demand charge billing under RS 1893: "As the proposed RS 1893 is non-firm and interruptible, there is no demand charge for load taken above the Monthly Reference Demand during HLH of the Billing Period. The Billing Demand determination under RS 1823 or RS 1828 will incorporate the lesser of Reference Demand and the actual highest kVA demand during HLH in the Billing Period." See page 63, available at: <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/mrpra/2019-11-26-transmission-service-market-reference-exhibit-b-1.pdf>

⁶ Note that in accordance with BCUC Order No. G-353-23, RS 1892 was amended effective April 1, 2024, to allow customers receiving service under RS 1830 to also participate on RS 1892. For the purpose of this submission, we have provided the original tariff language at the time RS 1892 was approved on a permanent basis in accordance with BCUC Order No. G-104-20.

2. The actual highest kVA Demand during the High Load Hours in the Billing Period.”

• RS 1893:⁷

“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:

1. The Monthly Reference Demand; or
2. The actual highest kVA Demand during the High Load Hours in the Billing Period.”

RS 1823 states that Billing Demand is the highest of the following (emphasis added):

“(a) The highest kVA Demand during the High Load Hours (HLH) in the Billing Period; or

(b) 75% of the highest Billing Demand for the Customer’s Plant in the immediately preceding period of November to February, both months included; or

(c) 50% of the Contract Demand stated in the Electricity Supply Agreement for the Customer’s Plant.”

RS 1828 states that Billing Demand is the highest of the following (emphasis added):

“(a) The highest kVA Demand during the High Load Hours (HLH) in the Billing Period; or

(b) 75% of the highest Billing Demand for the Customer’s Plant in the immediately preceding period of November to February, both months included.”

Parts (b) and (c) are often referred to as “demand ratchets” because they effectively set a minimum demand charge for transmission customers that is tied to peak demand in winter or the Contract Demand specified in their Electricity Supply Agreement (**ESA**) (if applicable), whichever is higher, regardless of the actual demand in a particular billing period.

When these sections are read together for customers taking service under RS 1892 or RS 1893, part (a) of the Billing Demand formula under RS 1823 or RS 1828 – i.e., “the highest kVA Demand during the High Load Hours (HLH) in the Billing Period” – should

⁷ As noted previously, RS 1893 is no longer in effect. For the purpose of this submission, we have provided the original tariff language at the time the RS 1893 pilot program was approved in accordance with BCUC Order No G-256-20.

be replaced with the lesser of: (1) The Reference Demand (for RS 1892) or Monthly Reference Demand (for RS 1893); or (2) The actual highest kVA Demand during the High Load Hours in the Billing Period. Accordingly, Billing Demand under RS 1823 for customers also receiving service under RS 1892 and RS 1893 is the highest of the following:

- (a) The lesser of: (1) the Reference Demand (for customers also receiving service under RS 1892) or the Monthly Reference Demand (for customers also receiving service under RS 1893); or (2) the actual highest kVA Demand during the High Load Hours in the Billing Period; or
- (b) 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February, both months included; or
- (c) 50% of the Contract Demand stated in the Electricity Supply Agreement for the Customer's Plant.

Similarly, Billing Demand under RS 1828 for customers also receiving service under RS 1892 and RS 1893 is the highest of the following:

- (a) The lesser of: (1) the Reference Demand (for customers also receiving service under RS 1892) or the Monthly Reference Demand (for customers also receiving service under RS 1893); or (2) the actual highest kVA Demand during the High Load Hours in the Billing Period; or
- (b) 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February, both months included.

Description of the Errors

Between 2016 and 2020, an incorrect formula was programmed and subsequently used in BC Hydro's billing software to calculate Billing Demand under RS 1823 for customers also receiving service under RS 1892. The incorrect formula was as follows:

"The lesser of:

- Reference demand
- The greater of:
 - the actual highest kVA Demand during the High Load Hours (HLH) in the Billing Period; or
 - 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February, both months included; or
 - 50% of the Contract Demand stated in the Electricity Supply Agreement for the Customer's Plant."

In most cases, this incorrect formula would provide the same Billing Demand as intended, because, for most customers, their Reference Demand and actual demand in freshet is higher than the demand ratchets such that Billing Demand is equal to Reference Demand, the same as under the correct formula. However, this incorrect formula would result in lower Billing Demand than intended if a customer's Reference Demand was lower than one or both demand ratchets. For most customers the demand ratchets were not applicable.

Provision of incorrect billing instructions led to incorrect specifications in the requirements documentation for the necessary billing changes to support the Freshet Energy (RS 1892) pilot, which resulted in the demand ratchets not being applied correctly on customers' bills.

The year-round Incremental Energy Rate (RS 1893) adopted the same Billing Demand tariff language as RS 1892. When RS 1893 was first implemented in 2020, the billing instructions were simplified from what was put in place for RS 1892 in response to customer concerns that the winter peak demand ratchet would be reset for future periods if consumption on the Incremental Energy Rate exceeded baseline consumption during the peak winter months.⁸

The new formula that was implemented for the Incremental Energy Rate pilot resulted in a similar failure to apply the RS 1823 and RS 1828 demand ratchets for customers also receiving service under RS 1893. That incorrect formula was as follows:

"The lesser of:

- The Monthly Reference Demand
- The actual highest kVA Demand during the High Load Hours (HLH) in the Billing Period."

This formula did not include the demand ratchets at all – that is, 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February (part (b) in the Billing Demand formula under RS 1823 and RS 1828) and 50% of the Contract Demand (part (c) in the Billing Demand formula under RS 1823) were omitted. This meant that the calculation of Billing Demand for these customers under RS 1823 and RS 1828 was based only on the lesser of Monthly Reference Demand and the highest kVA Demand during the HLH in the Billing Period, and the demand ratchets were not included. This simplification of the billing instructions in response to customer feedback was not consistent with the tariff.

In the course of investigating the conditions that led to this error, we determined there were insufficient sign-off procedures regarding these instructions.

⁸ This modification in response to customer feedback was not actually necessary, as had the billing instructions correctly followed the approved tariff language, ratchet charges for future billing periods would not have been reset based on incremental consumption.

During the implementation of the RS 1893 pilot, there was an expectation that demand charges for customers participating in RS 1893 would be calculated and billed in the same way as for RS 1892, but on a year-round basis. For that reason, in July of 2021, a request was made to update the Billing Demand formula for customers receiving service under RS 1892 so that it matched the incorrect Billing Demand formula for customers receiving service under RS 1893. These changes were implemented in May of 2022. Again, there were insufficient sign-off procedures regarding these instructions.

Customer Understanding of the Billing Demand Formula

In BC Hydro's customer consultation materials for RS 1892 and RS 1893, provided as Attachments 2 and 3, demand charges were discussed on several occasions. These materials simplified the discussion of demand charges under RS 1892 and RS 1893, which may have given customers an incorrect understanding. For example, previous customer presentations on RS 1892 and RS 1893 included the following messages:

“RS 1823 monthly demand charge is lesser of Reference Demand or actual demand” – Attachment 2, slide 27.

“No demand charge for load > Reference Demand” – Attachment 3, slide 22.

“No demand charge for load above Monthly Reference Demand” – Attachment 3, slide 38.

The discussion was simplified for the purpose of a presentation. For completeness, the presentation could have included a note that demand ratchets continue to apply.

Since the introduction of the Incremental Energy Rate pilot, BC Hydro has also confirmed to customers interested in these rates that the demand ratchets under their base rate would not be applied, even though they should have been.

Estimate of Potential Under-Collection

BC Hydro has developed an estimate of the impact to ratepayers resulting from the billing errors. Any under-collection of demand charge revenue from affected customers because of the billing errors would have impacted the balance in the Load Variance Regulatory Account which is recovered from, or refunded to, all ratepayers through the Deferral Account Rate Rider. If left unaddressed, this means that the errors result in other customers paying higher rates than they would have otherwise.

Out of a total of 59 customer sites that participated in RS 1892 and RS 1893 from fiscal 2017 to fiscal 2024, 20 individual customer sites were impacted by the billing errors.

The estimate of the total possible under-recovery of demand charge revenue depends on the assumptions used, and in particular assumptions about how applicable customers would have acted if the demand ratchets were properly applied.

For customers with normal operations, the incorrect billing formulas did not have significant billing impacts. However, for customers that were permanently shut down or curtailed, did not reduce their ESA Contract Demand and took service under RS 1892 or RS 1893, the incorrect billing formulas resulted in materially lower demand charges than would have otherwise been calculated.

BC Hydro calculated the difference between actual demand charge revenue and the demand charge revenue that BC Hydro could have collected from these customers under the correct Billing Demand formula if they would have continued to participate on either RS 1892 or RS 1893 and pay the higher demand charges.

The results of this analysis by site status are shown in [Table 1](#) below.

Table 1 Difference in Demand Charges by Site Status

\$ million	F2017	F2018	F2019	F2020	F2021	F2022	F2023	F2024	Total F2017 - F2024
(a) Normal Operations	0.07	0.03	0.14	0.13	0.30	0.04	0.31	0.29	1.33
(b) Temporarily Shut down / Curtailed	-	-	-	-	1.36	1.00	2.33	1.51	6.20
(c) Permanently Shut down / Curtailed	-	-	-	-	-	-	█	█	█
(d) Total (a)+(b)+(c)	0.07	0.03	0.14	0.13	1.67	1.03	█	█	█
(e) Potential Under-Recovery (a)+(b)	0.07	0.03	0.14	0.13	1.67	1.03	2.64	1.81	7.53

The last column of row (d) in [Table 1](#) shows that the total billing discrepancy for the 20 affected customer sites from fiscal 2017 to fiscal 2024 is estimated to be █ and, of this total, █ was in relation to █ sites during periods that they were permanently shut down or curtailed and also took service on the rate.

BC Hydro believes that if the correct Billing Demand formula was used and communicated correctly, these █ customer sites would likely have reduced the Contract Demands in their ESAs to avoid the 50% of Contract Demand ratchet earlier.⁹

⁹ BC Hydro informed the BCUC in a letter on February 15, 2024, that it had decided not to extend RS 1893 for an additional year on a temporary basis. █

This means that the difference in demand charges likely does not represent an under-recovery (i.e., BC Hydro would not have received this demand revenue from those customers if the correct Billing Demand formula was used and understood by customers).

Based on this analysis, BC Hydro believes that our use of the incorrect Billing Demand formulas resulted in under-billing to affected customers that has the effect of all other ratepayers being adversely impacted by an estimated \$7.53 million from fiscal 2017 to fiscal 2024, after excluding sites that were shut down (i.e., the last column of row (e) in [Table 1](#) above). BC Hydro believes that this is a conservative estimate (i.e., a higher amount than might have actually occurred) since this amount might have been further reduced had customers with temporary curtailments changed their behaviour, perhaps by not participating in RS 1892 and RS 1893 at all or by reducing the Contract Demand under their respective ESA. Only \$1.33 million of the \$7.53 million related to sites with normal operations.

Orders Sought

BC Hydro is not seeking any changes to RS 1892 or RS 1893 because of the discovery of the incorrect billing formulas. In BC Hydro's view, the demand charges set out in RS 1892 and RS 1893, as approved by the Commission, are appropriate. Moreover, RS 1893 is no longer in effect.

Section 63 of the UCA states:

“A public utility must not, without the consent of the commission, directly or indirectly, in any way charge, demand, collect or receive from any person for a regulated service provided by it, or to be provided by it, compensation that is greater than, less than or other than that specified in the subsisting schedules of the utility applicable to that service and filed under this Act.”

BC Hydro is seeking consent from the Commission under section 63 of the UCA to not back-bill customers for any difference in RS 1823 and RS 1828 demand charges resulting from correction of BC Hydro's error (i.e., to collect compensation from the affected customers that is less than specified in RS 1823 and RS 1828), because:

- The errors have occurred since the implementation of RS 1892 and RS 1893;
- BC Hydro incorrectly confirmed its initial misinterpretation of the RS 1892 billing formula and confirmed subsequent changes to the RS 1892 and RS 1893 billing formulas to customers since that time;
- If the Billing Demand provisions under RS 1823, RS 1828, RS 1892, and RS 1893 had been applied and communicated properly, some of the affected customers, particularly those with permanently or partially shut-down facilities over the past two years, likely would have changed their behaviour, perhaps by not participating in RS 1892 and RS 1893 at all or by reducing the Contract Demand under their respective ESA; and

- It would be difficult to objectively determine how much, if any, customers should be back-billed for demand charges given that those customers likely would have changed their behaviour if the demand charges had been applied correctly.

BC Hydro also requests the Commission's approval to reduce the balance of the Load Variance Regulatory Account related to the estimated under-collected amount resulting from BC Hydro's error, which is estimated at \$7.53 million (or \$7,529,546 before rounding). The reduction would ensure that no ratepayers pay for these amounts and would reduce BC Hydro's fiscal 2024 net income by the same amount.

The \$7.53 million amount is BC Hydro's conservative estimate of the incremental demand charge revenue that BC Hydro should have billed to customers taking service under RS 1823 or RS 1828 and RS 1892 or RS 1893 from fiscal 2017 through fiscal 2024, after accounting for customers with permanently shut-down facilities over the past two years that would likely have reduced their Contract Demand under their respective ESA if the Billing Demand provisions had been applied and communicated properly.¹⁰

Actions Taken by BC Hydro

The error in the application of Billing Demand in this instance has been identified as a misinterpretation of the provisions of the rate schedules, leading to incorrect billing instructions being provided to the implementation team when the rates were programmed into our SAP billing system. These particular rates are highly complex, and as the corresponding testing scenarios would have been based on the billing instructions provided, the implementation team alone would not have discovered the interpretation error through testing.

Our investigation has further identified that an insufficient approval and control process for new rates and modification of historical rates was in place at the time these rates were implemented. This resulted in a situation that enabled non-compliant rates being implemented. BC Hydro has since taken actions to strengthen and standardize the sign-off process which would have mitigated these errors.

In response to the discovery of these errors, BC Hydro has initiated a review that includes the following objectives:

1. Confirm that the billing system specifications comply with the Electric Tariff for all rate schedules currently offered to customers.

This action will include a side-by-side comparison of each rate schedule with the corresponding documentation provided to the implementation teams. This work will

¹⁰ BC Hydro believes this is a conservative estimate. Any change in behaviour by customers with temporary curtailments in response to the correct application and communication of Billing Demand under RS 1823, RS 1828, RS 1892, and RS 1893 would have resulted in customers paying less demand charges than represented by this estimate.

be prioritized based on the complexity of each rate (which impacts the potential for misinterpretation of the requirements) and the revenue associated with the rate schedule. Given their greater complexity, this will generally result in transmission rates being the first reviewed; and

2. Review and modify as necessary the control processes followed in the implementation of new or modified rates to ensure:
 - Appropriate authorization procedures are in place prior to the initiation of a new rate or modification of an existing rate; and
 - The potential for implementation of an incorrect billing instruction is mitigated through upfront approval of programming requirements, approval of the implementation test plan, and acceptance of test results by all key stakeholders including BC Hydro's regulatory team and other teams as appropriate.

BC Hydro notes that recent rate implementations and modifications including RS 1830 (Transmission Service), RS 1901 (Deferral Account Rate Rider), and RS 1904 (Trade Income Rate Rider) have followed more robust approval procedures than those that were in place when RS 1892 and RS 1893 were implemented. Similarly, more robust approval processes are being used during implementation of the upcoming RS 2101 (Residential Service – Time of Day). This notwithstanding, it is prudent to review the control processes specifically regarding the approval and acceptance of billing instructions such that any remaining process gaps can be mitigated and control steps fully documented.

3. Investigate the potential for additional revenue assurance controls to detect potential billing issues:

BC Hydro will investigate if additional reporting and analytics could be implemented that would be effective in detecting situations in which the rates implemented in our billing system are not consistent with tariff provisions. This would provide additional confidence that billing implementation errors not identified through testing procedures could be identified and rectified in a timely manner. Included in this review would be an assessment of roles and responsibilities regarding rate compliance reporting.

BC Hydro will focus initially on rates that include a demand charge given the complex nature of demand ratchets, particularly when demand charges are affected by provisions of optional, add-on rates.

BC Hydro will provide the BCUC with a copy of the management review summary report once complete, including any resulting recommendations and actions.

Lastly, BC Hydro has informed customers that have elected to take service under RS 1892 for the upcoming freshet period starting in May of the correct Billing Demand formula that will be used going forward. A copy of the communication provided to customers is provided as Attachment 4.

April 29, 2024
Patrick Wruck
Commission Secretary and Manager
Regulatory Services
British Columbia Utilities Commission
Rate Schedules 1823 and 1828 Billing Demand Interpretation for Customers
Served under Rate Schedules 1892 and 1893

For further information, please contact Shiao-Ching Chou at
bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Chris Sandve
Chief Regulatory Officer

jl/ll

Enclosure

**BC Hydro Rate Schedules 1823 and 1828
Billing Demand Interpretation for Customers
Served under Rate Schedules 1892 and 1893**

Attachment 1

Draft Order



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 1823 and 1828 Billing Demand Interpretation for Customers Served
under Rate Schedules 1892 and 1893

BEFORE:

Commissioner
Commissioner
Commissioner

on Date

ORDER

WHEREAS:

- A. On April 29, 2024, BC Hydro and Power Authority (**BC Hydro**) filed a letter with the British Columbia Utilities Commission (**BCUC** or **Commission**) to inform the BCUC of billing errors that it recently discovered that have resulted in customers being under-billed for demand under Rate Schedule (**RS**) 1823 (Transmission Service – Stepped Rate) and RS 1828 (Transmission Service – Biomass Energy Program) when those customers also receive service under RS 1892 (Transmission Service – Freshet Energy) or RS 1893 (Transmission Service – Incremental Energy Rate);
- B. In the letter, BC Hydro requested the BCUC’s consent under section 63 of the *Utilities Commission Act* (**UCA**) to charge less than specified in the applicable rate schedules due to the billing error and to not back-bill customers for any difference in RS 1823 and RS 1828 demand charges. BC Hydro also requested approval to reduce the balance of the Load Variance Regulatory Account for fiscal 2024 related to the estimated under-collected amount resulting from BC Hydro’s error, which is estimated at \$7.53 million (\$7,529,546 before rounding), which would reduce net income by the same amount in fiscal 2024;
- C. BC Hydro explained that the errors relate to incorrect billing instructions being provided when the Freshet Energy rate pilot was first implemented in 2016 and subsequent incorrect billing instructions being provided when the Incremental Energy Rate was implemented in 2020. This has resulted in under-billing for 20 unique transmission voltage customer sites between fiscal 2017 and fiscal 2024;
- D. BC Hydro explained why it is seeking consent to not back-bill customers for any difference in RS 1823 and RS 1828 demand charges. The reasons provided include that it would be difficult to objectively determine how much, if any, customers should be back-billed given that they would have changed their behaviour if

the demand charges had been applied correctly and that BC Hydro incorrectly confirmed its initial misinterpretation of the RS 1892 billing formula and confirmed subsequent changes to the RS 1892 and RS 1893 billing formulas to customers since that time;

- E. BC Hydro stated that reducing the Load Variance Regulatory Account balance related to the estimated under-collected amounts resulting from BC Hydro’s error would ensure that no ratepayers pay for these amounts;
- F. BC Hydro explained that the estimated under-collected amount of \$7.53 million (\$7,529,546 before rounding) is based on the amount of incremental demand charge revenue that might reasonably have been billable to customers taking service under RS 1892 and RS 1893 since fiscal 2017 through fiscal 2024.

NOW THEREFORE the Commission orders as follows:

- 1. BC Hydro’s request for BCUC’s consent under section 63 of the UCA to charge less than specified in the applicable rate schedules and to not back-bill customers for any difference in RS 1823 and RS 1828 demand charges is granted.
- 2. BC Hydro’s request to reduce the balance of the Load Variance Deferral Account for fiscal 2024 by the estimated under-collected amounts resulting from the billing error of \$7,529,546 is approved, which would reduce net income by \$7,529,546 in fiscal 2024.

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

BY ORDER

(X. X. last name)
Commissioner

Attachment Options

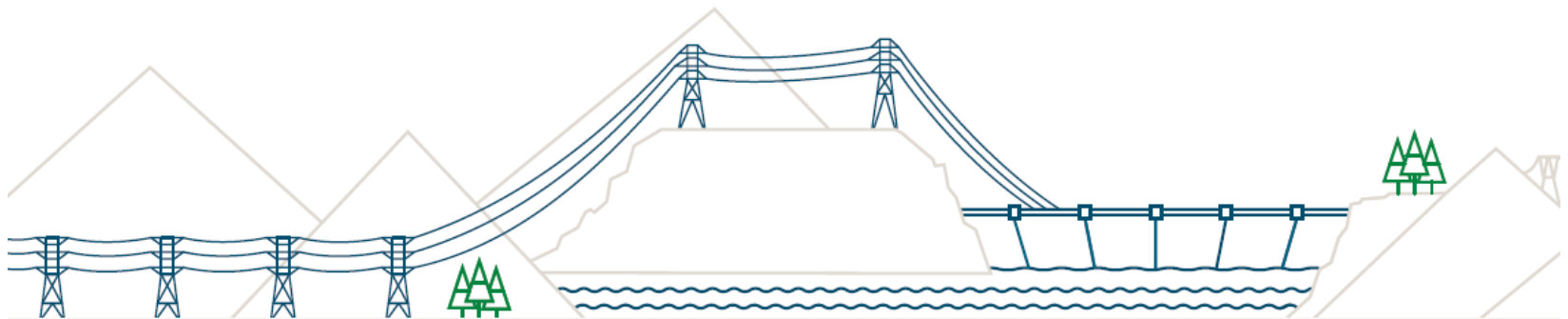
**BC Hydro Rate Schedules 1823 and 1828
Billing Demand Interpretation for Customers
Served under Rate Schedules 1892 and 1893**

Attachment 2

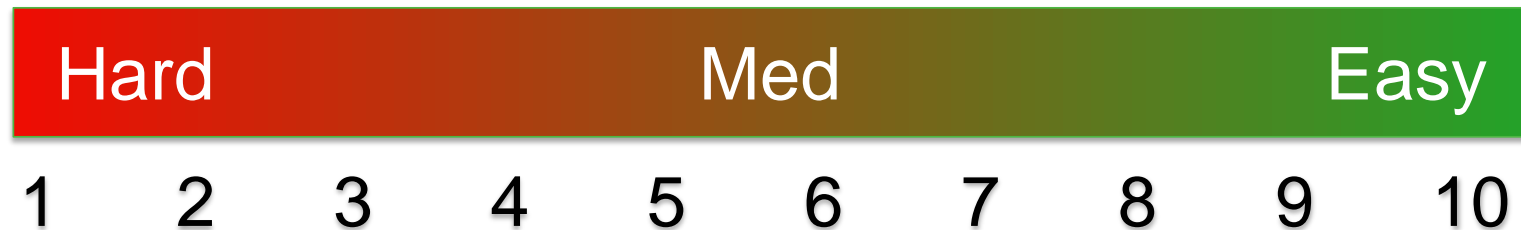
**BC Hydro Transmission Customer Workshops:
February 2016**

Transmission Service Rates Update

BC Hydro Transmission Customer Workshops: Feb 2016



How easy is it to do business with BC Hydro?



- **Where do we rank today?**
- **How can we move up the scale?**

Please provide comments via Feedback Form attached

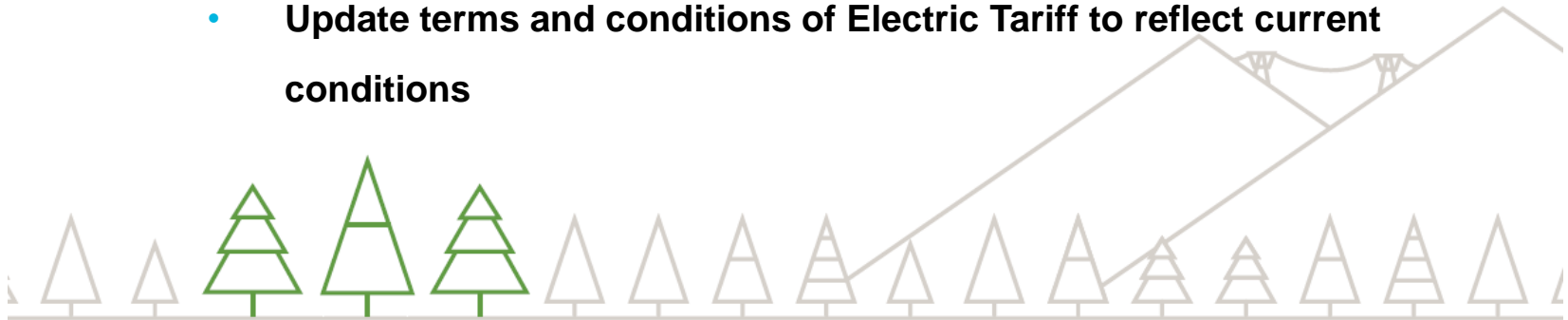
Overview:

1. 2015 Rate Design Application (background)
2. RS 1823 energy Re-pricing (proposal)
3. TS 74 Business Practices (CBL Guidelines)
4. Freshet Rate Pilot (RS 1892)



2015 Rate Design Application (RDA)

- 2015 RDA filed 25 Sep 2015 ... referred to as “Module 1”
- Last RDA was in 2007
- **Why?** Review rates and tariffs for electricity supply to all rate classes:
 - Evaluate cost of service allocation between rate classes
 - Update default rate structures and designs
 - Update terms and conditions of Electric Tariff to reflect current conditions



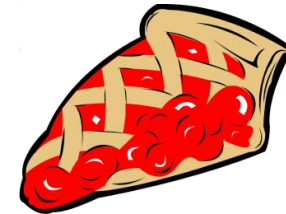
Basic Steps in Setting Rates

1. Establish the total costs that BC Hydro needs to recover in rates



“How big is the pie?”

2. Determine the share / allocation of costs between customer classes



“How big is our slice?”

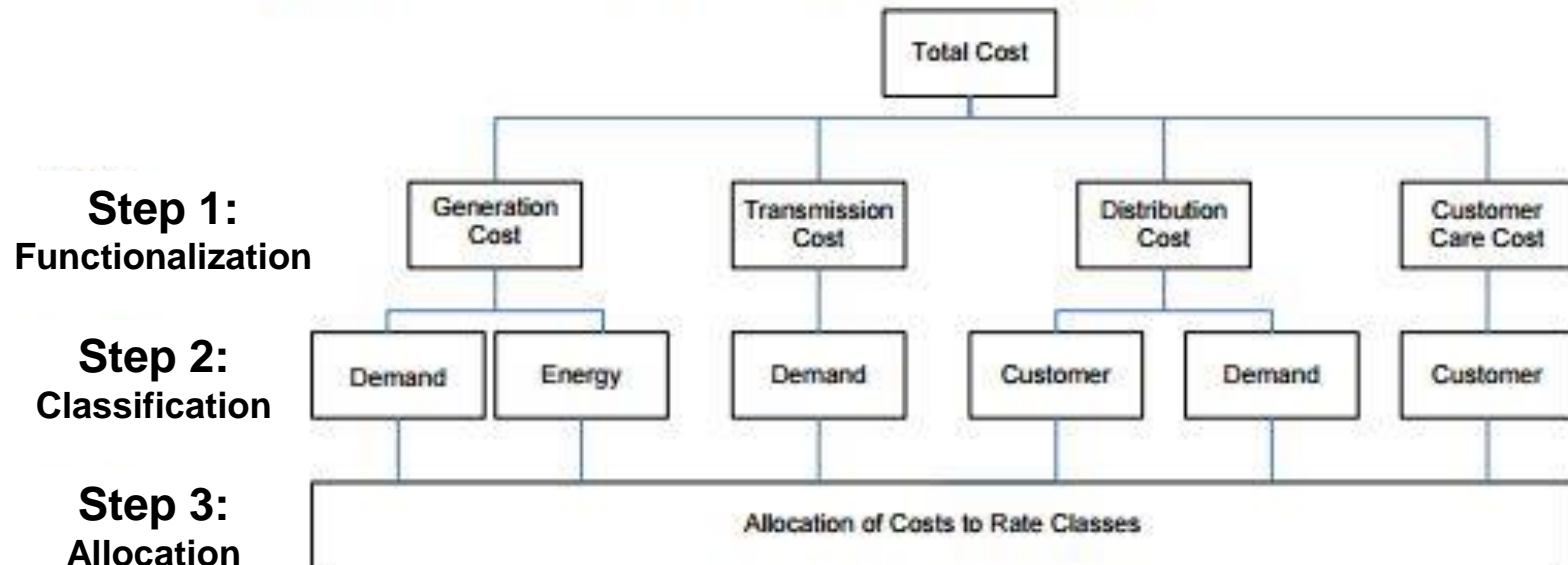
3. Design the rates to recover the costs allocated to each customer class



“What is the recipe?”

Cost allocation methodology

Figure 3-1 Cost Allocation Methodology



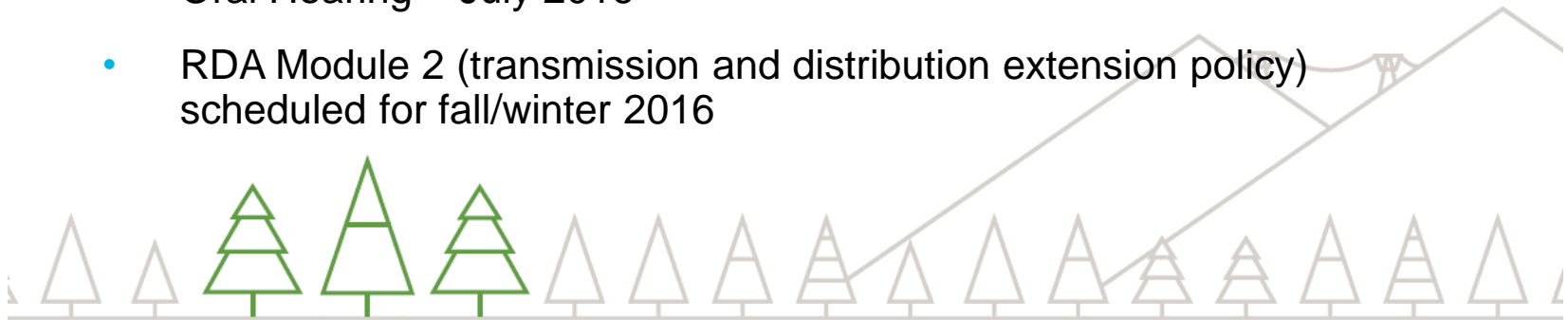
Revenue/cost ratio by customer class

Table 3-6 R/C Ratios

	R/C Ratios	
	Final F2016 COS Study results	
Rate Class	Final Study filed in the RDA (%)	Draft F2016 COS study posted to RDA website in February 2015 (%)
COLUMN	A	B
Residential	93.9	93.9
SGS	112.0	112.0
MGS	117.1	120.5
LGS	100.9	99.7
Irrigation	85.1	85.2
Street Lighting	134.1 ¹⁴⁴	134.1
Transmission	101.4	101.5
Total Classes	100.0	100.0

2015 RDA Regulatory Status/Timing:

- Written Hearing (Round 1) – completed December 2015
- **2yr Freshet Rate Pilot approved** – Order G-17-16 (09 Feb 2016)
- New MGS/LGS accounts (without historical baselines) to be placed on flat energy rate effective April 2016 – Order G-16-16 (09 Feb 2016)
- Cost of Service study and rate class segmentation to be reviewed via Negotiated Settlement - March 2016
- Written Hearing (Round 2) – March 2016
- Oral Hearing – July 2016
- RDA Module 2 (transmission and distribution extension policy) scheduled for fall/winter 2016



Transmission Service Rates: RS 1823

- RS 1823 and TS 74 (CBL Guidelines) working well ... BUT...
- Per Direction 7 (3.1) and Recommendation #8 (2003 BCUC Report): **T2 Rate should reflect LRMC (Long Run Marginal Energy Cost)**
- Current (F16) T2 price = **\$85.04/MWh**
- Forecast T2 price in F17 (increased by 4%) = **\$88.44/MWh**
- This is < lower bound LRMC price in F17 = **\$89.20/MWh**
- RDA proposal is F17 increase in T2 price to \$89.20/MWh (Option 1)
- Results in F17 decrease in T1 price to achieve revenue neutrality
- T1 price decrease almost entirely offset by F17 RRA increase

Transmission Service Rates: RS 1823

Rate Schedule 1823	F2016	F2017	F2018	F2019
	FINAL	DIR.6 RATE CAP	DIR.6 RATE CAP	DIR.6 RATE CAP
BC Hydro General Rate Increases*	6.00%	4.00%	3.50%	3.00%
Existing RS1823 Energy Charge				
RS 1823 Energy Charge A (\$/MWh)	43.03	44.75	46.31	47.70
RS 1823 Tier 1 Rate (\$/MWh)	38.36	39.89	41.29	42.53
RS 1823 Tier 2 Rate (\$/MWh)	85.04	88.44	91.53	94.28
RS1823 Demand Charge (\$/kVA)	7.340	7.634	7.901	8.138
Deferral Account Rate Rider	5.00%	5.00%	5.00%	5.00%
F2015 RDA Re-pricing (Option 1)				
RS 1823 Tier 1 Rate (\$/MWh)		39.81	41.20	42.44
RS 1823 Tier 2 Rate (\$/MWh)		89.20	92.32	95.09

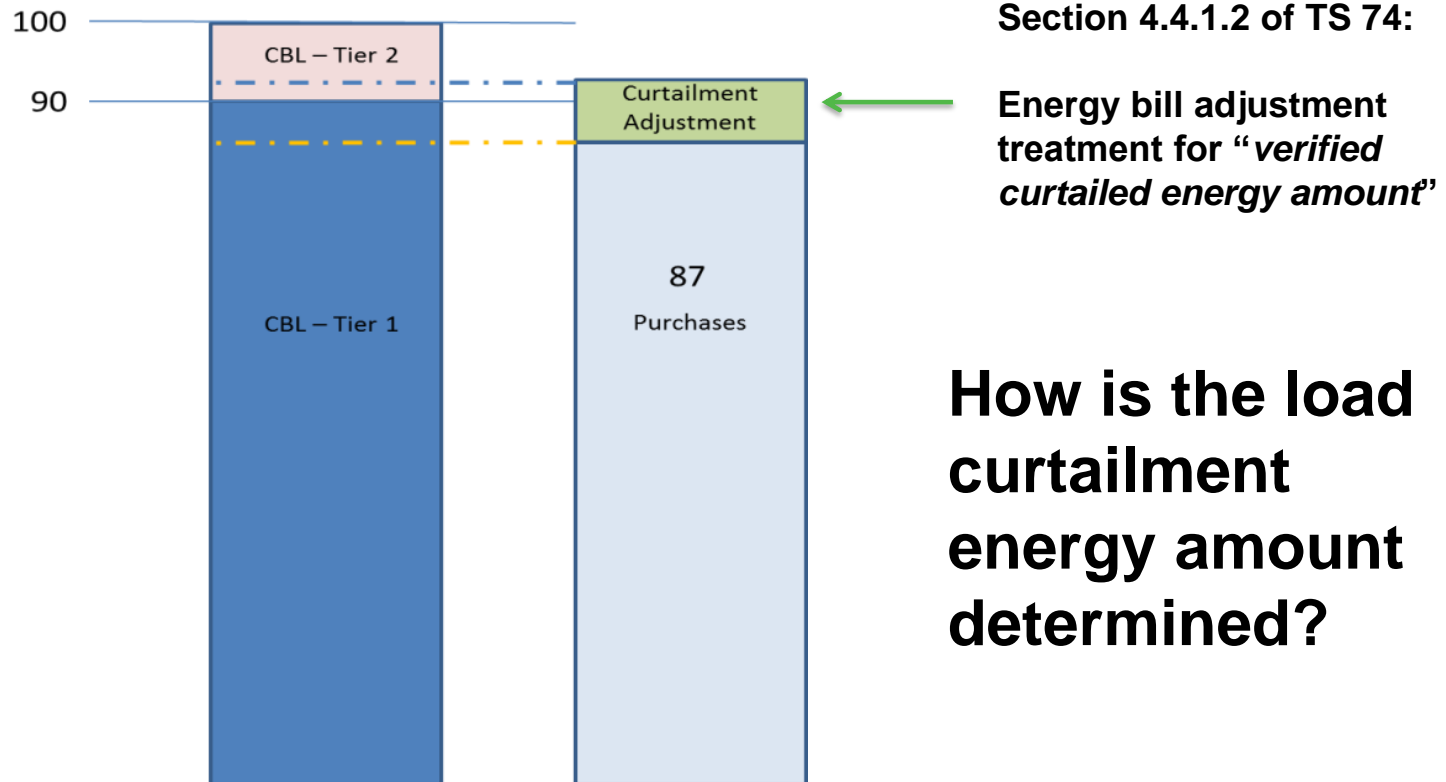


TS 74 Business Practices Update:

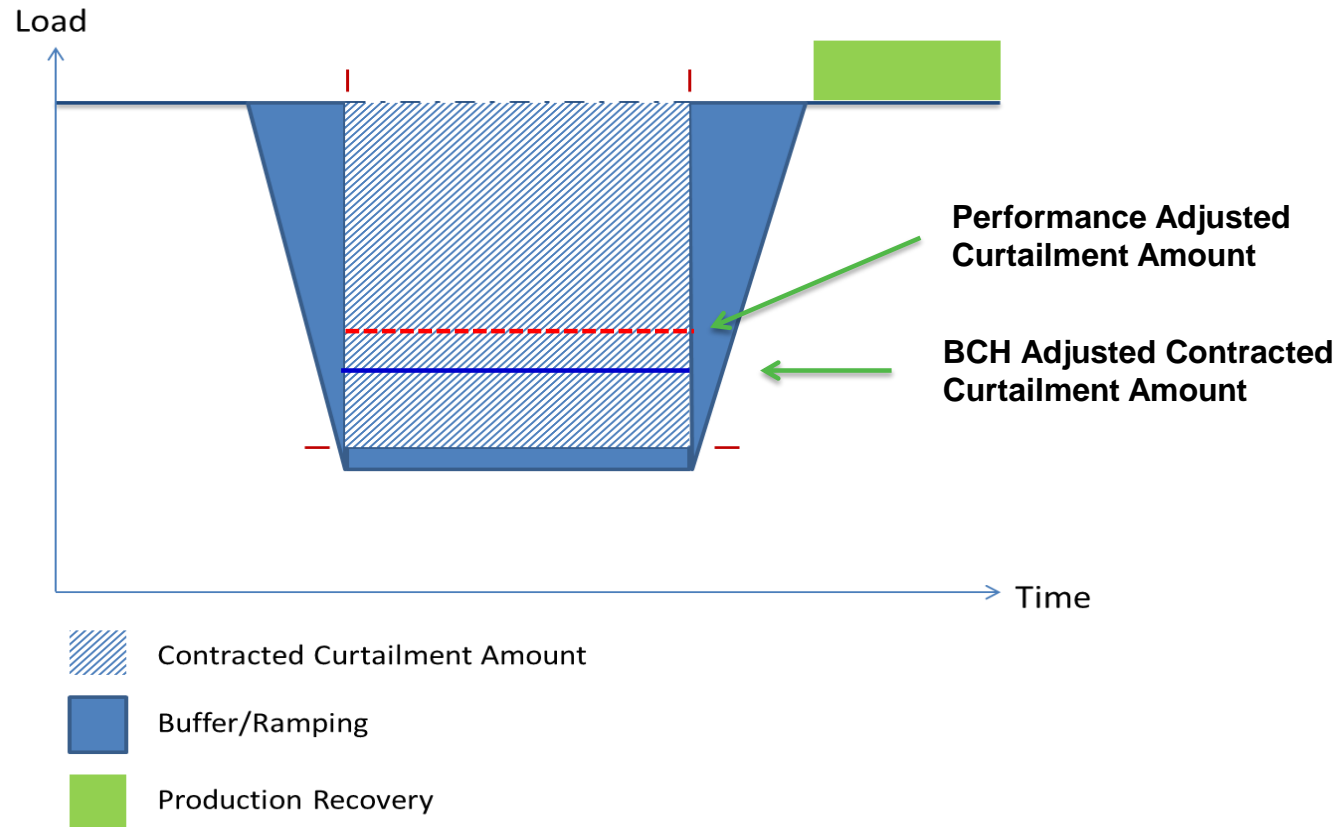
1. Energy bill adjustment treatment for BC Hydro Load Curtailment Program energy
2. Energy bill adjustment treatment for planned BC Hydro system outage energy
3. Decimal rounding practice for CBL annual reset



TS74: Load Curtailment Energy

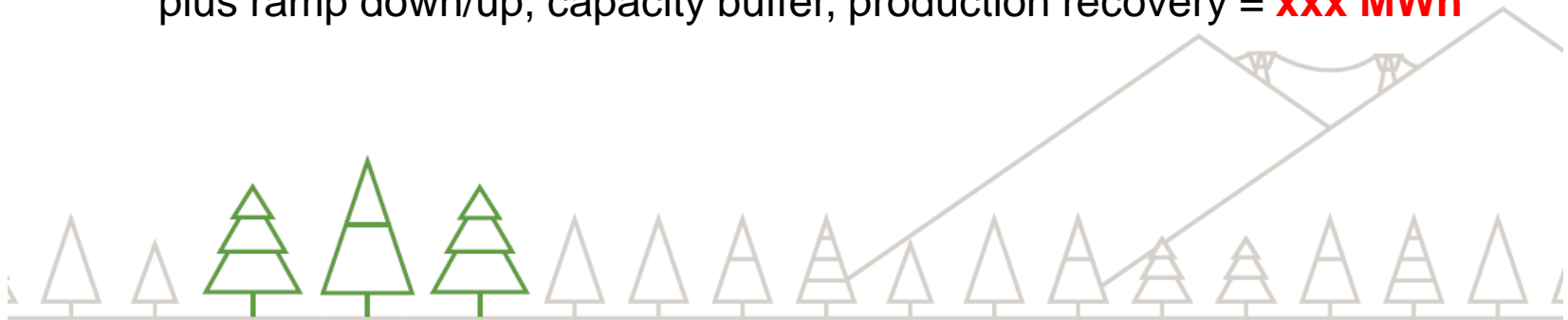


TS74: Load Curtailment Energy



TS74: Treatment Alternatives:

1. **BCH Contracted Energy:** 10 MW.hr x 576hrs of curtailment (36 events x 16hrs) = **5,760 MWh**
2. **BCH Adjusted Contracted Energy:** 10 MW.hr x 320hrs of curtailment (modified request: 20 events x 16hrs) = **3,200 MWh**
3. **Performance Adjusted Contracted Energy:** 10 MW.hr x 200hrs of curtailment (what customer actually provides) = **2,000 MWh**
4. **Net Customer Demand Response Energy:** Actual performance plus ramp down/up, capacity buffer, production recovery = **xxx MWh**



TS74: New Business Practice

Default Treatment

Performance Adjusted Contracted Energy

- Easy to understand
- Simple to verify
- No customer submission

CBL reset impact?

Net Customer Demand Response Energy

- By customer submission
- Supporting technical detail
- Engineering Review required

Note: If a customer is served under RS 1823A (i.e., no CBL) whilst also participating in the Load Curtailment program, the Non-recurring downtime provision (section 3.1.5.5 of TS 74) will be used to add back any verified curtailed energy amounts during a CBL determination period

Other TS 74 Business Practices:

Planned BC Hydro transmission system outage

- Treat as load curtailment energy under section 4.4.1.2 of TS 74
- Customer must make submission with supporting technical documentation
- BCH Engineering Review to verify energy consumption impact

Rounding practice for CBL annual reset per section 4.3 of TS 74

- Decimal place rounding using commonly accepted accounting principles
- 109.95% rounded up to 110.0% (for upper CBL reset threshold)
- 89.95% rounded up to 90.0% (for lower CBL reset threshold)

Other TSR Rate Applications:

1. Indirect Interconnection Service (TS 87 and TS 88)
2. TS 89 (Billing pro-forma for EPA customers)
3. Contracted Generation Baseline (GBL) Guidelines



Freshet Rate Pilot (RS 1892)



Freshet Rate Pilot (RS 1892)

What is it?

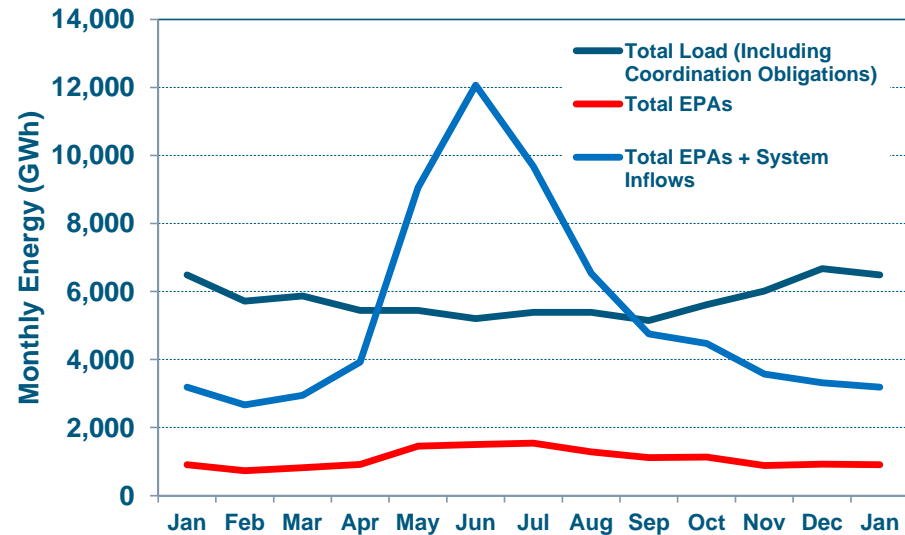
- Optional non-firm interruptible rate for existing RS 1823 customers
- Offered on 2-yr pilot basis, commencing May 2016
- Rate applies during freshet period of 01 May – 31 July (2016 and 2017)
- Market-based pricing (Mid-C) with \$0 price floor for incremental energy use; \$3/MWh wheeling fee; no demand charge

What is the “freshet” rationale?

- Aligned with government policy ... rate options for TSR customers
- Recurring issue of over-supply during freshet period
- High inflows (rain/snow), limited storage, low loads, spill risk
- Surplus energy historically sold to market at low prices

Freshet Rate

- Long-time recurring issue of energy over-supply during freshet period
- Combination of high water inflows (large hydro and run of river) and low loads
- Surplus energy typically sold to market ... spill risk if prices are negative

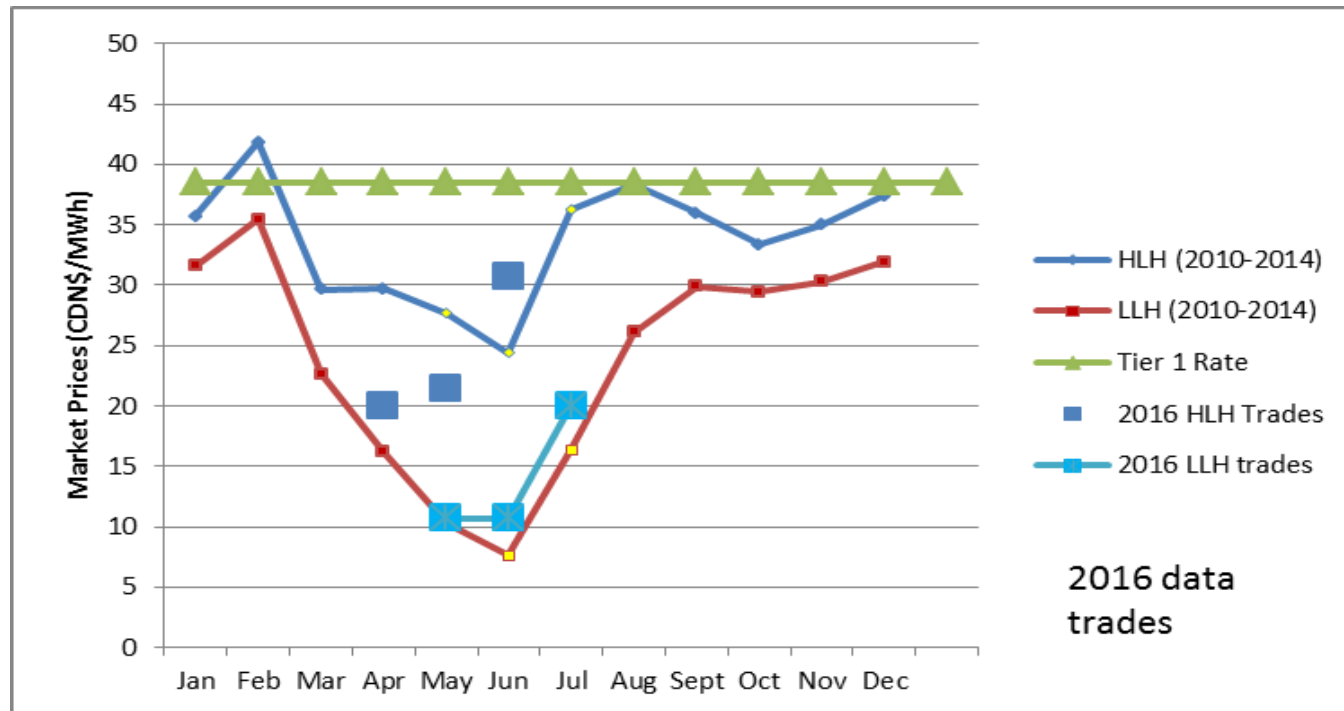


Freshet Rate

Spill at GMS: July 2012



Freshet Rate: Historical prices



- Mid-C prices typically reach annual lows during freshet period
- Historical CAD \$10-\$15/MWh margin (HLH) and CAD \$20-\$25/MWh margin (LLH) relative to RS 1823 T1 price
- Average CAD \$15/MWh margin x 2200 freshet hours = ~ \$330,000 for 10 MW of incremental load

Freshet Rate: 2016 price forecast

Mid-C Forward Price Forecast			§CAD/US Fx	0.70							
	HLH	LLH	FLAT	HLH	LLH	FLAT	WHEELING	RS1823	RS1823	TOTAL	
Month	US\$/MWh	US\$/MWh	US\$/MWh	CAD\$/MWh	CAD\$/MWh	CAD\$/MWh	CAD \$3/MWh	T1 Rate \$/MWh	Demand \$/MWh equiv.	RS1823 \$/MWh	
Jan-16	17.00	16.50	16.79	24.29	23.57	23.99					
Feb-16	19.75	18.25	19.11	28.21	26.07	27.30					
Mar-16	16.75	14.25	15.70	23.93	20.36	22.43					
Apr-16	14.75	10.25	12.85	21.07	14.64	18.36					
May-16	13.75	6.50	10.40	19.64	9.29	14.86	17.86	40.00	13.00	53.00	
Jun-16	14.75	6.50	11.27	21.07	9.29	16.10	19.10	40.00	13.00	53.00	
Jul-16	22.00	14.25	18.42	31.43	20.36	26.31	29.31	40.00	13.00	53.00	
Aug-16	26.25	19.75	23.52	37.50	28.21	33.60					
Sep-16	25.25	20.00	22.92	36.07	28.57	32.74					
Oct-16	23.50	20.00	21.96	33.57	28.57	31.37					
Nov-16	24.25	21.25	22.91	34.64	30.36	32.73					
Dec-16	28.75	24.75	26.99	41.07	35.36	38.56					
Jan-17	28.25	24.50	26.52	40.36	35.00	37.89					

Freshet Rate: How it works

1

Set freshet period reference baselines for energy (HLH and LLH) and demand

2

Electricity below baselines is billed under RS 1823 (energy and demand)

3

Electricity above baselines is billed at Mid-C market prices (energy) + wheeling fee (delivery)

Freshet Rate: How increase load?

GOAL

Achieve net gain in energy consumption across each freshet period (2016 / 2017) relative to 2015 Freshet Energy Baselines

WHAT CAN I DO?

- Invest in new production capacity
- Optimize use of existing production capacity
- Change grades / energy intensive product
- Turn down self-generation
- Shift winter loads to freshet period
- Shift loads from HLH to LLH during freshet period
- Consider timing of plant and generator maintenance



Freshet Rate: Energy Baselines

	6am – 10pm, Mon-Sat	10pm – 6am, Mon-Sat Sunday + public holidays
FRESHET ENERGY BASELINE DETERMINATION	HLH	LLH
MAY 2015 (744 hrs)	3,000 MWh	2,500 MWh
JUNE 2015 (720 hrs)	3,000 MWh	2,500 MWh
JULY 2015 (744 hrs)	4,000 MWh	3,000 MWh
TOTAL ENERGY:	10,000 MWh	8,000 MWh
TOTAL HOURS:	1,264 hrs	944 hrs
HOURLY BASELINE:	7.9 MW.hr	8.5 MW.hr

For simplicity, calendar 2015 freshet energy consumption will be used for baseline determination, with no adjustment, provided purchases are deemed to be “normal” (+/-10% of historical load)

Freshet Rate: Demand Baseline

MAY 2015 BILLING DEMAND 8,000 kVA

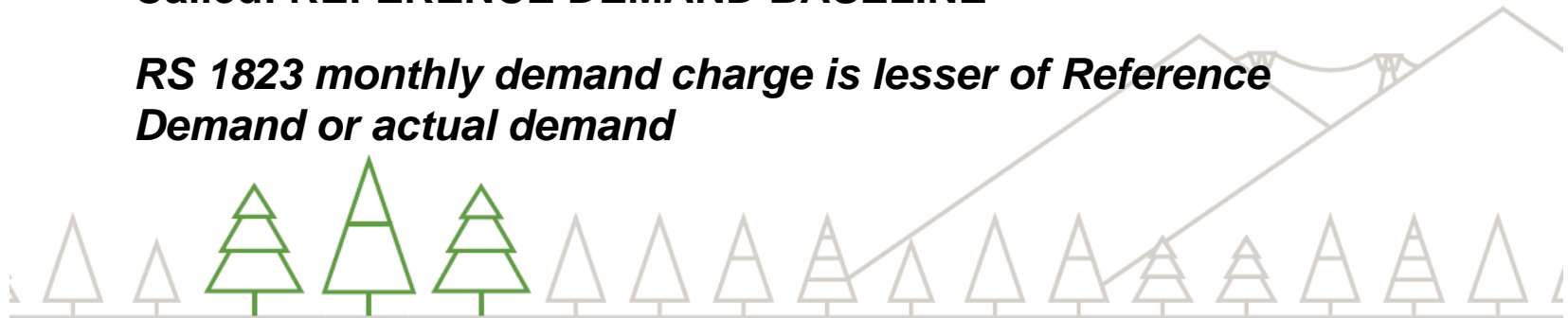
JUNE 2015 BILLING DEMAND 8,500 kVA

JULY 2015 BILLING DEMAND 9,000 kVA

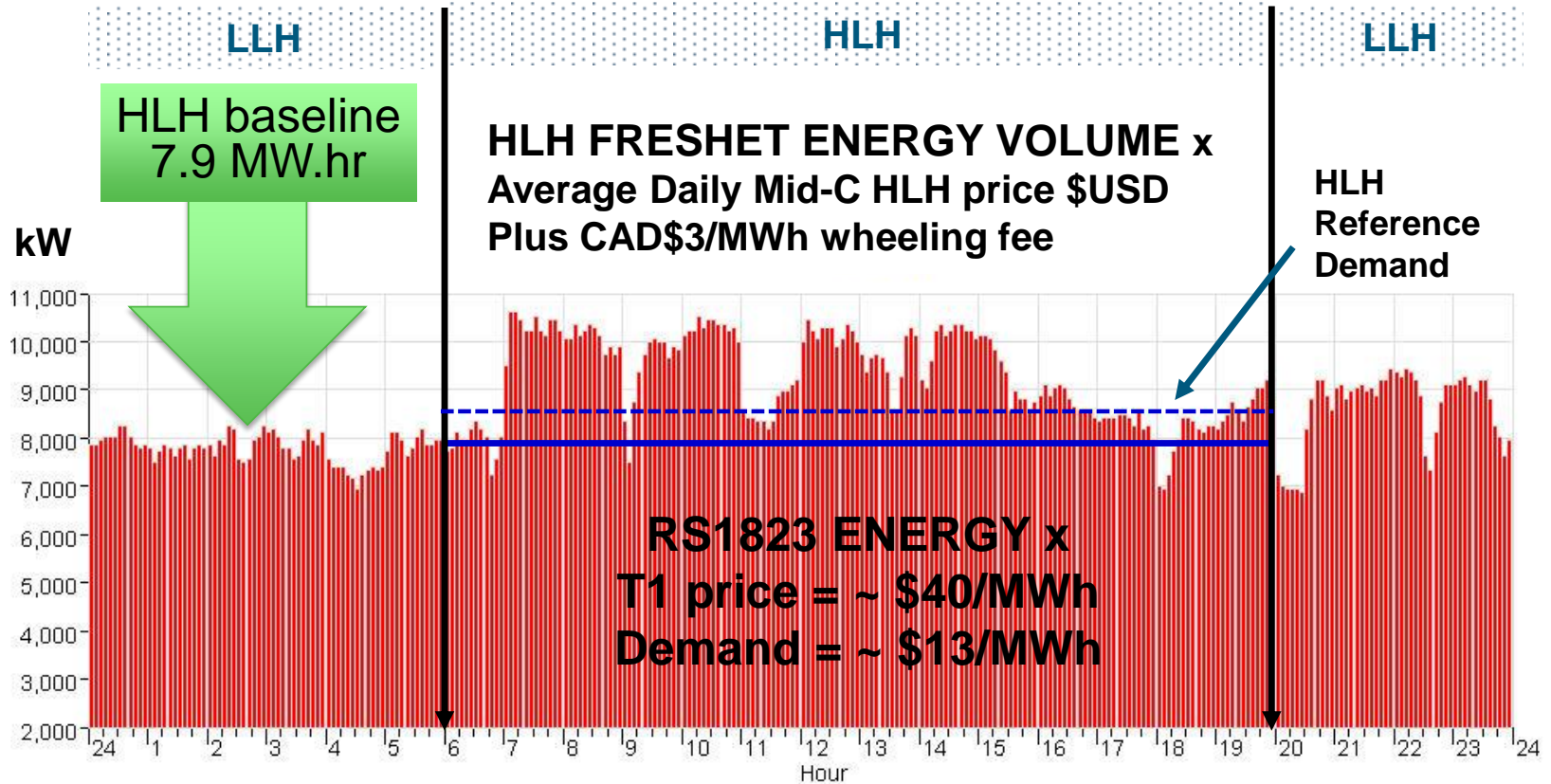
AVERAGE DEMAND **8,500 kVA**

Called: REFERENCE DEMAND BASELINE

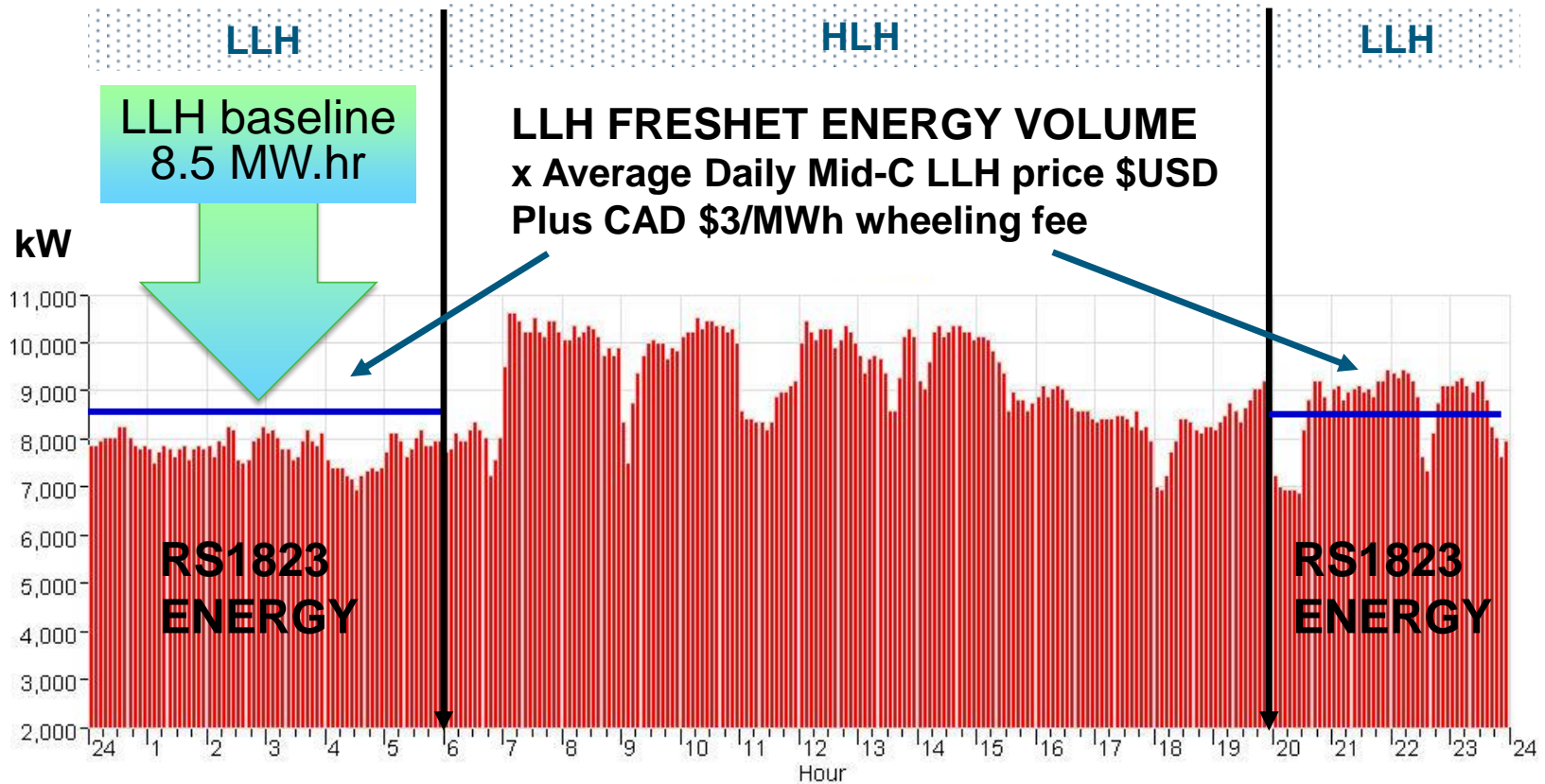
RS 1823 monthly demand charge is lesser of Reference Demand or actual demand



Freshet Rate: Illustrative Day (HLH)



Freshet Rate: Illustrative Day (LLH)



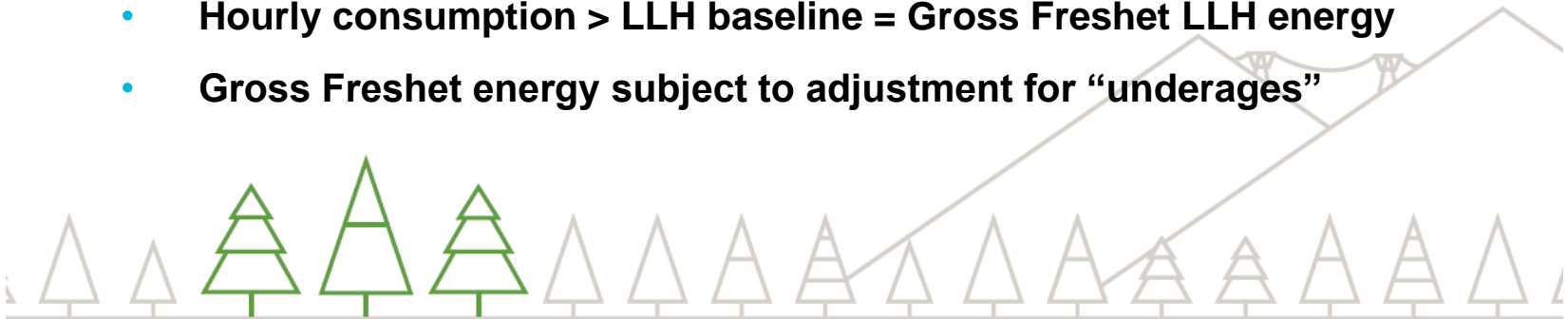
Freshet Rate Pilot: Energy Billing

RS 1823 Energy (billed in May, June, July)

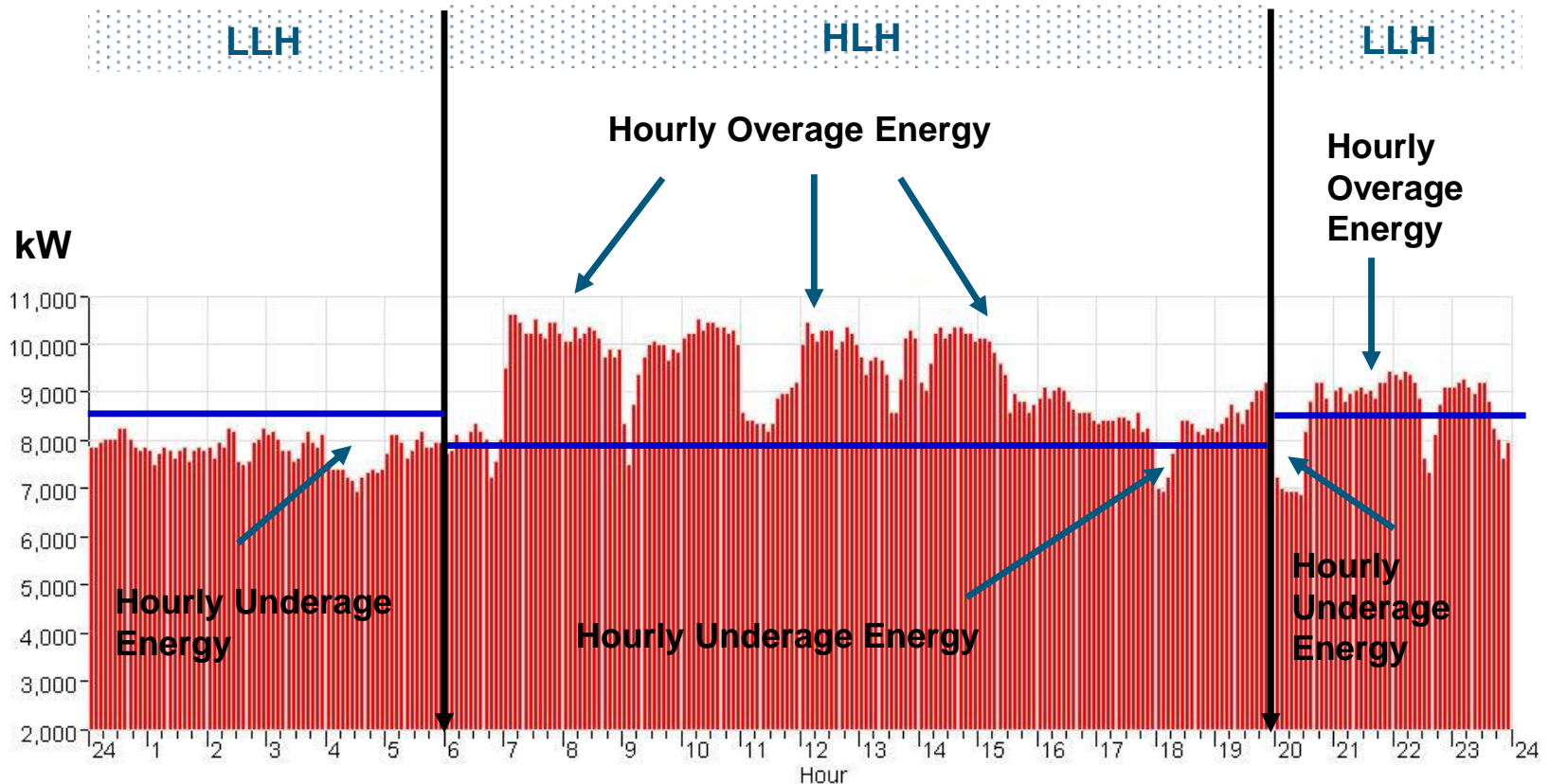
- Hourly consumption < HLH baseline = RS 1823 HLH energy
- Hourly consumption < LLH baseline = RS 1823 LLH energy
- Monthly RS 1823 energy bill = sum of RS 1823 HLH and LLH energy

RS 1892 Freshet Energy (billed in August)

- Hourly consumption > HLH baseline = Gross Freshet HLH energy
- Hourly consumption > LLH baseline = Gross Freshet LLH energy
- Gross Freshet energy subject to adjustment for “underages”



Freshet Rate: Energy reconciliation

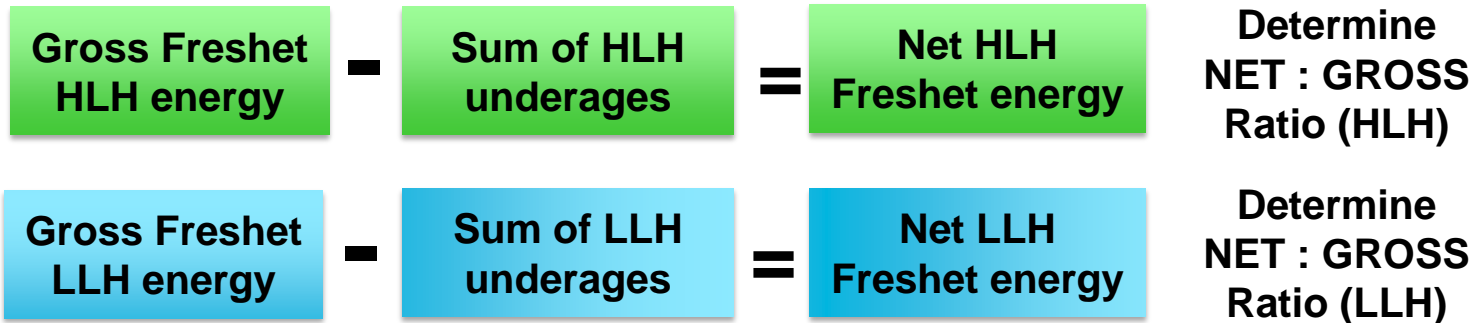


Sum of Hourly Overage Energy > HLH Baseline = Gross HLH Freshet Energy

Sum of Hourly Overage Energy > LLH Baseline = Gross LLH Freshet Energy

31

Freshet Rate: August Reconciliation



Step 1: Determine daily volume of Gross Freshet energy (for HLH and LLH)

Step 2: Adjust volumes of Daily Gross Freshet energy by Net:Gross ratio

Step 3: Multiply adjusted (net) freshet energy x Daily Mid-C price in \$USD

Step 4: Convert \$USD to \$CAD using daily Bank of Canada spot rate

Step 5: Add delivery fee of CAD\$3/MWh to Freshet energy volume for period

Step 6: Re-bill for total underage energy during period under RS 1823

Freshet Rate: How to participate

Customer:

- Provide written notice of intent to participate by 01 March 2016
- Send email or letter to your Key Account Manager
- Provide estimate of prospective incremental load (MW and/or MWh)
- Describe prospective actions to achieve incremental load

BC Hydro:

- Review calendar 2015 and historical Freshet Period consumption
- Prepare HLH and LLH energy and reference demand baselines
- Review baselines with customer / adjust as applicable
- Finalize baselines with customer / file adjusted baselines with BCUC
- Make arrangements to provide customer with daily ICE* pricing information

**ICE refers to “Intercontinental Exchange” price report ... Average daily forward Mid-C price (per ICE) will be used for settlement*

Freshet Rate: The fine print

Terms and conditions:

- Customers with generation ... RS 1880 request during Freshet Period is automatic trigger to cancel RS 1892 service
- **Customer can cancel RS 1892 service at any time up to 31 July in a given Freshet Period with written notice**
- Cancellation of RS 1892 service means all electricity will be billed under RS 1823
- Mid-C pricing is based on the published ICE (Intercontinental Exchange) Day Ahead Power Price Report in \$USD
- Wheeling fee is a fixed flat rate of CAD \$3/MWh on billed Freshet energy volumes (i.e., same rate applies in both HLH and LLH)
- Deferral Account Rate Rider (5%) and taxes apply

**BC Hydro Rate Schedules 1823 and 1828
Billing Demand Interpretation for Customers
Served under Rate Schedules 1892 and 1893**

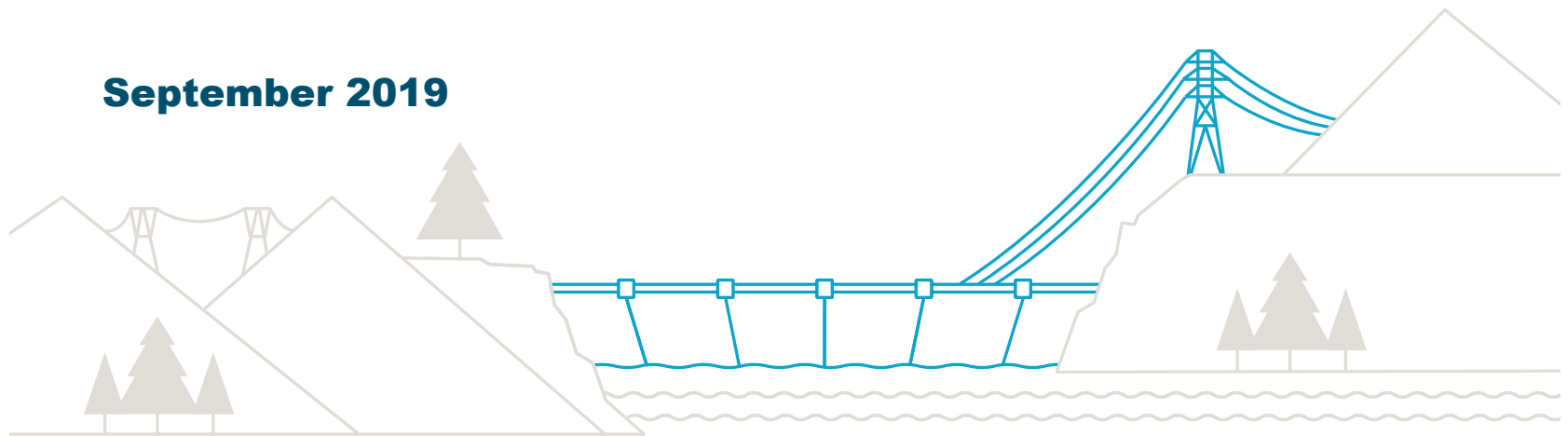
Attachment 3

**BC Hydro Transmission Service Rates Update
TSR Customer Workshop: September 2019**

BC Hydro Transmission Service Rates Update

TSR Customer Workshop

September 2019



Agenda

Workshop Agenda

8:00 am	-	8:45 am	Registration and continental breakfast
8:45 am	-	9:15 am	Introduction and BC Hydro update
9:15 am	-	9:30 am	Freshet Rate (RS 1892) Permanent Rate Application
9:30 am	-	10:15 am	Incremental Energy Rate (RS 1893) Pilot Review
10:15 am	-	10:30 am	Break
10:30 am	-	11:15 am	Indirect Service/Resale Supply options and TSR Business Practices
11:15 am	-	12:00 pm	Proposed TS 74 Amendments
12:00 pm	-	1:00 pm	Closing, lunch, and networking

General Rates Update

- F2019 operating highlights
- F2020/21 Revenue Requirement Application
- Updated 5yr rates forecast and electricity pricing
- Biomass Energy Program / New RS 1828



F2019 OPERATING HIGHLIGHTS

OPERATING STATISTICS

for the years ended or as at March 31

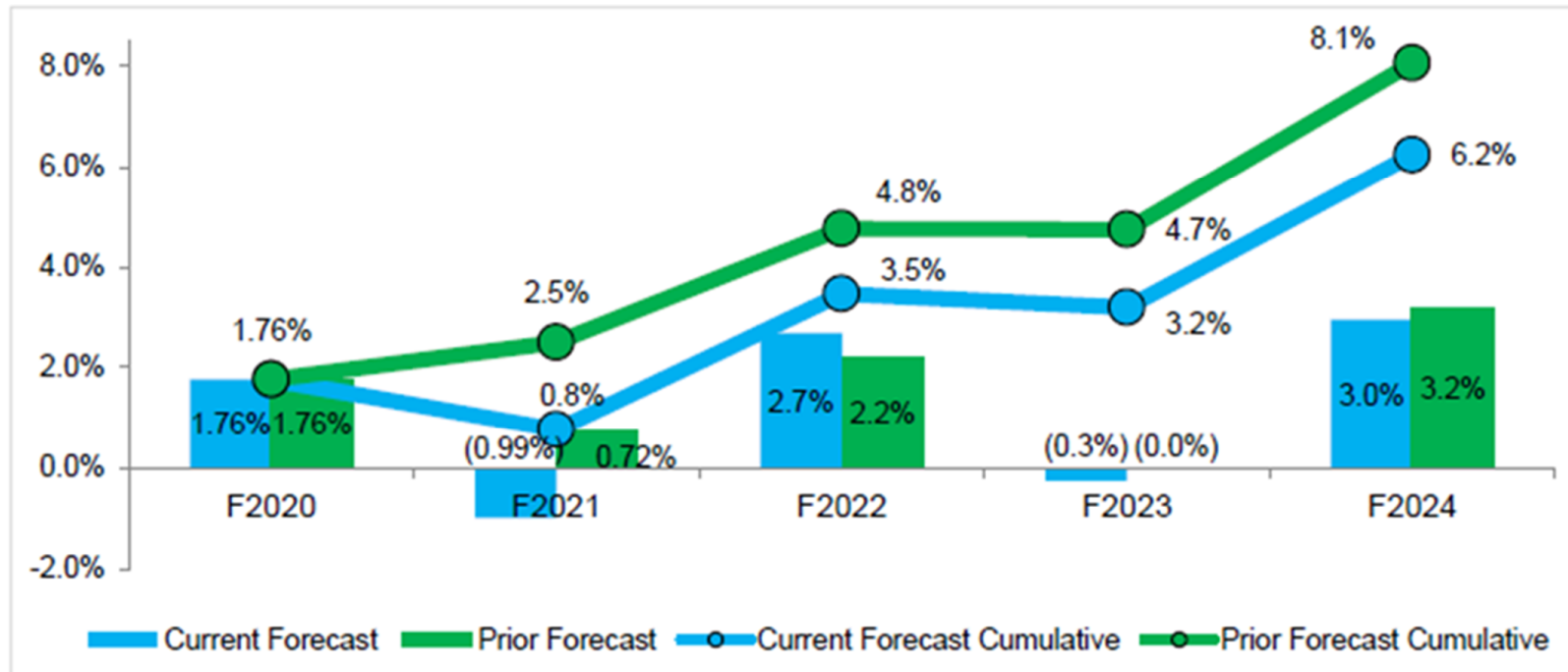
	2019	2018	2017	2016	2015
Generating Capacity (megawatts)					
Hydroelectric	11,932	11,918	11,870	11,869	11,379
Thermal	177	180	183	175	1,120
Total	12,109	12,098	12,053	12,044	12,499
Peak One-Hour Integrated System Demand (megawatts)	10,045	9,651	10,194	9,602	9,441
Number of Customer Accounts					
Residential	1,833,097	1,803,752	1,776,503	1,751,296	1,727,945
Light industrial and commercial	212,446	210,673	207,802	205,615	203,466
Large industrial	195	190	191	185	183
Other	3,419	3,429	3,467	3,459	3,474
Trade	165	182	204	214	226
Total	2,049,322	2,018,226	1,988,167	1,960,769	1,935,294
Domestic Electricity Sold (gigawatt-hours)					
Residential	18,000	18,150	18,068	17,331	17,047
Light industrial and commercial	19,007	18,874	18,968	18,421	18,564
Large industrial	13,896	13,440	13,177	13,669	14,020
Surplus Sales	2,230	5,072	5,756	6,277	14
Other sales	1,510	1,637	1,683	1,602	1,568
Total	54,643	57,173	57,652	57,300	51,213

F2020/21 REVENUE REQUIREMENTS

- **Application filed February 25, 2019 ... Proposed:**
 - Rate increase of 6.85% in F2020
 - Rate increase of 0.72% in F2021
 - Reduce Deferral Account Rate Rider to 0%
- **For F2020 (current rates), Commission approved interim rate increase of 6.85% and reduction of DARR to 0%**
- **2 rounds of written information requests (~ 3,400 in total)**
 - Round 1 responses – filed June 6th, 2019
 - Round 2 responses – filed September 3rd, 2019
- **Evidentiary Update filed August 22nd, 2019 ... Proposed:**
 - Maintain rate increase of 6.85% in F2020
 - Rate decrease of **(0.99%)** in F2021

F2020/21 REVENUE REQUIREMENTS

Figure 1 Five Year Net Bill Increases Forecast



Source: BC Hydro Evidentiary Update dated 22 August 2019, Figure 1.

RS 1823 PRICES* PER ORIGINAL RRA FILING

*Assumes RS 1823A energy, 85% load factor, unity power factor

Rate Schedule 1823 Pricing	F2019	F2020	F2021	F2022	F2023	F2024	cumulative
	FINAL	INTERIM	PROPOSED	FORECAST	FORECAST	FORECAST	
General Rate Increases	3.00%	6.85%	0.72%	2.20%	0.00%	3.20%	13.0%
RS 1823 Energy Charges							
RS 1823 Energy Charge A (\$/MWh)	47.71	50.98	51.35	52.47	52.47	54.15	
RS 1823 Energy Charge B: Tier 1 Rate (\$/MWh)	42.44	45.35	45.67	46.68	46.68	48.17	
RS 1823 Energy Charge B: Tier 2 Rate (\$/MWh)	95.09	101.60	102.34	104.59	104.59	107.93	
RS 1823 Demand Charge (\$/kVA)	8.138	8.695	8.758	8.951	8.951	9.237	
Deferral Account Rate Rider	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Differential between Tier 1 and RS1823A (\$/MWh)	5.27	5.63	5.67	5.80	5.80	5.98	
Bill Estimator							
	F2019	F2020	F2021	F2022	F2023	F2024	
Average RS 1823 Unit Cost (\$/MWh)	60.82	64.99	65.45	66.89	66.89	69.03	13.5%
Average Unit Cost + Rate Rider (\$/MWh)	63.86	64.99	65.45	66.89	66.89	69.03	8.1%
PST	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
GST	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	
Average Unit Cost incl. taxes (\$/MWh)	69.29	68.24	68.73	70.24	70.24	72.49	4.6%

DISCLAIMER:

- Forecast rates for period F2020 - F2024 are for illustrative purposes only and remain subject to BCUC review and approval
- Average unit electricity costs reflect assumptions shown above - individual circumstances will vary
- Users of this information are responsible to verify their own estimates

RS 1823 PRICES* PER EVIDENTIARY UPDATE

*Assumes RS 1823A energy, 85% load factor, unity power factor

Rate Schedule 1823 Pricing	F2019	F2020	F2021	F2022	F2023	F2024	cumulative
	FINAL	INTERIM	PROPOSED	FORECAST	FORECAST	FORECAST	
General Rate Increases	3.00%	6.85%	-0.99%	2.70%	-0.30%	3.00%	11.3%
Existing RS1823 Energy Charge							
RS 1823 Energy Charge A (\$/MWh)	47.71	50.98	50.47	51.84	51.68	53.23	
RS 1823 Tier 1 Rate (\$/MWh)	42.44	45.35	44.90	46.11	45.97	47.35	
RS 1823 Tier 2 Rate (\$/MWh)	95.09	101.60	100.60	103.31	103.00	106.09	
RS1823 Demand Charge (\$/kVA)	8.138	8.695	8.609	8.842	8.815	9.080	
Deferral Account Rate Rider	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Differential between Tier 1 and RS1823A (\$/MWh)	5.27	5.63	5.58	5.73	5.71	5.88	
Bill Estimator	F2019	F2020	F2021	F2022	F2023	F2024	
Average RS 1823 Unit Cost (\$/MWh)	60.82	64.99	64.34	66.08	65.88	67.86	11.6%
Average Unit Cost + Rate Rider (\$/MWh)	63.86	64.99	64.34	66.08	65.88	67.86	6.3%
PST	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
GST	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	
Average Unit Cost incl. taxes (\$/MWh)	69.29	68.24	67.56	69.38	69.18	71.25	2.8%

DISCLAIMER:

- Forecast rates for period F2020 - F2024 are for illustrative purposes only and remain subject to BCUC review and approval
- Average unit electricity costs reflect assumptions shown above - individual circumstances will vary
- Users of this information are responsible to verify their own estimates

BIOMASS ENERGY PROGRAM

25%

Electricity generation from Independent Power Producers accounts for ~ 25% of BC Hydro's energy supply

17%

Biomass EPAs account for ~ 17% of IPP supply mix

19

Of the 131 EPAs held by BC Hydro, 19 are with biomass generating facilities

7

7 of these 19 EPAs are due to expire in next 3 years (i.e., prior to 31 Mar 2022) ... **5 EPAs are with TSR customers**



Transitory: Biomass Energy Program

Biomass Energy Program is a cost and volume limited, transitory measure intended to allow time for the forest sector to develop new product lines (e.g., biofuels)

Long Term: Biofuel Development Program

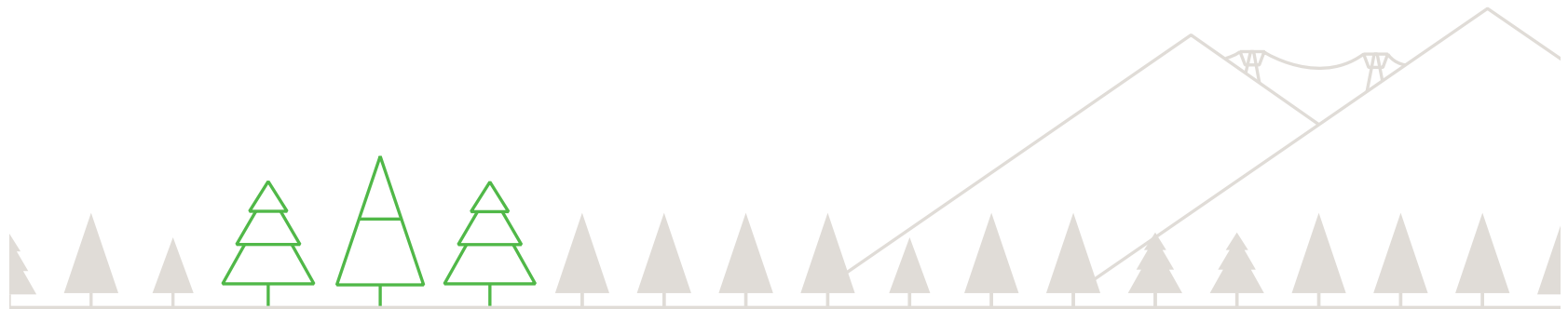
NEW RATE SCHEDULE 1828

- Pursuant to Order in Council #158 dated 01 Apr 2019
- Approved by BCUC Order G-87-19 dated 24 Apr 2019
- Specific to Biomass Energy Program customers only
- Energy price based on 5yr historical Tier 1 / Tier 2 mix
- **Results in site-specific flat energy rate for participants**

HISTORICAL ENERGY MIX	F2014	F2015	F2016	F2017	F2018		
Biomass EPA Customer xx						5YR TOTALS	TIERED %
Energy CBL (MWh)	500,000	500,000	500,000	500,000	500,000		
Annual RS 1823 energy (MWh)	480,000	470,000	460,000	450,000	450,000	2,310,000	
RS 1823 Tier 1 energy (MWh)	450,000	450,000	450,000	450,000	450,000	2,250,000	97.40%
RS 1823 Tier 2 energy (MWh)	30,000	20,000	10,000	-	-	60,000	2.60%
F2020 ENERGY PRICE EXAMPLE	RS 1823		RS 1828				
	(\$/MWh)		(\$/MWh)				
RS 1823 Tier 1 energy rate	\$ 45.35	97.40%	\$ 44.17				
RS 1823 Tier 2 energy rate	\$101.60	2.60%	\$ 2.64				
RS 1828 energy rate			\$ 46.81				

Rate Design Refresher

- Rate design considerations
- Engagement principles



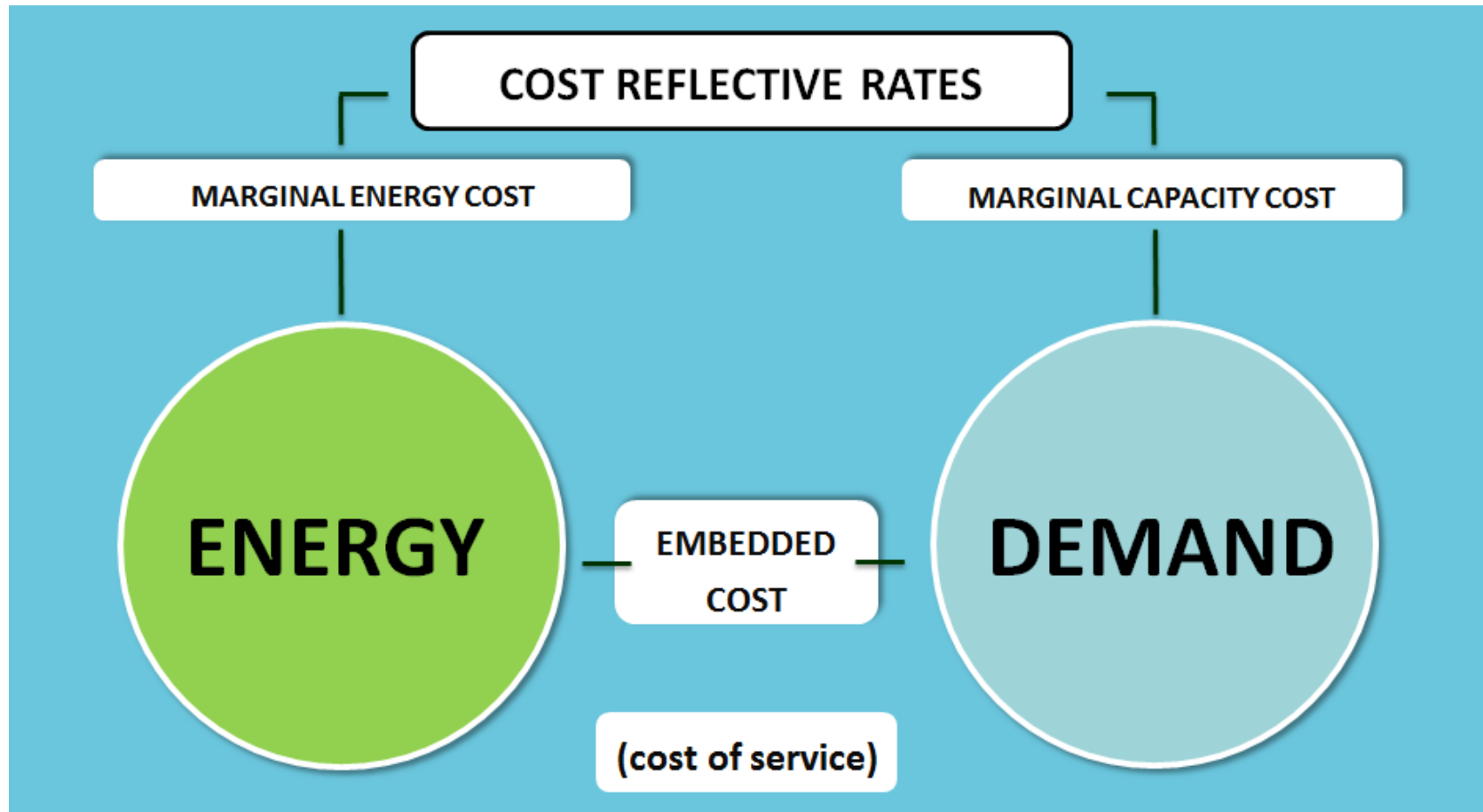
KEY RATE DESIGN PRINCIPLES

- 1. No Harm:** Ratepayers are no worse or better off (*participants and non-participants*)
- 2. No Undue Discrimination:** (*rates are fair, cost reflective, free from controversy*)
- 3. Rates are practical to implement and accepted by customers:** (*simple, pragmatic, match customer needs*)

“Simplicity is the ultimate sophistication.”

- Leonardo Da Vinci

RATE DESIGN CONSIDERATIONS



MARKET REFERENCE-PRICED RATE DESIGNS



ICE Index
Mid-C day
ahead price

Send efficient price signals to increase energy use

Plus price adders

Recover the marginal cost of service

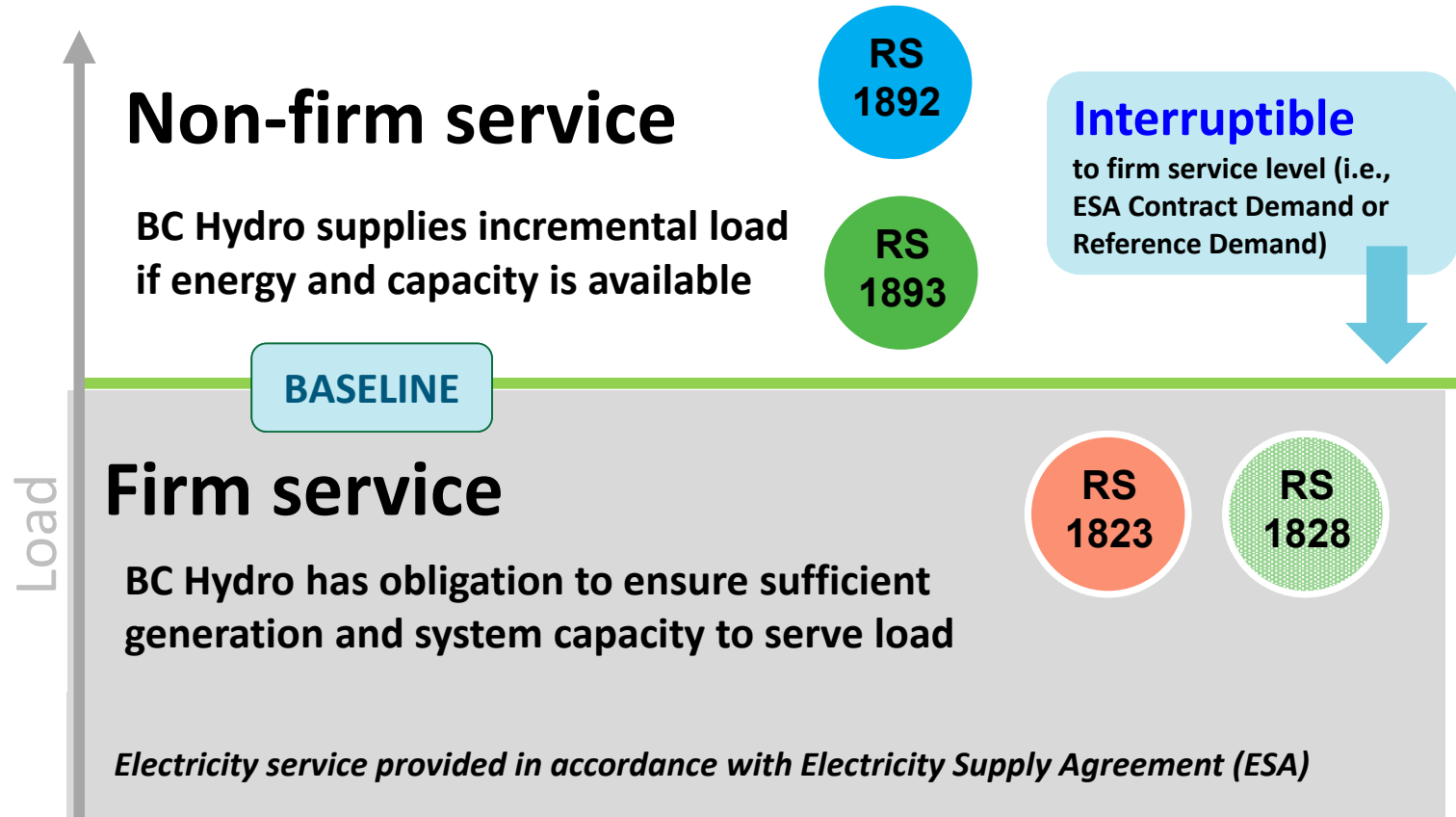
RS
1892

Freshet
Rate

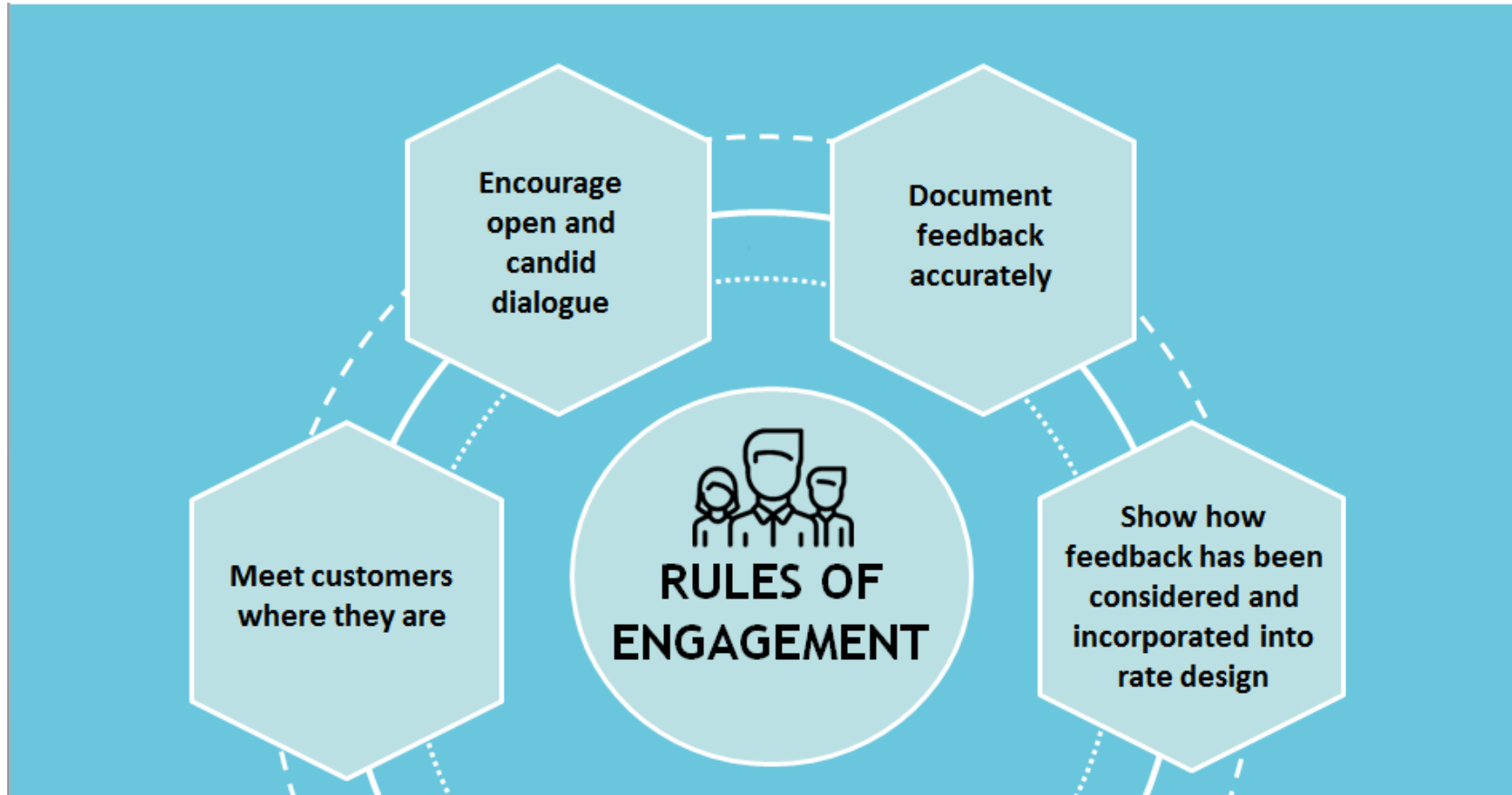
RS
1893

Incremental
Energy Rate

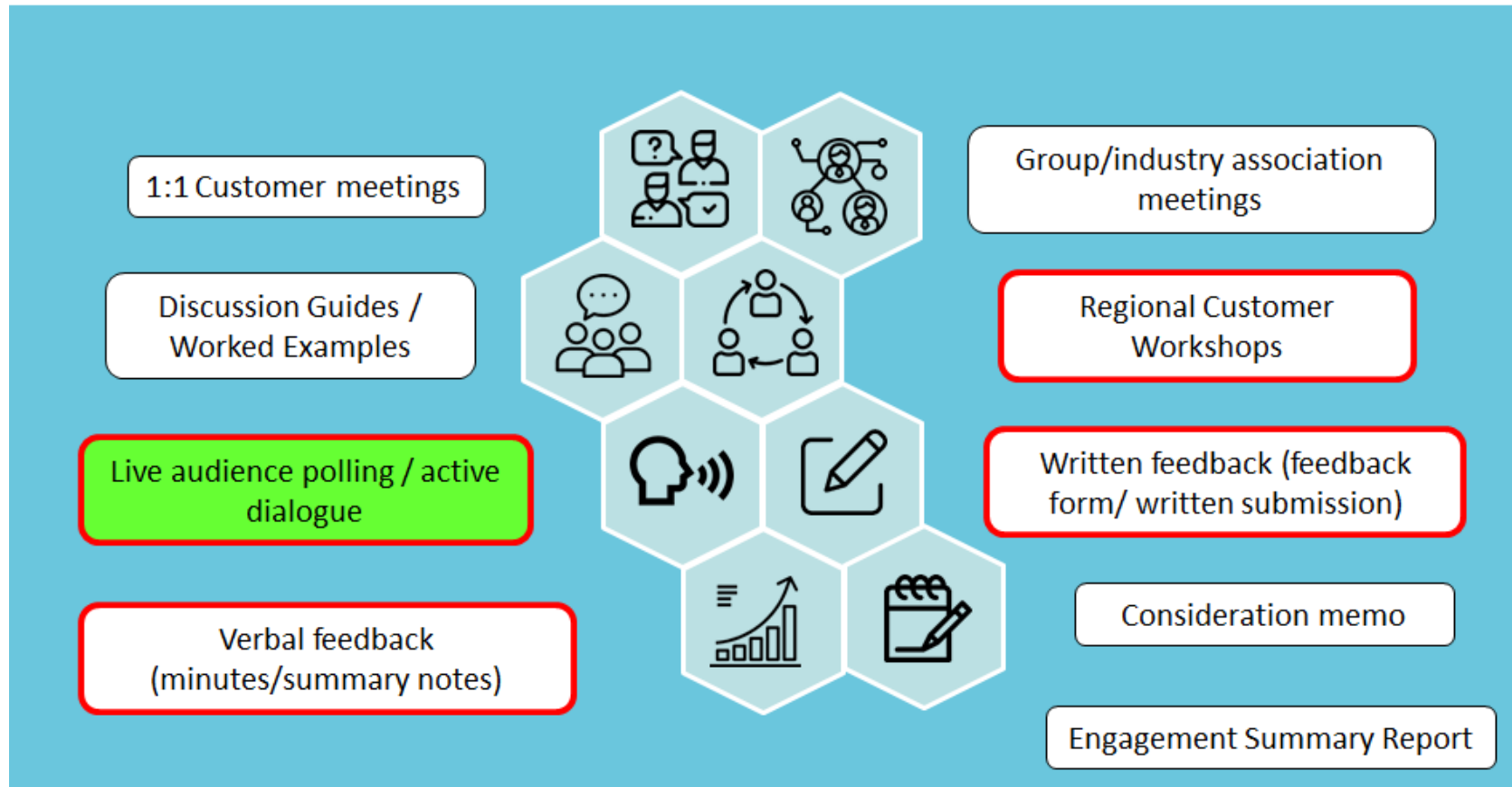
ELECTRICITY SERVICE CHARACTERISTICS

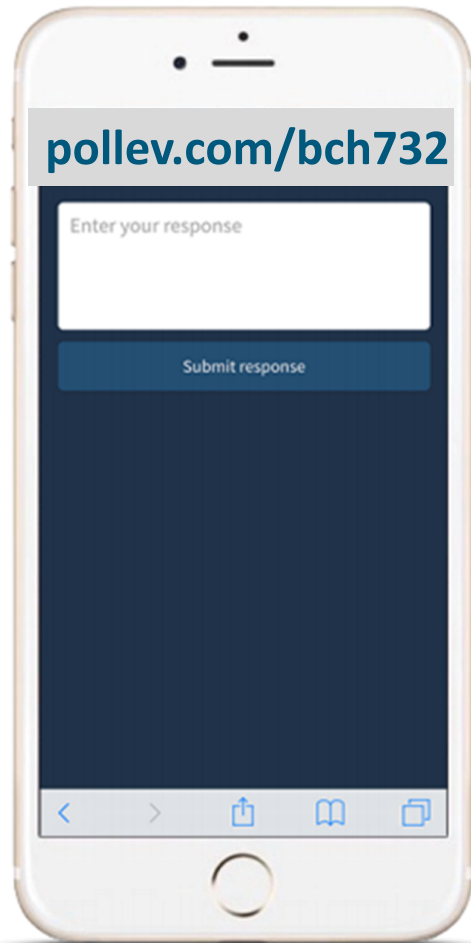


MEANINGFUL CUSTOMER ENGAGEMENT



OUR ENGAGEMENT APPROACH





POLL EVERYWHERE INSTRUCTIONS

1. Please take out your phone or tablet
2. Please participate by visiting the URL:
pollev.com/bch732 from any web browser
3. You don't need to download anything
4. Please enter initials in the name field
5. Wait for the question to appear and respond with a tap

In your view, should non-firm electricity service be priced higher or lower than firm service?

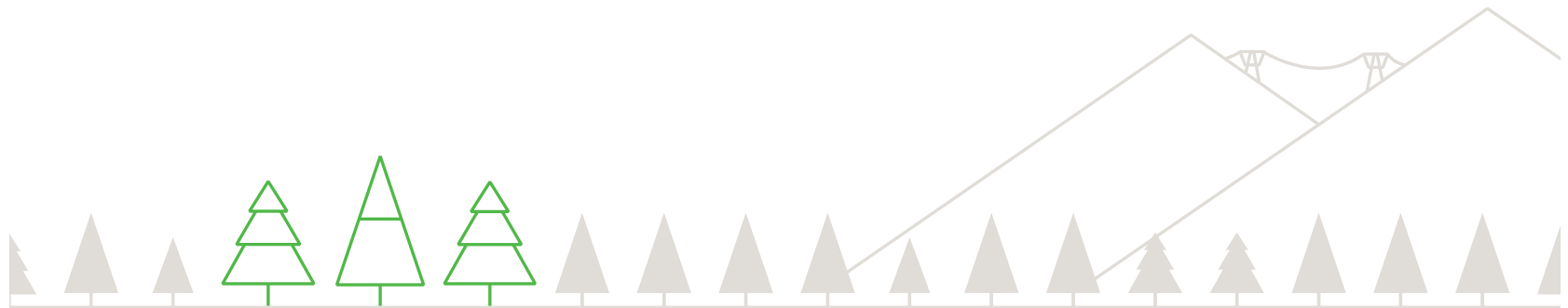
Higher

Lower

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Freshet Rate

- Overview
- Year 4 results
- Proposal for permanent rate



FRESHET RATE OVERVIEW

- Pilot rate for 4 years (2016, 2017, 2018, 2019)
- Annual evaluation reports + Final Evaluation Report
- Optional rate for existing RS 1823 customers
- Non-firm service for incremental load
- Service is specific to Freshet Period of 01 May – 31 July
- Energy charge only (indexed to day ahead Mid-C prices)
- No demand charge (no investment in generation or network)
- **Commission Order G-109-19 directed BC Hydro to file for a permanent Freshet Rate by September 30, 2019***

** BCUC subsequently approved a filing extension to October 31, 2019*

FRESHET RATE DESIGN

HLH Net/Gross Ratio



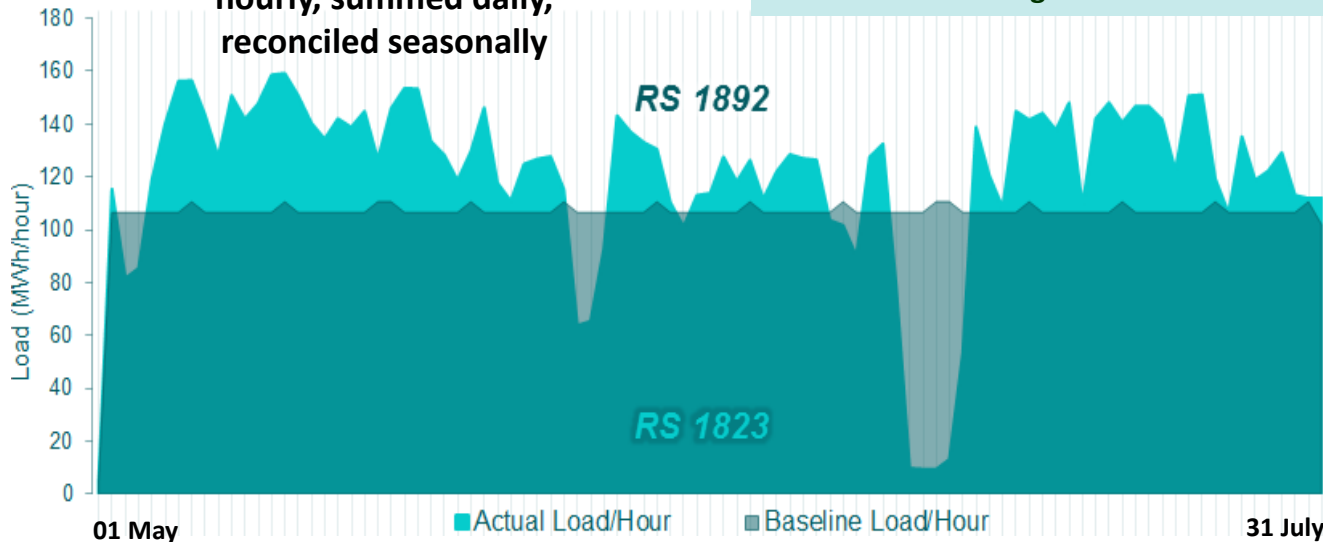
LLH Net/Gross Ratio



Overage energy = calculated hourly, summed daily, reconciled seasonally

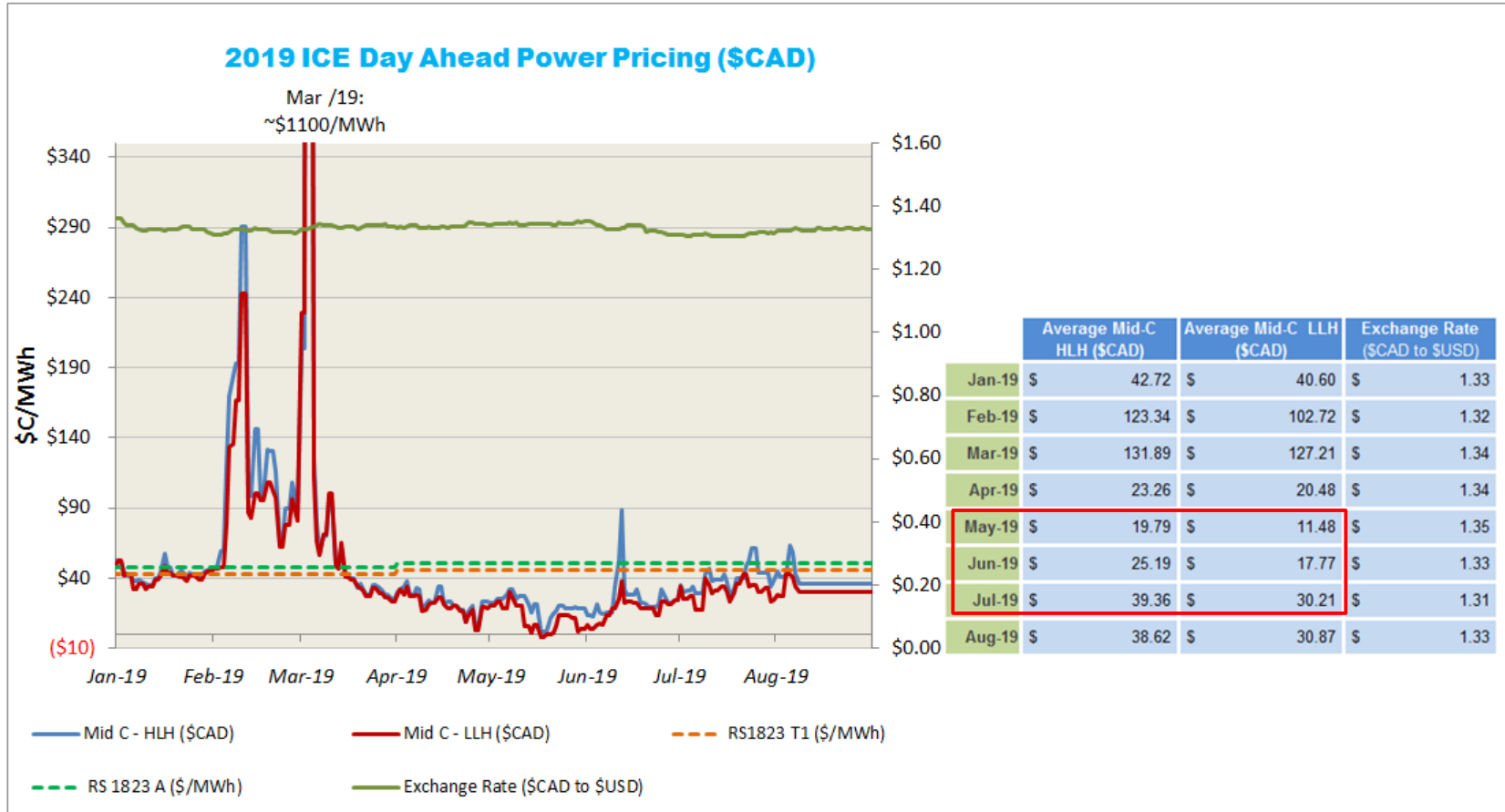
Rate Design Elements

- Market-referenced pricing for net incremental energy
- Day ahead Mid-C price (HLH and LLH) applies to net energy volumes; \$0 price floor / no cap
- \$3/MWh “wheeling charge” on net daily energy volume
- **No demand charge for load > Reference Demand**



Energy baselines (HLH and LLH)

YEAR 4 RESULTS: MID-C PRICING



YEAR 4 RESULTS: PARTICIPATION AND LOAD

RS 1892 SUMMARY OF RESULTS	YEAR 1	YEAR 2	YEAR 3	YEAR 4
	May - July 2016	May - July 2017	May - July 2018	May - July 2019
Total # of Participant Customer Sites	39	44	45	37
RS 1892 energy sales (MWh)	139,064	168,400	150,383	111,468
Average incremental load (Ave. MW/hr)	63.0	76.3	68.1	50.5
Average unit cost of market-priced energy (C\$/MWh)	\$ 21.88	\$ 19.50	\$ 23.81	\$ 24.27
RS 1892 energy revenue (\$M)	\$ 3.04	\$ 3.28	\$ 3.58	\$ 2.71
Plus C\$3/MWh wheeling fee on energy volume (\$M)	\$ 0.42	\$ 0.51	\$ 0.45	\$ 0.33
Plus 5% rate rider (\$M)	\$ 0.17	\$ 0.19	\$ 0.20	n/a
Total RS1892 energy sales (excluding taxes)	\$ 3.63	\$ 3.98	\$ 4.23	\$ 3.04

- Interim BCUC approval for Year 4 extension on 15 April 2019
- Limited time for some customers to meaningfully participate
- Reduced volumes reflect operational constraints at some sites

YEAR 4 RESULTS: RATEPAYER IMPACT

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

25

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

MID-C PRICE SUMMARY FOR FRESHET RATE PILOT

HLH	May Average Mid-C HLH (\$CAD)	June Average Mid-C HLH (\$CAD)	July Average Mid-C HLH (\$CAD)
2016	\$ 17.80	\$ 27.32	\$ 38.38
2017	\$ 20.35	\$ 18.50	\$ 36.10
2018	\$ 13.74	\$ 19.91	\$ 84.18
2019	\$ 19.79	\$ 25.19	\$ 39.36

LLH	May Average Mid-C LLH (\$CAD)	June Average Mid-C LLH (\$CAD)	July Average Mid-C LLH (\$CAD)
2016	\$ 13.09	\$ 19.16	\$ 27.92
2017	\$ 2.68	\$ 1.05	\$ 26.92
2018	\$ (0.30)	\$ 5.57	\$ 39.82
2019	\$ 11.48	\$ 17.77	\$ 30.21

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.



Do you support BC Hydro offering an optional Freshet Rate on a permanent basis?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

In general, do you agree with BC Hydro maintaining the "status quo" for a permanent Freshet Rate (i.e., maintain the same design, pricing and terms as the 4 year pilot)?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Do you agree with the minor housekeeping changes that BC Hydro proposes to make to Freshet Rate Schedule 1892?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Incremental Energy Rate

- Context
- Feedback themes from Oct/Nov 2018 workshops
- Mid-C market price history
- Proposed pilot rate design



EVIDENCE OF SUPPORT

24 We are and have been out consulting with
 25 ratepayer groups last year and through the fall on
 26 incremental rate options to grow revenues, so making

Allwest Reporting Ltd., Vancouver, B.C.

BC Hydro does plan to apply to the BCUC in fall 2019 to make permanent its pilot Freshet Rate and to introduce a new pilot Incremental Energy Rate. These optional rates would be for the provision of incremental electricity on a non-firm, interruptible basis to transmission service customers.

Zone II
 Ratepayers
 Group: IR 1.3.2

BC Hydro - F2020-F2021 Revenue Requirements
 Workshop - March 15, 2019 - Volume 1

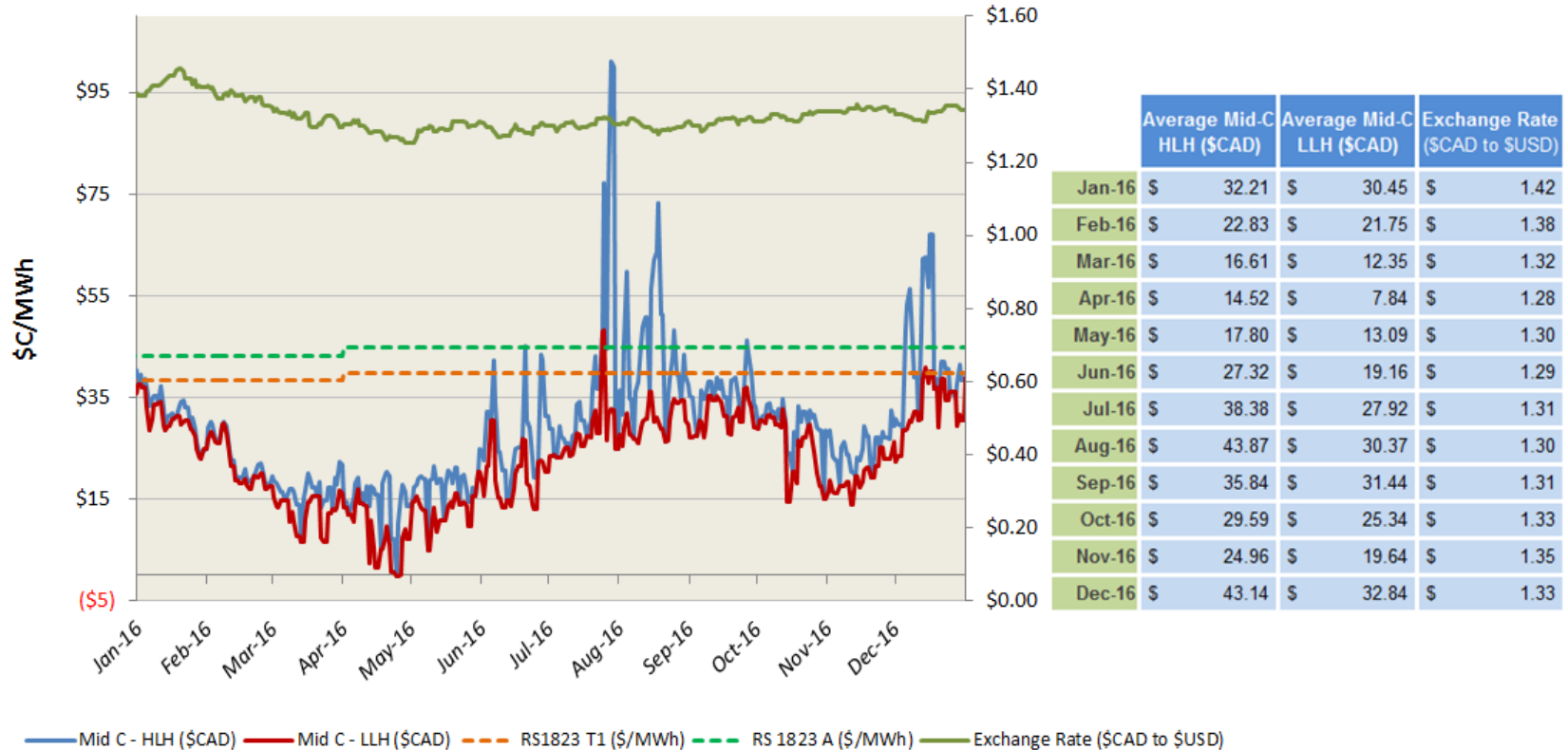
Page: 52

32 1 permanent the freshet rate, and we intend to make that
 2 permanent. We're also looking for a long-term -- or
 3 sorry, a year-round equivalent of a freshet rate that
 4 would give existing customers at the margin access to
 5 market prices.

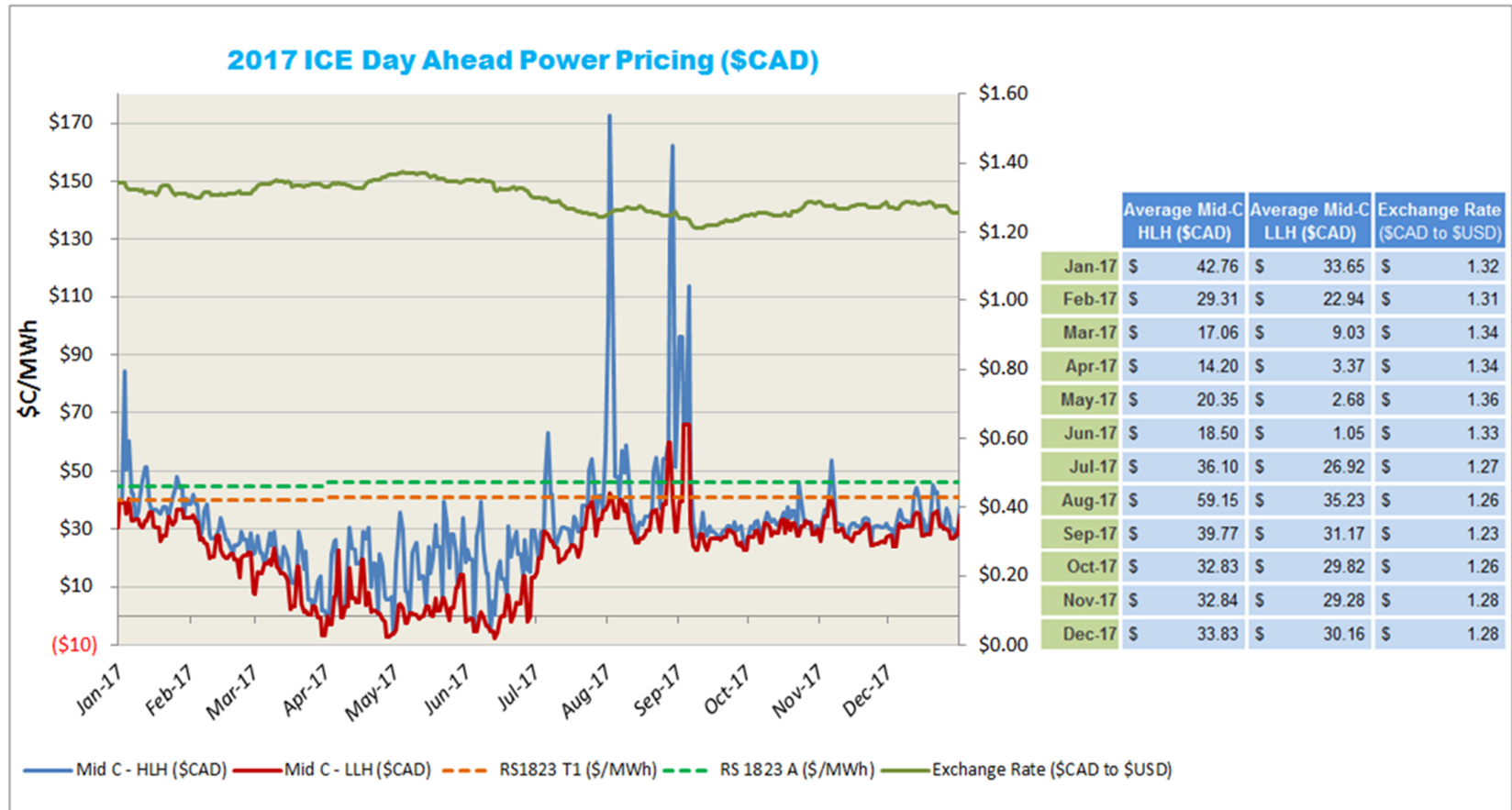
BC Hydro
 Power smart

MARKET PRICING CONTEXT: MID-C 2016

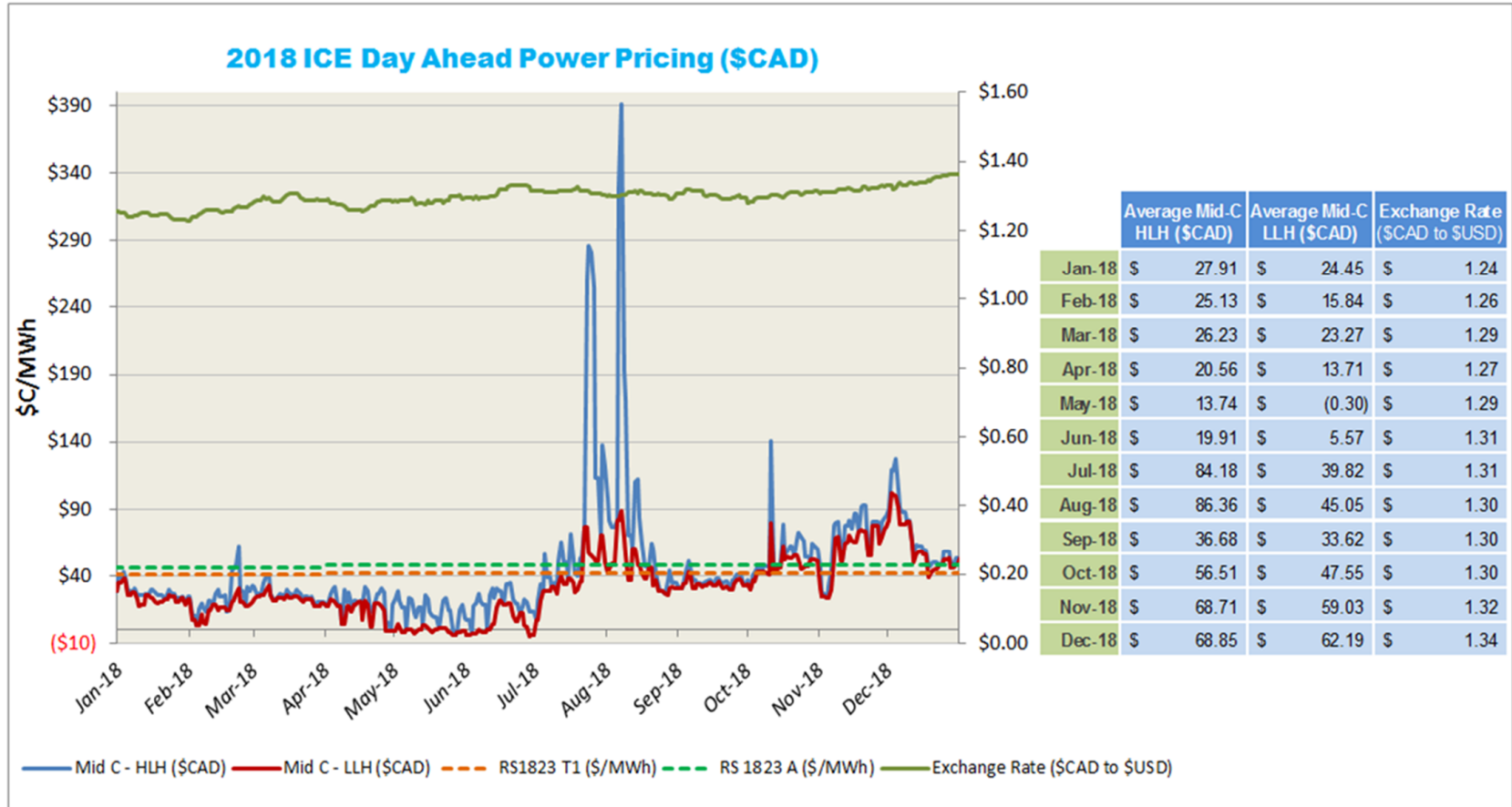
2016 ICE Day Ahead Power Pricing (\$CAD)



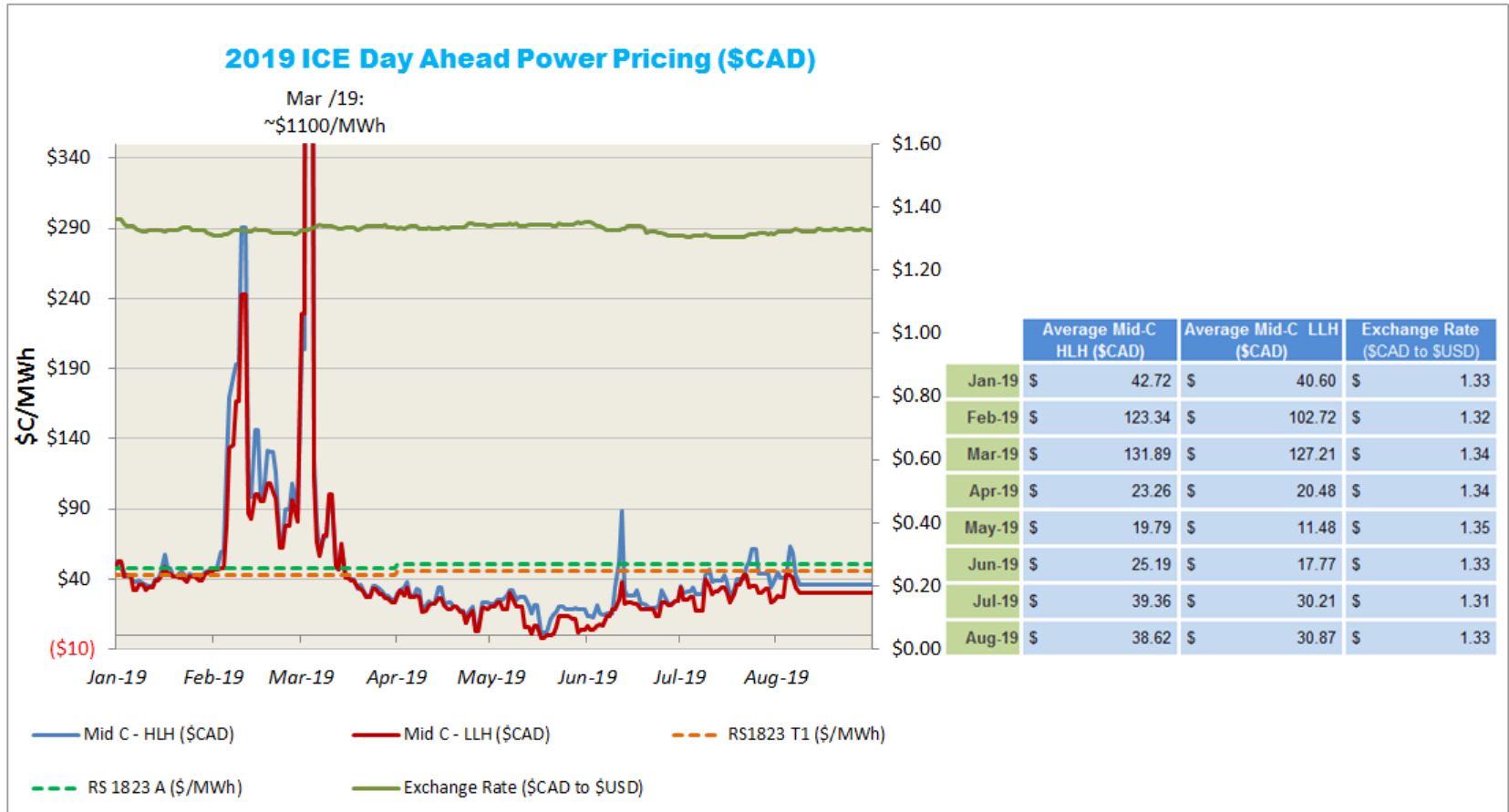
MARKET PRICING CONTEXT: MID-C 2017



MARKET PRICING CONTEXT: MID-C 2018

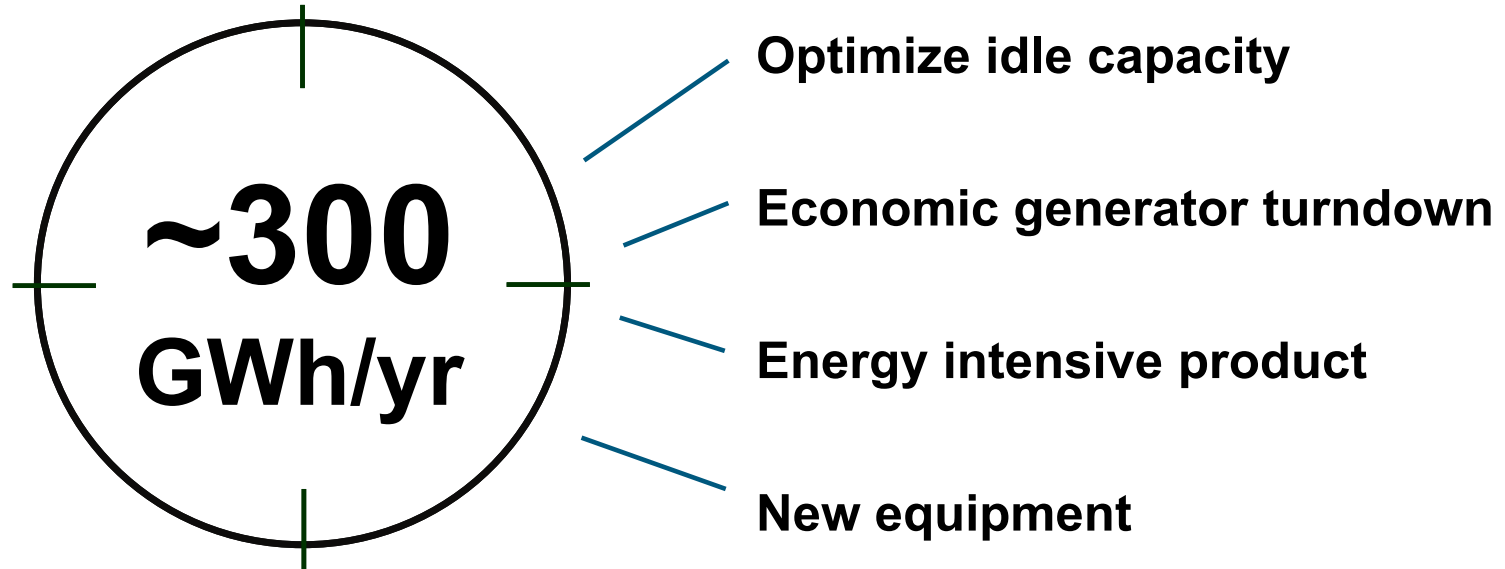


MARKET PRICING CONTEXT: MID-C 2019



PRELIMINARY ESTIMATE OF INCREMENTAL LOAD

Preliminary estimate of incremental load potential from RS 1823 customers over a full year ...

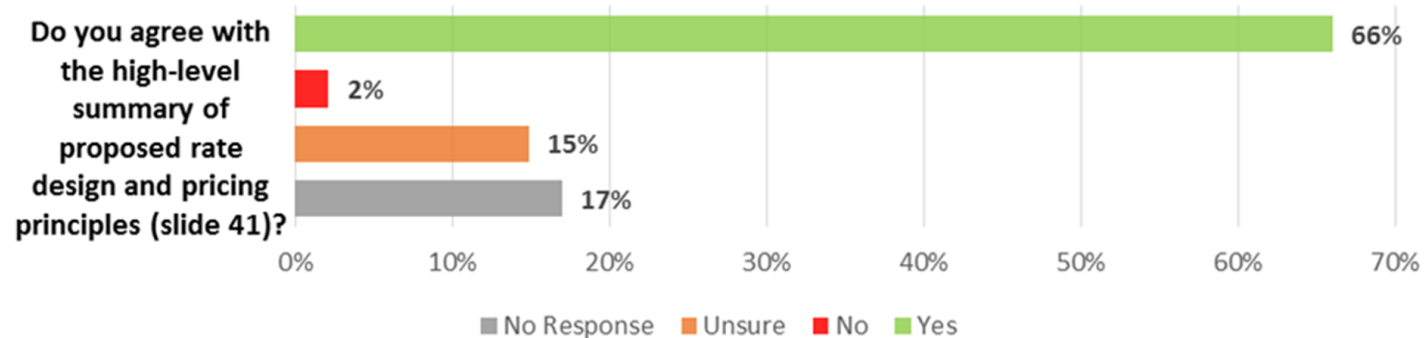
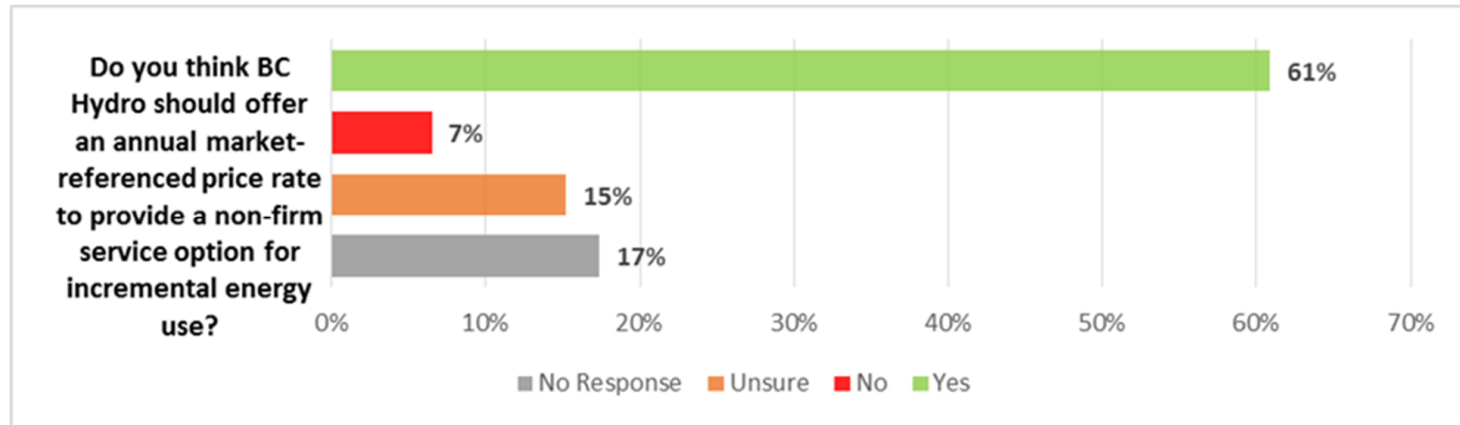


'STRAWMAN' RATE DESIGN PROPOSAL: OCT 2018

Criteria	Incremental Energy Rate
Service type:	Non-firm, interruptible (to extent BCH has available energy and capacity)
Eligibility:	Existing RS 1823 customers
Size:	5 MW minimum ESA Contract Demand
Contract Term:	1 year, effective April 1st
Notice:	Written notice of intent to participate by 01 March
Baselines:	Energy CBL (HLH and LLH) and Reference Demand, by calendar month
Baseline Determination:	Most recent annual period (365 days of historical RS 1823 electricity use)
Baseline Adjustment:	Per TS 74 criteria, with Commission approval
Energy Pricing:	ICE Index: Day ahead Mid-C for On-Peak (HLH) and Off-Peak (LLH)
Demand Charge:	No demand charge for load above Monthly Reference Demand
Risk Adjustment Factor:	\$/MWh monthly adder based on BPA wheel fee (with seasonal adjustments)
Rate Structure underlay	RS1823 pricing = lesser of baseline or actual electricity use (calculated hourly)
Rate Structure overlay	RSxxxx pricing = daily net incremental energy x daily Mid-C price (HLH and LLH)
Interruptibility + Notice:	Reduce load to baseline with 2hr minimum notice requirement
Penalty for Non-compliance:	150% x daily market price for energy > baseline during Interruption Period
Special Condition 1:	No dual participation in Freshet Rate and Incremental Energy Rate
Special Condition 2:	Opt-out at any time; no re-bill for completed Billing Periods; no in/out privileges

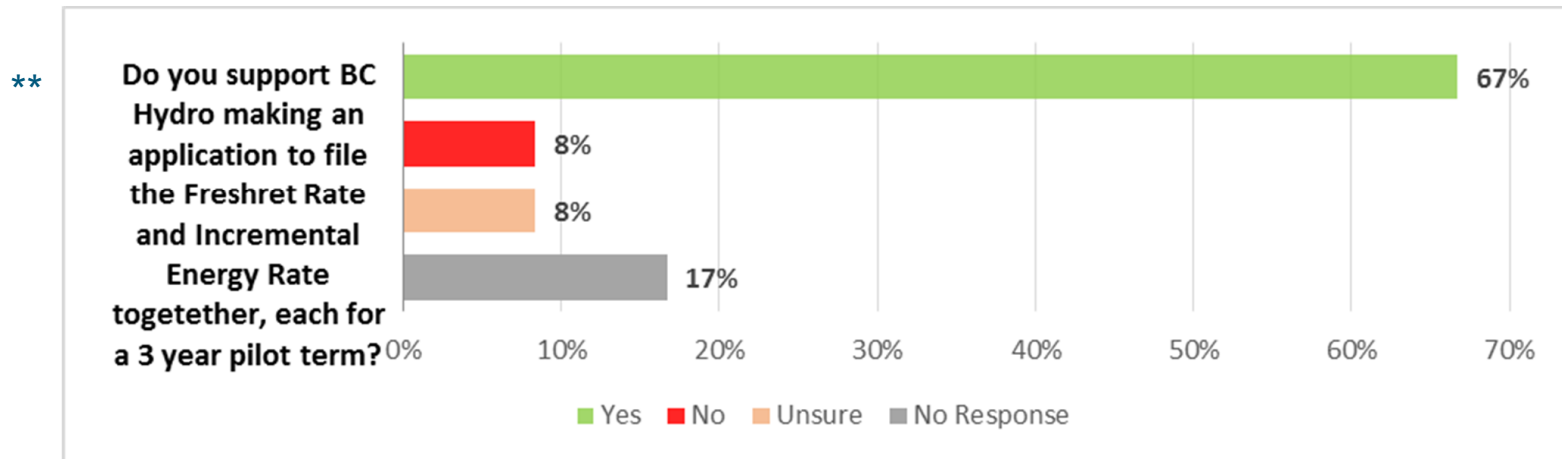
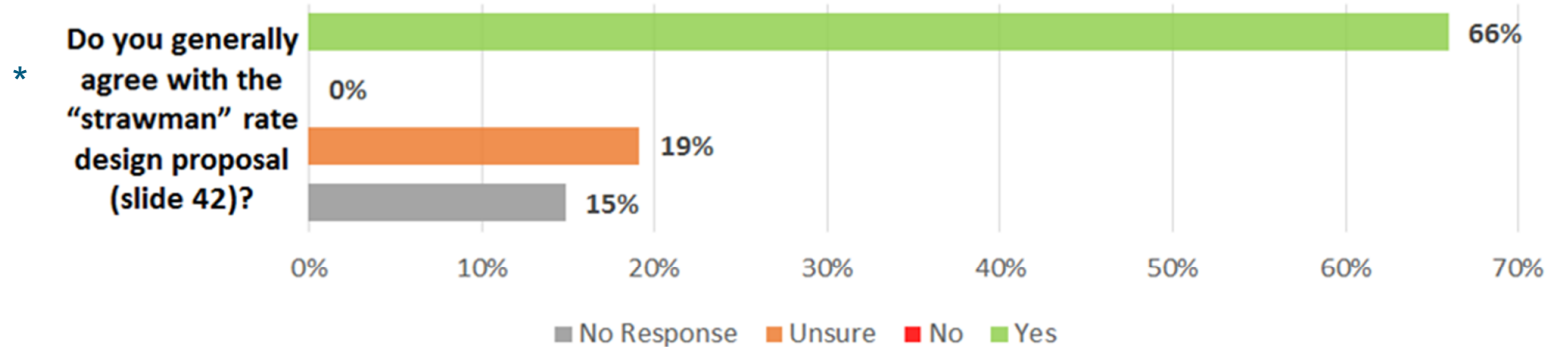
Preliminary rate design concept that BC Hydro sought feedback on ...

FEEDBACK THEMES*



* Consolidated written feedback form responses from October 2018 rate design workshop (46 respondents)

FEEDBACK THEMES



* Consolidated written feedback form responses from October 2018 rate design workshop (46 respondents)

** Consolidated written feedback form responses from November 2018 rate design workshop (12 respondents)

FEEDBACK THEMES

KEY THEMES

- ❖ Support for annual rate option with monthly settlement
- ❖ Rate choice provides incentive to use incremental energy and lower costs
- ❖ Risk exposure for incremental load based on market price volatility
- ❖ Interaction with RS 1823 will need to be carefully considered

“... customers are sophisticated enough to manage their energy requirements in response to daily changes in market conditions.”

“... this rate may encourage customers to increase their productivity when they might otherwise have not.”

“... BC Hydro can gain sales on latent loads that otherwise would not have been consumed under the Tier 2 energy rate.”

“... BC Hydro should adopt strict opt-out and cancellation provisions to protect ratepayers.”

KEY ELIGIBILITY AND DESIGN CRITERIA

AVAILABILITY

- ❖ For RS 1823 and RS 1828 customers only
- ❖ Minimum 2 years consumption history
- ❖ Minimum ESA Contract Demand of 10 MVA
- ❖ 3yr pilot rate with target commencement of August 2020
- ❖ No in/out privileges / no switching between RS 1892 and RS 1880

BASELINE DETERMINATION

- ❖ F2019 fiscal year, or most recent annual period (if no F2019 history)
- ❖ Baseline adjustments consistent with TS 74
- ❖ Adjusted baselines remain subject to BCUC approval

INTERRUPTIBILITY

- ❖ For physical system constraints (generation or network, planned or forced)
- ❖ Ability to reduce load to Reference Demand within 60 minutes

BASELINE DETERMINATION EXAMPLE

Same concept as Freshet Rate... but with calendar monthly baseline

BC Hydro - RS 1893 Baselines for Incremental Energy Rate						RS 1893 Energy and Demand Baselines		
Customer:	ABC Pulp & Paper					RS 1893- Monthly HLH & LLH Baselines		
Site:	ABC Pulp & Paper					RS 1893 Reference Demand		
Account(s):	12345							
Period:	April 1, 2017 (00:00 hr) - March 31, 2018 (23:59 hr)							
	(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-17	22,820,352	384	19,172,008	336	41,992,360	59,428	57,060	66,158
May-17	18,632,155	416	15,232,399	328	33,864,554	44,789	46,440	53,198
Jun-17	18,255,455	416	14,776,179	304	33,031,634	43,883	48,606	53,198
Jul-17	18,100,122	400	16,536,045	344	34,636,167	45,250	48,070	53,198
Aug-17	24,442,880	416	20,384,090	328	44,826,970	58,757	62,147	65,630
Sep-17	24,088,453	400	19,586,980	320	43,675,433	60,221	61,209	64,072
Oct-17	19,793,080	400	16,166,932	344	35,960,012	49,483	46,997	64,336
Nov-17	24,937,651	400	20,832,295	321	45,769,946	62,344	64,898	65,973
Dec-17	24,750,890	400	21,105,322	344	45,856,212	61,877	61,353	64,416
Jan-18	24,309,628	416	20,810,284	328	45,119,912	58,437	63,446	66,158
Feb-18	19,342,677	368	17,418,004	304	36,760,681	52,562	57,296	63,967
Mar-18	22,576,143	416	18,810,399	327	41,386,542	54,270	57,524	65,419

43

ILLUSTRATIVE ENERGY ADDER (SHAPED)

1	\$ 9.00	Jan
2	\$ 9.00	Feb
3	\$ 9.00	Mar
4	\$ 6.00	Apr
5	\$ 3.00	May
6	\$ 3.00	Jun
7	\$ 3.00	Jul
8	\$ 6.00	Aug
9	\$ 6.00	Sep
10	\$ 9.00	Oct
11	\$ 9.00	Nov
12	\$ 9.00	Dec

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

MODEL ASSUMPTIONS:

- \$55/MWh strike price for incremental non-firm load = total 263 GWh
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact
- **Note that results above are preliminary, illustrative and subject to change**

44

ILLUSTRATIVE ENERGY ADDER (FLAT)

1	\$ 8.00	Jan
2	\$ 8.00	Feb
3	\$ 8.00	Mar
4	\$ 8.00	Apr
5	\$ 3.00	May
6	\$ 3.00	Jun
7	\$ 3.00	Jul
8	\$ 8.00	Aug
9	\$ 8.00	Sep
10	\$ 8.00	Oct
11	\$ 8.00	Nov
12	\$ 8.00	Dec

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

MODEL ASSUMPTIONS:

- \$55/MWh strike price for incremental non-firm load = total 264 GWh
- Model incorporates 46 years of historical weather sequences with the impact of natural gas price and weather on forward Mid-C market prices
- Model calculates the difference between forward Mid-C prices and the expected value of energy in the system to estimate the BC Hydro ratepayer impact
- **Note that results above are preliminary, illustrative and subject to change**

INCREMENTAL ENERGY RATE



WORKED EXAMPLE
Refer to handout

For the Incremental Energy Rate, do you think that the proposed rate design structure and pricing will send the right signals to encourage incremental energy use?

Yes
No
Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

For the Incremental Energy Rate, do you think that the proposed eligibility criteria (i.e., at least 2 years of electricity consumption history and minimum 10 MVA ESA Contract Demand) are reasonable?

Yes
No
Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Do you understand how energy and demand baselines will be determined (and adjusted) for the proposed Incremental Energy Rate?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

For the Incremental Energy Rate, do you think that the proposed energy charge adder in non-freshet months (equivalent to ~ \$8/MWh on average) is a fair and prudent way to protect non-participant ratepayers?

Yes
No
Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

**For the proposed Incremental Energy Rate,
in non-freshet months, do you prefer an
energy charge adder that is shaped by
calendar month - or that is flat across each
month?**

Shaped
adder

Flat adder

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Do you think that your business might have the interest and/or ability to participate under the proposed Incremental Energy Rate?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Do you support BC Hydro making an application to the BCUC for an optional Incremental Energy Rate as a three year pilot?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Indirect Interconnection Service & Electricity Resale

- Overview: How Indirect Service Works
- Agreement Structure and Regulatory Considerations
- Process Steps and Supporting Documents



INDIRECT INTERCONNECTION SERVICE



Low cost



Reliable

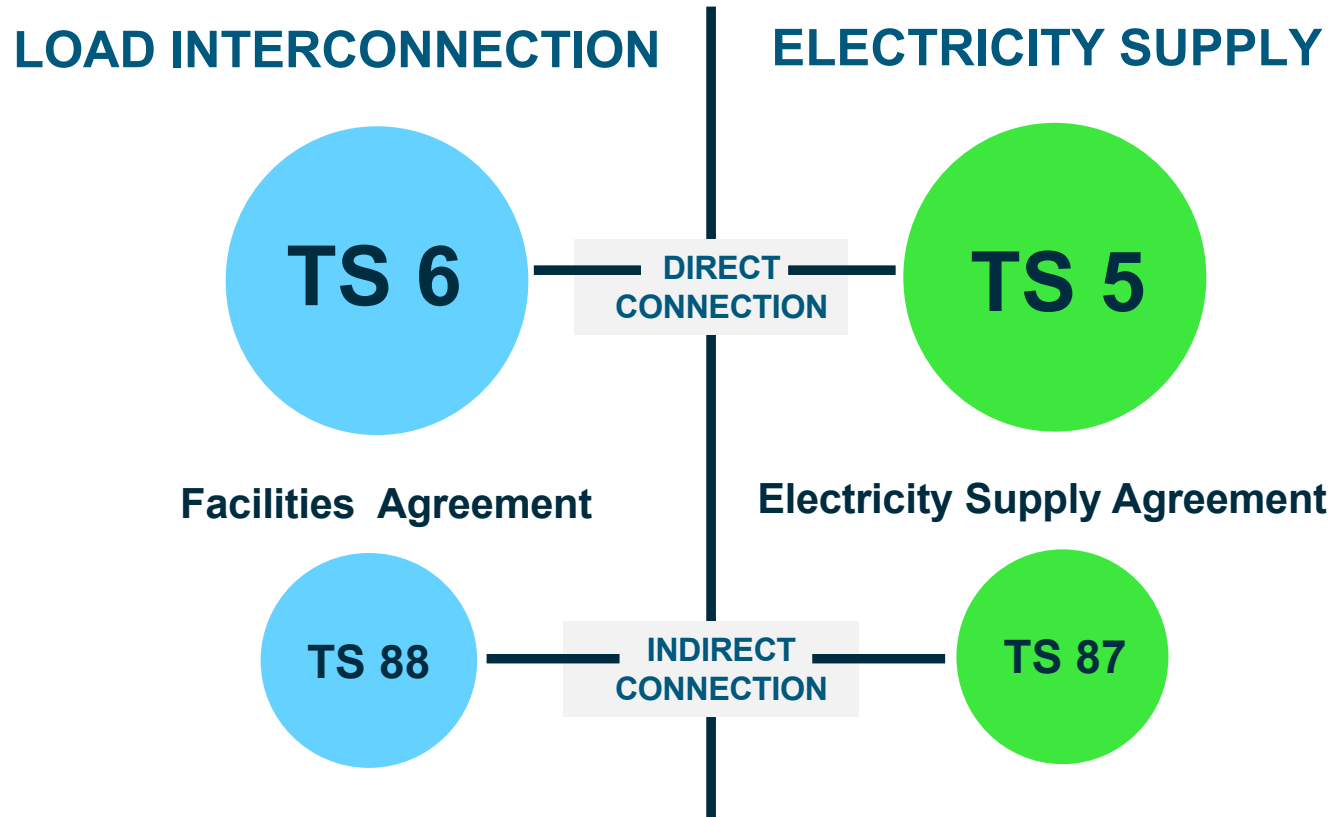


Clean



Abundant

INDIRECT INTERCONNECTION SERVICE

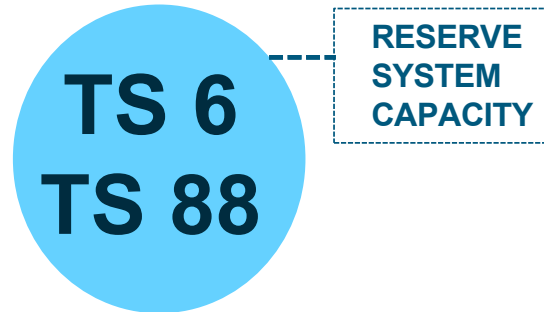


TS 87 and TS 88 allow for the provision of service by BC Hydro to transmission-voltage load customers that connect to the BC Hydro system through transmission facilities owned by a third-party

56

INDIRECT INTERCONNECTION SERVICE

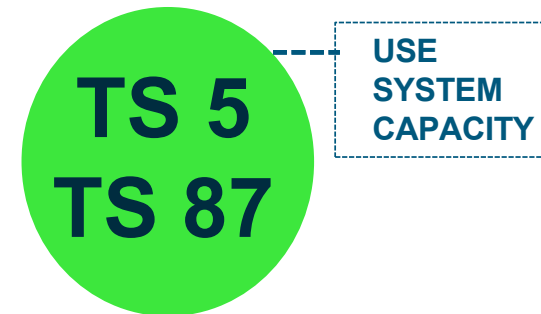
LOAD INTERCONNECTION



Facilities Agreement

- Stipulates the terms, conditions, and cost allocation for the construction of BC Hydro and private transmission facilities required to serve load
- Reflects a contractual commitment for reservation of system capacity.
- Customer is responsible to secure and/or pay for costs of BC Hydro system reinforcement
- In force until all payments have been made and security returned

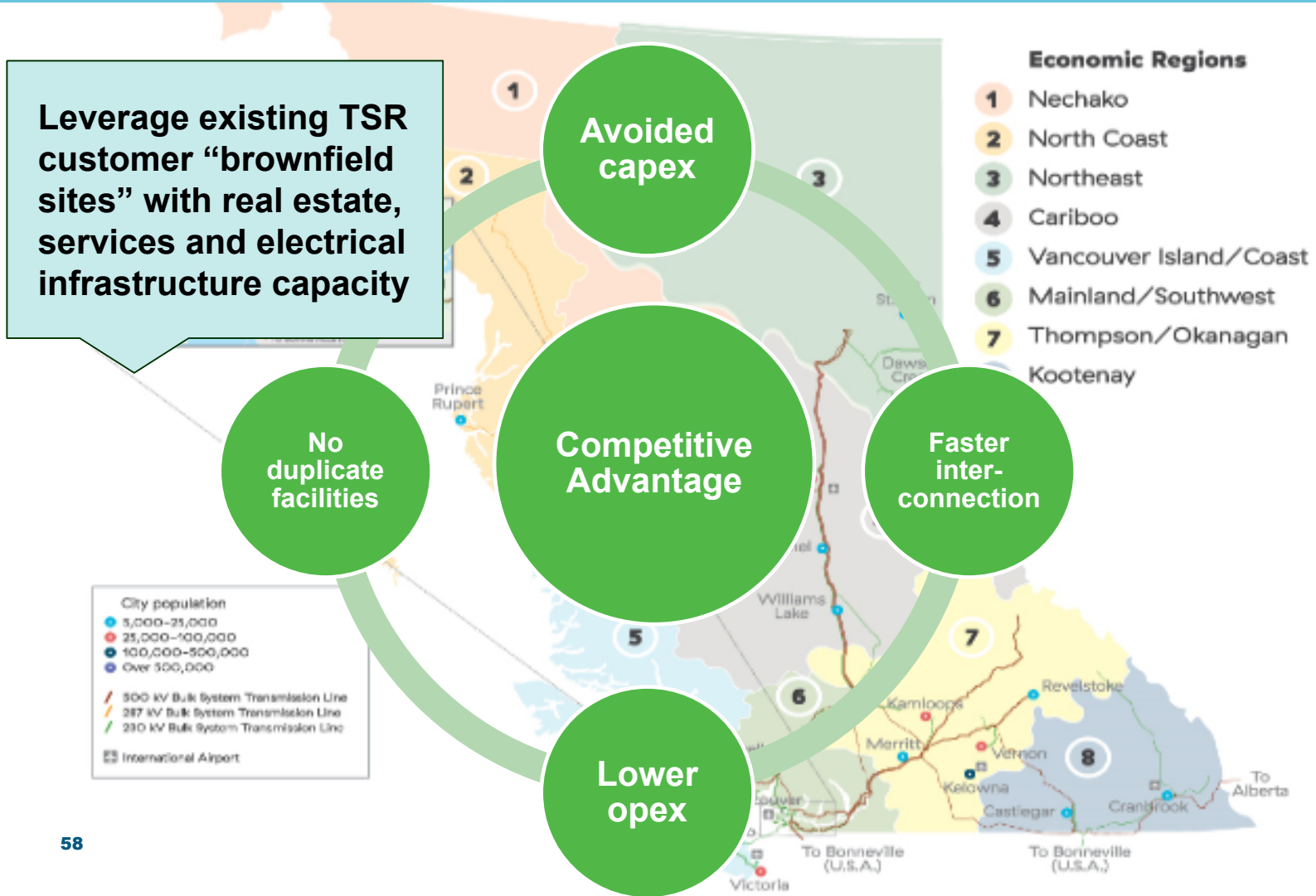
ELECTRICITY SUPPLY



Electricity Supply Agreement

- Sets out terms and conditions under which BC Hydro will provide electricity
- Takes effect once the transmission line serving the customer load is energized
- Reflects a dedicated right for use of BC Hydro system capacity by the customer
- Includes basic provisions re: aspects of the interconnection of BC Hydro system with the customer's facilities

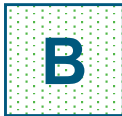
INDIRECT INTERCONNECTION SERVICE



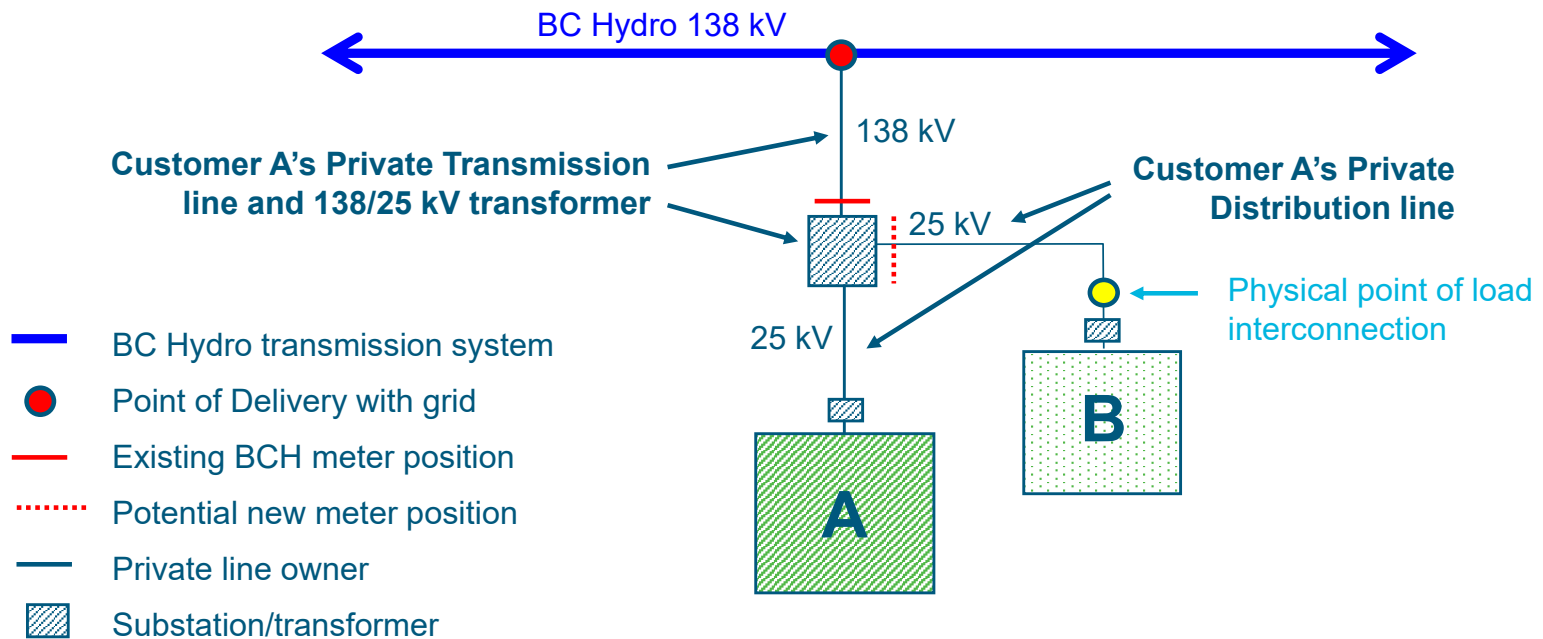
Existing TS 5 “HOST” customer with “NEW LOAD ENTITY” connected to their privately-owned facilities



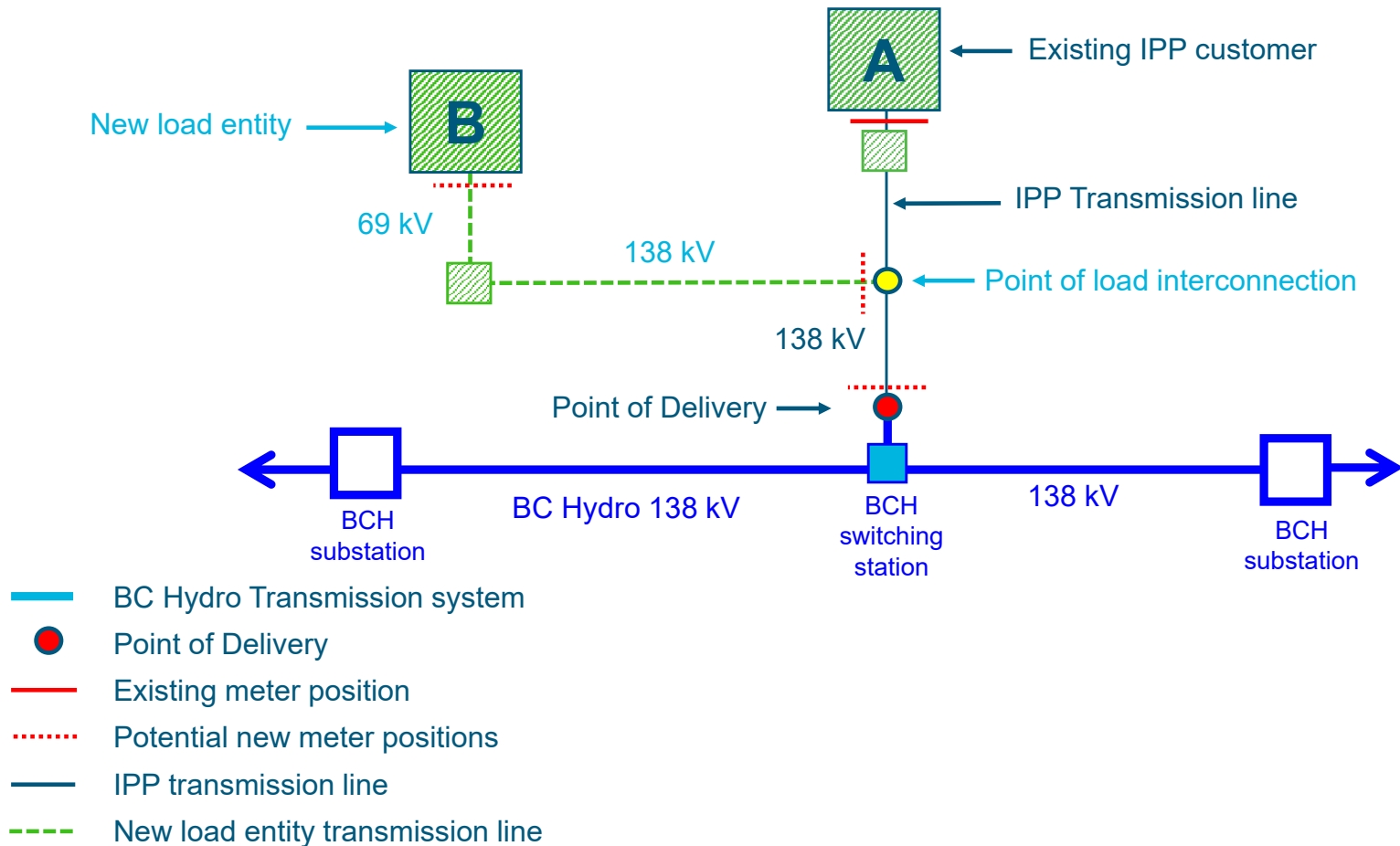
Customer A is existing BC Hydro load customer served under TS 5
 Customer A owns a 138 kV line that interconnects with the BC Hydro 138 kV system
 Customer A owns the 138/25 kV step-down transformer and connecting 25 kV distribution line



Customer B becomes an indirect service customer of BC Hydro under TS 87/88
 Customer B is physically served electricity via Customer A's electrical infrastructure
 Customer B enters into a utility services / wheeling agreement with Customer A



Existing IPP with proposed new load entity connected to their private transmission line



AGREEMENT STRUCTURE FOR INDIRECT SERVICE

Disclaimer: Reflects general information and directional guidance only. Does not constitute legal or other professional advice. Individual customer circumstances and requirements may vary. Reader should seek advice before relying or acting on any of this information.

Agreements	New Load Customer	Host Customer	BCH	BCUC	MEMPR
TS 87 - Electricity Supply Agreement	X		X		
TS 88 - Facilities Agreement	X		X		
Load Interconnection Agreement		X	X		
Local Operating Order		X	X		
Metering & Billing	X		X		
Wheeling Agreement	X	X		X	X

Regulatory Considerations for HOST Customer:

- Responsible to obtain exemption for electricity wheeling service
 - Under Section 22 of UCA: via ministerial regulation
 - Under Section 88(3) of UCA: via BCUC approval with advance ministerial approval

INDIRECT INTERCONNECTION SERVICE

Section 22 of Utilities Commission Act

Exemptions

- 22** (1) In this section, "minister" means the minister responsible for the administration of the *Hydro and Power Authority Act*.
- (2) The minister, by regulation, may
- (a) exempt from any or all of section 71 and the provisions of this Part
 - (i) a public utility, or
 - (ii) a public utility in respect of any equipment, facility, plant, project, activity, contract, service or system of the public utility, and
 - (b) in respect of an exemption made under paragraph (a), impose any terms and conditions the minister considers to be in the public interest.
- (3) The minister, before making a regulation under subsection (2), may refer the matter to the commission for a review.

Section 88 of Utilities Commission Act

Application of orders

- 88** (1) In making an order, rule or regulation, the commission may make it apply to all cases, or to a particular case or class of cases, or to a particular person.
- (2) The commission may exempt a person from the operation of an order, rule or regulation made under this Act for a time the commission considers advisable.
- (3) The commission may, on conditions it considers advisable, with the advance approval of the minister responsible for the administration of the *Hydro and Power Authority Act*, exempt a person, class of persons, equipment or facilities from the application of all or any of the provisions of this Act or may limit or vary the application of this Act.
- (4) The commission has no power under this section to make an order respecting a person, or a person in respect of a matter, who has been exempted under section 22.

AGREEMENT STRUCTURE FOR RESALE

Disclaimer: Reflects general information and directional guidance only. Does not constitute legal or other professional advice. Individual customer circumstances and requirements may vary. Reader should seek advice before relying or acting on any of this information.

Agreements	New Load Customer	Host Customer	BCH	BCUC	MEMPR
TS 5 - Electricity Supply Agreement		X	X		
TS 6 - Facilities Agreement		X	X		
<i>Load Interconnection Agreement (not required)</i>					
Local Operating Order		X	X		
Metering & Billing	X	X			
Wheeling Agreement	X	X		X	X
Notice of resale (Sect. 24 of TS 5)		X	X		
Electricity resale authorization		X		X	

Regulatory Considerations for Host Customer:

- Responsible to obtain exemption for electricity wheeling service
- Responsible to obtain Commission authorization for electricity resale

ELECTRICITY RESALE PROVISION IN TS 5

RESALE OF ELECTRICITY

24. The Customer shall not sell, or otherwise dispose of for compensation, all or part of the Electricity supplied pursuant to this Agreement to any other person directly or indirectly without prior authorization from the British Columbia Utilities Commission and notice to B.C. Hydro.

KEY PROCESS STEPS: CUSTOMER

***Disclaimer:** Reflects general information and directional guidance only. Does not constitute legal or other professional advice. Individual customer circumstances and requirements may vary. Reader should seek advice before relying or acting on any of this information.*

CUSTOMER - KEY CONSIDERATIONS

Step 1	Complete/submit Load Interconnection Request Form to BC Hydro
Step 2	Pay for all required System Studies by BC Hydro (e.g., System Impact and Facilities Study)
Step 3	Consider service distinction (e.g., Firm vs non-firm) and ESA Contract Demand impacts for the new load (e.g., is incremental system capacity required? / can existing system capacity be utilized?)
Step 4	Negotiate/execute <i>lease agreement</i> between host customer and new load entity for site/land access
Step 5	Negotiate/execute <i>wheeling agreement</i> for the provision of electricity through the shared facilities (e.g., this is what makes the host customer a public utility)
Step 6	Host customer to apply to the BC Utilities Commission under Section 88(3) of the UCA for exemption from Part 3 of the UCA (<i>BC Hydro to issue letter of support, where applicable</i>)
Step 7	Commission to seek advance approval of the Lieutenant Governor for the exemption under section 22 of the UCA
Step 8	Commission conducts application review process/hearing and issues Exemption Order, including any caveats

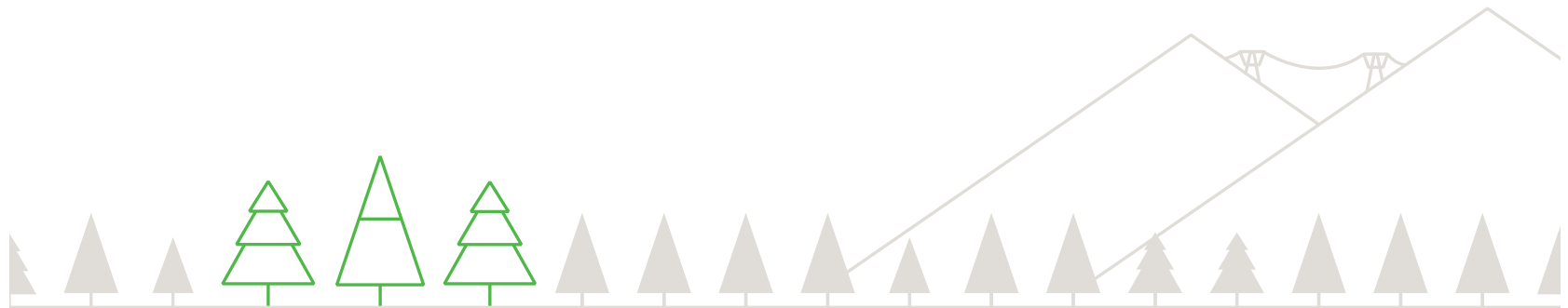
KEY PROCESS STEPS: BC HYDRO

Disclaimer: Reflects general information and directional guidance only. Does not constitute legal or other professional advice. Individual customer circumstances and requirements may vary. Reader should seek advice before relying or acting on any of this information.

BC HYDRO – KEY CONSIDERATIONS	
Step 1	Process Load Interconnection Request (<i>for load request as ‘new customer’ or as ‘load increase for existing customer’</i>)
Step 2	Complete load interconnection STUDIES (System Impact Study and Facilities Study – to determine system requirements, metering, etc. to serve load) ... this is at customer cost
Step 3	Execute Facilities Agreement (TS 88) between BC Hydro and new load entity (security and/or cash may be required)
Step 4	Execute Load Interconnection Agreement between BCH and transmission facilities owner
Step 5	Review/confirm that commercial and regulatory arrangements by the parties have been finalized to BC Hydro’s reasonable satisfaction
Step 6	Execute Electricity Supply Agreement (TS 87) between BC Hydro and new load entity (security may be required)
Step 7	Implement metering/billing solution (<i>including deductive totalization, as applicable</i>)
Step 8	Revise Local Operating Order between BC Hydro and transmission facilities owner (<i>and new load entity, as applicable</i>)
Step 9	Support exemption application by transmission facilities owner to BCUC
Step 10	Initial CBL Determination (<i>including consideration of CBL adjustments under TS 74</i>)

TSR Business Practices

- Principles
- TSR Business Practices



TSR BUSINESS PRACTICES: PRINCIPLES

‘Consistent’

‘Fair’ and

‘Transparent’

application of rates and tariffs to all TSR customers in a consistent, fair, transparent and non-discriminatory manner, including providing the same treatments to customers in similar circumstances



Principles

TSR BUSINESS PRACTICES

***Disclaimer:** Reflects general information and directional guidance only. Does not constitute legal or other professional advice. Individual customer circumstances and requirements may vary. Reader should seek advice before relying or acting on any of this information.*

THE ISSUE

Where tariff is silent or does not expressly contemplate a unique and/or exceptional customer circumstance, business practices reflect the use of discretion to arrive at a fair, reasonable, stable and predictable outcome.

EXAMPLES

1. Average Billing Demand under RS 1823 for New Customers
2. ESA Contract Demand Reduction for Shutdown Plant
3. Sale of Site / Change in Site Ownership

AVERAGE BILLING DEMAND UNDER RS 1823

ISSUE

- The start-up and commissioning of large industrial plants can be complex and take significantly longer than 60 days.
- This can result in a temporary disconnect between the higher ESA Contract Demand required for full load operations at the site and initial plant load.

2. Billing Demand

The Billing Demand will be:

- (a) The highest kVA Demand during the High Load Hours (HLH) in the Billing Period; or
- (b) 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February, both months included; or
- (c) 50% of the Contract Demand stated in the Electricity Supply Agreement for the Customer's Plant,

whichever is the highest value, provided that for new Customers the Billing Demand for the initial two Billing Periods will be the average of the daily highest kVA Demands for the Customer's Plant.

BUSINESS PRACTICE

Customer can make a written request to BC Hydro for extension of average demand treatment under RS 1823 for plant start-up and commissioning. BC Hydro will consider extension requests consistent with past practice for customers in similar circumstances.

70

DEMAND REDUCTION FOR SHUTDOWN PLANT

ISSUE

- TS 5 does not have a provision for Contract Demand reduction when a customer plant is indefinitely or permanently shutdown.
- 6-months written notice for ESA termination by either BC Hydro or the customer is required.

TERM OF AGREEMENT

4. (a) Unless otherwise provided for by this Agreement, this Agreement shall be in force for an initial term of _____ from the Commencement Date and, unless terminated at the end of the initial term, shall extend until terminated in accordance with this Agreement.
- (b) Either party shall give the other party not less than 6 months notice if it intends to terminate the Agreement at the end of the initial term or thereafter and upon expiration of the notice period, this Agreement shall terminate.

BUSINESS PRACTICE

Customer can make a written request to BC Hydro for waiver of the 6 month notice for ESA termination. BC Hydro will consider in accordance with set criteria. If approved, the existing ESA will be terminated and replaced with a new ESA. This mitigates the impact of higher charges related to RS 1823 Billing Demand ratchets.

71

DEMAND REDUCTION FOR SHUTDOWN PLANT

CRITERIA

- Customer has significantly or completely shut down its plant for an indefinite (long-term) period due to market/economic downturn
- Customer has provided written notice to BC Hydro of its request for Contract Demand reduction / ESA termination before the start of the next Billing Period (i.e., no retroactive adjustment or back-dating)
- Customer agrees to a reduced Contract Demand in a new ESA with an effective date that reflects the start of the next Billing Period
- Customer must demonstrate to BC Hydro that it is not acting in an appropriate manner for the sole purpose of avoiding minimum RS 1823 demand charges
- Criteria apply to shutdown customers that request a further reduction in ESA Contract Demand to reflect a further reduction in the minimum electrical requirements of their plant.
- BC Hydro has no obligation to re-instate the customer's prior Contract Demand if plant is re-started. Allocation of system capacity via a new ESA (with a higher Contract Demand) will remain subject to BC Hydro's standard transmission system interconnection process.

72



Contract demand increase

CONTRACT DEMAND INCREASES

CONTRACT DEMAND, INCREASES IN KV.A DEMAND

6. (a) The Contract Demand under this Agreement is _____ kV.A. The Customer shall not exceed the Contract Demand without the prior approval of B.C. Hydro.

The Customer may nominate an increase in the Contract Demand and, subject always to B.C. Hydro's ability to supply, B.C. Hydro shall not unreasonably refuse to permit the nominated increase provided that any such increase is subject to Appendix 1 of Electric Tariff Supplement No. 6 Provisions Respecting System Reinforcement and Transmission Extension Policies for Permanent Service.

SITE SALE / CHANGE IN SITE OWNERSHIP

ISSUE

- **ESA assignment for site sale or changes in site ownership requires legal involvement from both parties which can be time consuming.**
- **A “new customer” remains subject to BC Hydro credit assessment (including consideration of security or advance billing).**

BUSINESS PRACTICE

Existing site owner can make a written request to BC Hydro for waiver of the 6 month notice for ESA termination. New owner must provide evidence of site ownership and Certificate of Company Registration. If approved, the ESA with existing owner will be terminated and a new ESA will be issued to the new owner. The effective date of ESA termination/commencement will be used to distinguish the financial responsibilities for electricity supply as between the parties.

SUCCESSORS, ASSIGNS

26. This Agreement shall enure to the benefit of and be binding upon the parties and their respective successors and assigns, provided, however, that this Agreement shall not be transferred or assigned by the Customer without prior consent of B.C. Hydro, which consent shall not be unreasonably withheld.

SECURITY DEPOSITS

12. (a) If:
- (i) the Customer has not maintained an account with B.C. Hydro for the purchase of Electricity under Schedule 1821 for the immediately preceding two years;
 - (ii) the Customer, at any time, has permitted any account under this Agreement to become overdue and has not supplied information which reasonably satisfies B.C. Hydro that the Customer is creditworthy; or
 - (iii) B.C. Hydro is not satisfied, on a reasonable basis, that the Customer is creditworthy;

UNIQUE SITE SPECIFIC MATTERS

APPENDIX

Provisions Respecting Transmission Extensions and Other Site Specific Matters

[This Appendix will contain site specific provisions from agreements in force prior to the Commencement Date of this new standard form Electricity Supply Agreement. This will include, but will not necessarily be limited to, rights and obligations related to existing Transmission Connections and Right-of-Way. In addition, this Appendix may also contain other site specific details related to the supply of Electricity for which no provision was made in this new standard form Electricity Supply Agreement.]

Proposed Amendments to Tariff Supplement 74 (TS 74)

- Market Curtailment and Plant Downsizing
- Efficient New Plant and Custom Duration
- Timely Submission of Claims for Annual Verification



MARKET CURTAILMENT: PROPOSED CRITERIA

MARKET CURTAILMENT

CBL DEBIT ADJUSTMENT FOR MARKET CURTAILMENT EVENT

1. **Customer can demonstrate to BC Hydro's reasonable satisfaction that its operations were temporarily impacted by the constraint of a key production input and/or feedstock material**
2. Provide written notice to BC Hydro within 90 days of the commencement of the market curtailment event that includes: (i) a description of the event; and (ii) an engineering estimate of the reduction in load signed by a P.Eng or Officer of the Company
3. Qualifying event of market curtailment will be deemed to end no later than the end of the Billing Year in which the event begins if the event continues into the next Billing Year, it will be considered as a new discrete event
4. Each discrete event of market curtailment must result in a verified decrease in annual energy consumption of at least 0.3 GWh.
5. Where a discrete market curtailment event exceeds 120 consecutive days, the plant will be considered to be temporarily or indefinitely shut-down and will be automatically transferred to RS 1823A in accordance with section 4.6.2

77

PLANT DOWNSIZING: PROPOSED CRITERIA

PERMANENT SHUT-DOWN

PROVISIONS FOR TRANSFER TO RS 1823A

Permanent Shut-down

A customer's plant will be **automatically transferred to** ~~put on~~ RS 1823A, effective as of the date ~~at the time~~ the plant is permanently shut-down, for an initial period of 12 Billing Periods. The plant may be maintained on RS 1823A beyond the initial 12 Billing Periods based on an assessment on consultation with the customer.

PLANT DOWNSIZING: PROPOSED CRITERIA

INDEFINITE SHUT-DOWN

PROVISIONS FOR TRANSFER TO RS 1823A

Temporary or Indefinite Shut-down

This treatment will also apply to a customer's plant that is subject to a temporary or indefinite shutdown which exceeds 90 consecutive days. The effective date of the RS 1823A commencement will be the day that is 91 days after the date the plant is shut-down, ~~or Where has partially shut down (including indefinite closure and indefinite idling) if the customer has made a formal request to reduce its ESA Contract Demand in connection with the temporary or indefinite shut-down partial shut down (including indefinite closure and indefinite idling), the~~ effective date of the RS 1823A commencement will be the date the plant is partially shut-down. If the customer's request for Contract Demand reduction is withdrawn before the ESA change becomes effective, the RS 1823A treatment will continue to apply, effective as of the date the plant is shut-down.

Do you agree with BC Hydro's proposed new provision and treatment for market curtailment events?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

In your view, what is the appropriate length of time (i.e., consecutive days) that a plant could be shutdown before it is treated as an indefinite plant shutdown and transferred to RS 1823A?

60 days
90 days
120 days
Other

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Do you agree with the proposed refinements to the 'Plant Downsizing' provision for: (i) Permanent plant shutdown; and (ii) Temporary or Indefinite Shutdown?

Yes
No
Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

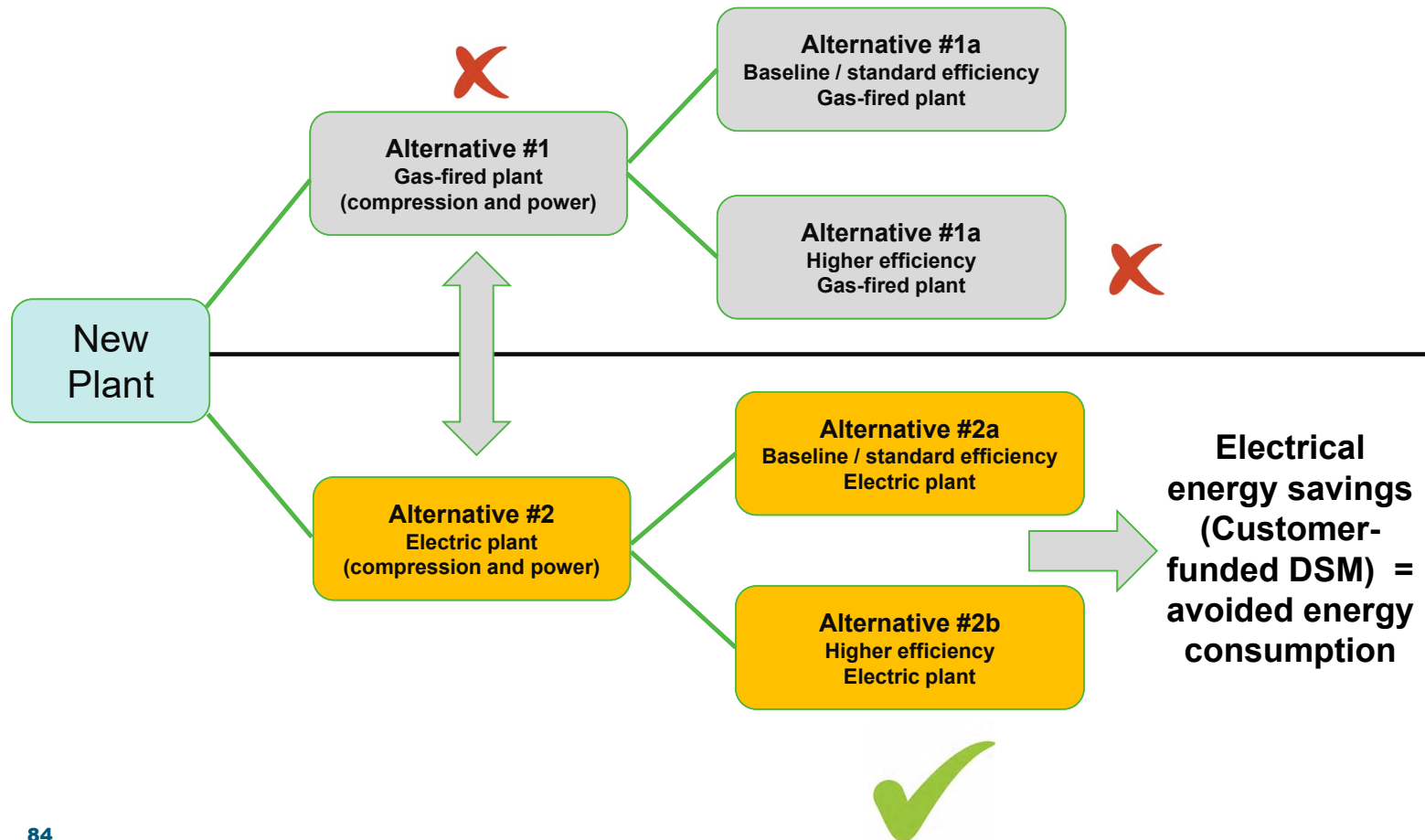
CUSTOM DURATION FOR CUSTOMER-FUNDED DSM

The Customer-funded DSM project Duration will be determined for each Customer-funded DSM project in accordance with the DSM project type classifications described below:

- Two years duration for Operational & Maintenance (O&M) DSM measures;
- Five years duration for Process Control/Procedure Optimization DSM measures;
- Ten years duration for 'Hard-wired' Equipment DSM measures, or;
- Custom duration for significant and complex DSM measures.

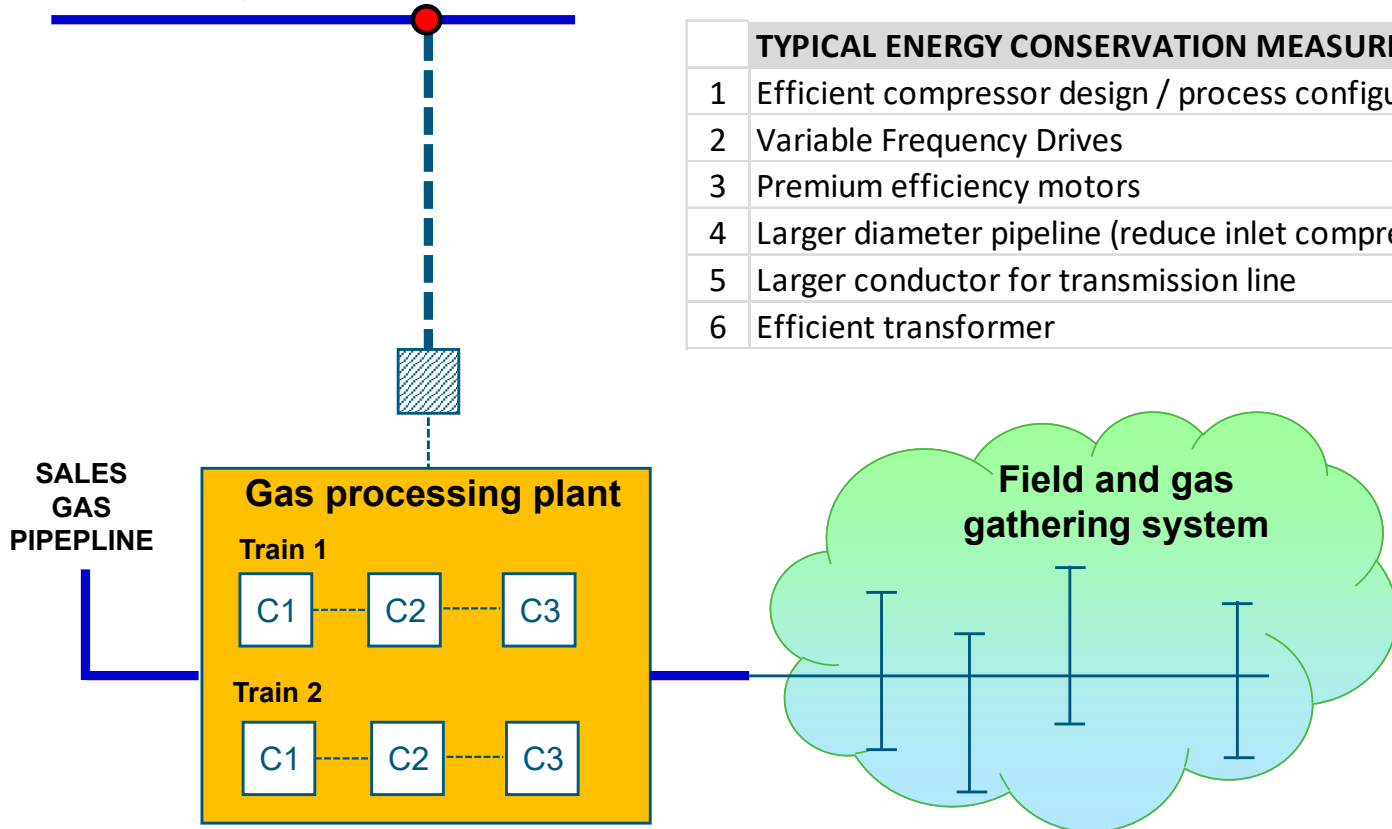
6.5.1.6 A custom Customer-funded DSM project Duration may be determined for a Customer-funded DSM project pursuant to Attachment A if the customer can demonstrate that it assumed a longer Duration would apply when making the original investment decision. To qualify, the customer must provide a Declaration, signed by a Professional Engineer (P.Eng) or Officer of the Company, that states the technical and financial project assumptions used by the customer to justify the original DSM project investment decision. The Declaration must clearly describe how energy savings duration (and the possibility of custom duration) was considered. Acting reasonably, BC Hydro may request that the customer provide supporting historical documentation (e.g. business case, executive memo, financial model) for review.

EFFICIENT NEW PLANT CONCEPT



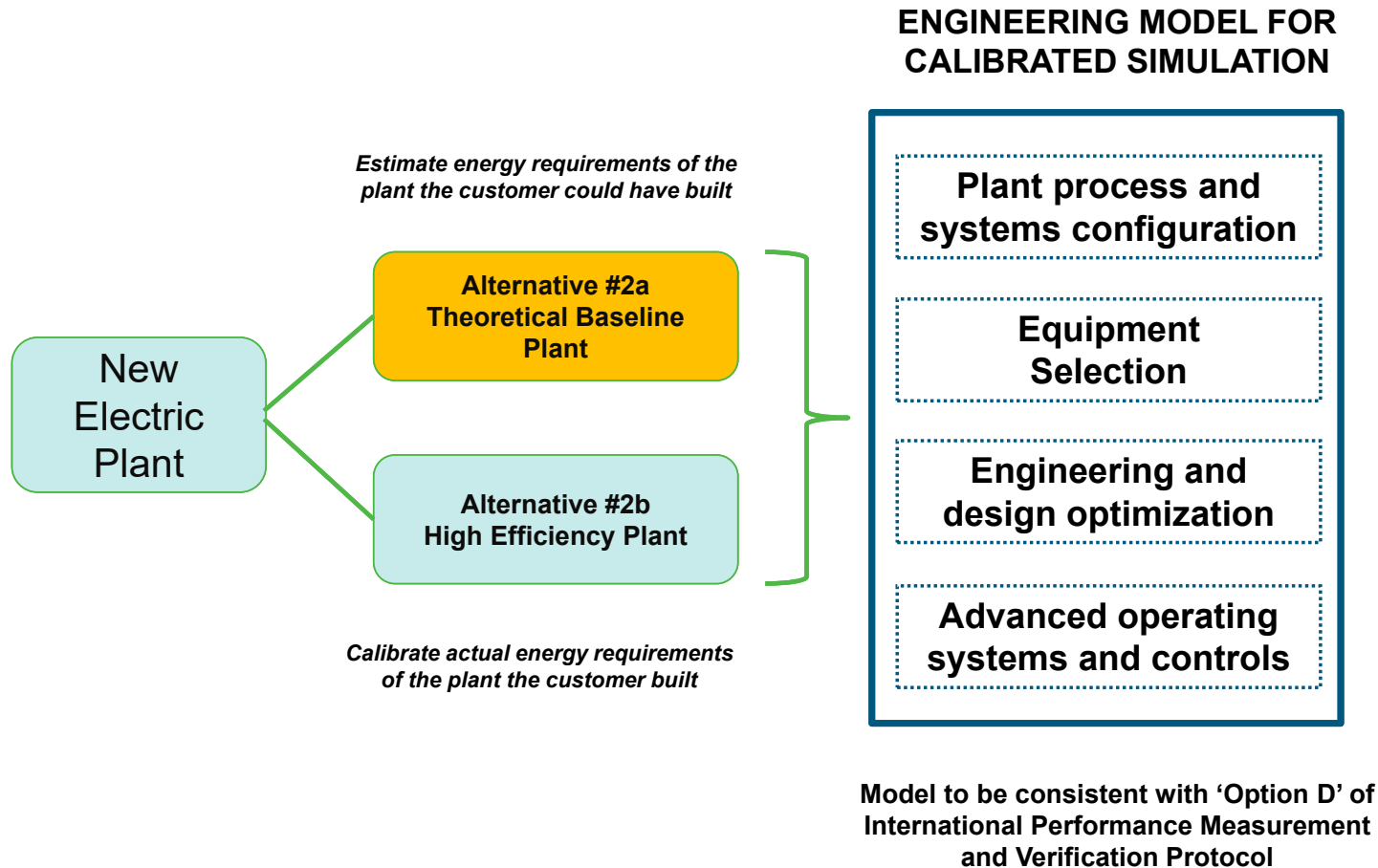
CUSTOMER-FUNDED DSM: ILLUSTRATIVE EXAMPLE

BCH system



TYPICAL ENERGY CONSERVATION MEASURES	
1	Efficient compressor design / process configuration
2	Variable Frequency Drives
3	Premium efficiency motors
4	Larger diameter pipeline (reduce inlet compression)
5	Larger conductor for transmission line
6	Efficient transformer

EFFICIENT NEW PLANT CONCEPT



EFFICIENT NEW PLANT: PROPOSED CRITERIA

EFFICIENT NEW PLANT

CBL CREDIT ADJUSTMENT FOR VERIFIED CUSTOMER-FUNDED DSM

1. **Submit initial Stage 3 Review - Impact Study in accordance with Section 6.1.4 of TS 74, within 18 months of plant in-service. Submission must clearly identify the efficient design alternatives and electrical energy savings for the efficient new plant as compared to the theoretical baseline plant**
2. Theoretical Baseline plant: (i) reflects use of standard technology that is currently available, technically and financially viable; and (ii) is capable of achieving a similar level of production and quality as the efficient new plant
3. Impact Study to be consistent with Option D of IPMVP Protocol (Calibrated Simulation) and include model to show engineering calculations for determination of energy savings
4. Submit updated Impact Study each year by June 30th. **Minimum annual electrical energy savings must be >10 GWh/yr (and must be maintained each year to qualify)**
5. Custom duration that is determined by BC Hydro for the efficient new plant (not to exceed 20yrs) will be applied to all energy conservation measures that comprise the efficient new plant and remain subject to BCUC approval

Do you agree with the proposed cap of 20 years for determination of a custom Customer-funded DSM Duration?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

Do you agree with BC Hydro's proposed new tariff provision for efficient new plant?

Yes

No

Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app

VERIFICATION OF ENERGY CONSUMPTION IMPACTS

ANNUAL VERIFICATION

PROVISION FOR SUBMITTING CBL CLAIMS

Existing Section 6.1 Verification of Energy Consumption Impacts

6.1.3 To initiate the Engineering Review of a project or event specified in section 6.1.2, the customer must provide BC Hydro with a completed claim for review **by June 30th of each year**. The claim must include a Declaration of the estimated energy consumption impact of the project or event, the best available supporting background and technical documentation related to the project or event, and must be signed by a Professional Engineer (P.Eng), Certified Measurement and Verification Professional, or Officer of the Company. **For greater certainty, where BC Hydro has advised the customer that a project or event is subject to annual verification, and the customer does not submit a completed claim by June 30th, BC Hydro may set the verified energy consumption impact of the project or event to zero for that year.**

Do you agree with BC Hydro's proposal for submission of verification documents for CBL annual review by June 30th of each year?

Yes
No
Unsure

Start the presentation to see live content. Still no live content? Install the app or get help at PollEv.com/app



**BC Hydro Rate Schedules 1823 and 1828
Billing Demand Interpretation for Customers
Served under Rate Schedules 1892 and 1893**

Attachment 4

**BC Hydro Letters to RS 1892
Freshet Rate Customers**

23rd April, 2024

Attention: Customer Name

VIA Email: [Customer Email](#)

Customer Account #:

Re: Billing Demand for the Freshet Energy Rate (RS 1892)

Dear Customer,

Thank you for your notice of intent to participate in the Freshet Energy rate (RS 1892) for the period from May 1 to July 31, 2024.

BC Hydro has recently become aware of an error on our part in how Billing Demand was determined for customers under RS 1823 and RS 1828 while participating in the Freshet Energy rate in previous years. BC Hydro will soon be filing a submission with the British Columbia Utilities Commission (BCUC) in that regard.

In the meantime, BC Hydro is providing this notice to clarify how Billing Demand will be determined for your site (or "Customer Plant") under RS 1823, while participating in the Freshet Energy rate starting May 1, 2024.

In accordance with the applicable rate schedules that have been filed with and approved by the BCUC, Billing Demand under RS 1823 for customers also receiving service under the Freshet Energy rate during the upcoming freshet period will be the highest of the following:

(a) The lesser of:

1) The Reference Demand; and

2) The actual highest kVA Demand during the High Load Hours in the Billing period;
or

(b) 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February (both months included); or

(c) 50% of the Contract Demand stated in the Electricity Supply Agreement for the Customer's Plant.

Please don't hesitate to contact us if you have any questions.

23rd April, 2024

Attention: Customer Name

VIA Email: [Customer Email](#)

Customer Account #:

Re: Billing Demand for the Freshet Energy Rate (RS 1892)

Dear Customer,

Thank you for your notice of intent to participate in the Freshet Energy rate (RS 1892) for the period from May 1 to July 31, 2024.

BC Hydro has recently become aware of an error on our part in how Billing Demand was determined for customers under RS 1823 and RS 1828 while participating in the Freshet Energy rate in previous years. BC Hydro will soon be filing a submission with the British Columbia Utilities Commission (BCUC) in that regard.

In the meantime, BC Hydro is providing this notice to clarify how Billing Demand will be determined for your site (or "Customer Plant") under RS 1830, while participating in the Freshet Energy rate starting May 1, 2024.

In accordance with the applicable rate schedules that have been filed with and approved by the BCUC, Billing Demand under RS 1830 for customers also receiving service under the Freshet Energy rate during the upcoming freshet period will be the highest of the following:

(a) The lesser of:

1) The Reference Demand; and

2) The actual highest kVA Demand during the High Load Hours in the Billing period;
or

(b) 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February (both months included); or

(c) 50% of the Contract Demand stated in the Electricity Supply Agreement for the Customer's Plant.

Please don't hesitate to contact us if you have any questions.

23rd April, 2024

Attention: Customer Name

VIA Email: [Customer Email](#)

Customer Account #:

Re: Billing Demand for the Freshet Energy Rate (RS 1892)

Dear Customer,

Thank you for your notice of intent to participate in the Freshet Energy rate (RS 1892) for the period from May 1 to July 31, 2024.

BC Hydro has recently become aware of an error on our part in how Billing Demand was determined for customers under RS 1823 and RS 1828 while participating in the Freshet Energy rate in previous years. BC Hydro will soon be filing a submission with the British Columbia Utilities Commission (BCUC) in that regard.

In the meantime, BC Hydro is providing this notice to clarify how Billing Demand will be determined for your site (or "Customer Plant") under RS 1828, while participating in the Freshet Energy rate starting May 1, 2024.

In accordance with the applicable rate schedules that have been filed with and approved by the BCUC, Billing Demand under RS 1828 for customers also receiving service under the Freshet Energy rate during the upcoming freshet period will be the highest of the following:

(a) The lesser of:

- 1) The Reference Demand; and
- 2) The actual highest kVA Demand during the High Load Hours in the Billing period;
or

(b) 75% of the highest Billing Demand for the Customer's Plant in the immediately preceding period of November to February (both months included); or

Please don't hesitate to contact us if you have any questions.