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October 31, 2023

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: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application
Compliance with BCUC Order No. G-256-20 Directive 2

BC Hydro writes in compliance with Directive 2 of BCUC Order No. G-256-20 to provide the evaluation report on Rate Schedule 1893 – Transmission Service – Incremental Energy Rate for the period from January 1, 2020 to March 31, 2023.¹

BC Hydro's Incremental Energy Rate was approved on October 14, 2020 as a pilot program by BCUC Order No. G-256-20 effective from January 1, 2020 to March 31, 2024. Customers taking service under Rate Schedule 1823 – Transmission Service – Stepped Rate and Rate Schedule 1828 – Transmission Service – Biomass Energy Program are eligible to take service under the Incremental Energy Rate on an optional basis for electricity usage above pre-determined monthly baselines for energy and demand. Energy pricing is referenced to daily Mid-Columbia (**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.

Next Steps for the Incremental Energy Rate

BC Hydro is not planning to seek BCUC approval to offer Rate Schedule 1893 as a permanent rate offering effective April 1, 2024 (i.e., at the end of the current pilot period). In BC Hydro's view, a decision on whether to seek BCUC approval for a permanent rate offering requires more certainty regarding the new default transmission

¹ Order No. G-256-20 contemplated a report that covered the period from January 1, 2020 to December 31, 2022. In BC Hydro's extension request letter dated September 8, 2023, we noted that an extension of the evaluation report would allow for the evaluation report to cover three full fiscal years of implementation (i.e., from January 1, 2020, to March 31, 2023, which covers fiscal 2021, fiscal 2022 and fiscal 2023).

service rate², further consideration of BC Hydro's current energy planning context³, and additional consultation. However, BC Hydro may seek BCUC approval to extend the pilot period and continue to offer Rate Schedule 1893 on a temporary basis.

To inform and advance these decisions, BC Hydro plans to:

- Consult with transmission service customers early in the new year to determine whether Rate Schedule 1893 should be extended for an additional year on a temporary basis (i.e., fiscal 2025);
- Inform the BCUC whether we will be requesting to extend Rate Schedule 1893 for fiscal 2025 on a temporary basis by February 15, 2024; and
- Consider the evaluation results within BC Hydro's current energy planning context and carry out engagement with customers and interested parties on potential changes or refinements to the rate (if applicable) during fiscal 2025.

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

Yours sincerely,



Chris Sandve
Chief Regulatory Officer

jl/ma

Enclosure

² Uncertainty with respect to the final outcome(s) of a BCUC decision on BC Hydro's Transmission Service Rate Design Application may present practical challenges with respect to assessing the potential benefits and customer participation levels going forward. Certainty with respect to the underlying default transmission service rate would help inform any changes or refinements to Rate Schedule 1893 as a potential permanent offering.

³ As Rate Schedule 1893 is meant to encourage incremental consumption when market prices are low (i.e., to encourage domestic use when market prices are low without harming other ratepayers), it is prudent to re-consider the relevance of and benefits offered by the rate within BC Hydro's current energy planning context which has changed since the pilot was developed. For more information on BC Hydro's current energy planning context, refer to BC Hydro's updated load resource balance as provided in BC Hydro's Signpost Update in the 2021 Integrated Resource Plan proceeding (Exhibit B-39).

**BC Hydro Transmission Service Market Reference
Priced Rates Application
Compliance with BCUC Order No. G-256-20
Directive 2**

Evaluation Report on Rate Schedule 1893

October 31, 2023

PUBLIC

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1 Executive Summary

2 BC Hydro's Rate Schedule (**RS**) 1893 – Transmission Service – Incremental Energy
3 Rate (**Incremental Energy Rate** or **RS 1893**) was approved on October 14, 2020 as
4 a pilot program effective from January 1, 2020 to March 31, 2024 (**Incremental**
5 **Energy Rate Pilot** or **Pilot**) by British Columbia Utilities Commission (**BCUC** or **the**
6 **Commission**) Order No. G-256-20. Customers taking service under RS 1823 –
7 Transmission Service – Stepped Rate and RS 1828 – Transmission Service –
8 Biomass Energy Program are eligible to take service under the Incremental Energy
9 Rate on an optional basis for electricity usage above pre-determined monthly
10 baselines for energy and demand. The Incremental Energy Rate is offered to
11 transmission service customers on a non-firm, interruptible and year-round basis.
12 Energy pricing is referenced to daily Mid-Columbia (**Mid-C**) market prices, plus an
13 additional energy charge adder for margin and risk of \$7/MWh in non-freshet months
14 and \$3/MWh in freshet months.

15 Direction 2 of BCUC Order No. G-256-20 directed BC Hydro to file with the British
16 BCUC an evaluation report on RS 1893 by September 15, 2023, for the period from
17 January 1, 2020 to December 31, 2022.¹

18 In the Transmission Service Market Reference-Priced Rates Application (**the**
19 **Application**), BC Hydro proposed that the evaluation would consider the following:

- 20 (i) Ratepayer and participant economics;
- 21 (ii) Appropriateness of the energy charge adder;
- 22 (iii) Customer understanding and acceptance;
- 23 (iv) Practicality of administration; and

¹ BC Hydro requested an extension of the deadline to file its evaluation report from September 15, 2023 to October 31, 2023, which was approved by the BCUC on September 11, 2023.

- 1 (v) Interactions and possible opportunities for synergies between the Incremental
2 Energy Rate Pilot and the Freshet Rate.

3 The Panel accepted BC Hydro's proposed evaluation and reporting items which
4 were outlined in detail in section 5.7 of the Application and directed BC Hydro to
5 address additional items as part of the evaluation process.

6 Specifically, Directive 2 of BCUC Order No. G-256-20 requires that BC Hydro also
7 provide information about its system marginal values as part of the evaluation report
8 to the BCUC. The Reason for Decision provides further explanation:

9 "With respect to providing information about the system
10 marginal value of BC Hydro's resources, the Panel agrees with
11 BC Hydro that revealing such information publicly may
12 compromise energy trade. However, the concern stems from
13 whether the [Incremental Energy Rate] energy charge adders
14 are appropriate to ensure that a net benefit will be generated
15 from the [Incremental Energy Rate]. If BC Hydro has concerns
16 regarding the confidentiality of this information, it can file the
17 information with the BCUC on a confidential basis, if needed."

18 BC Hydro is filing this Incremental Energy Rate Pilot Evaluation Report in
19 compliance with Directive 2 of BCUC Order No. G-256-20.

20 **1.1 Pilot Objectives**

21 Like the Transmission Service – Freshet Energy rate (RS 1892), the Incremental
22 Energy Rate Pilot was designed to:

- 23 (a) Provide opportunities for transmission service customers to operate their idle
24 and/or flexible production capacity that in the absence of these rates would be
25 underutilized;

- 1 (b) Provide benefits to all ratepayers by setting pricing that is generally sufficient to
2 cover, on an expected basis, BC Hydro's marginal cost of energy² and make
3 some contribution to fixed costs;³
- 4 (c) Minimize risk to all ratepayers by not requiring BC Hydro to undertake system
5 reinforcements and not requiring BC Hydro to provide service if the electrical
6 system is constrained for technical reasons such as forced or planned outages
7 of its transmission or generation system. For greater certainty, BC Hydro did
8 not propose to interrupt these non-firm services for economic reasons; and
- 9 (d) Minimize risk to participating customers by making these rates optional and
10 continuing to provide participating customers with firm service at stable pricing
11 under RS 1823 or RS 1828, as applicable.

12 The Incremental Energy Rate was designed to provide non firm, interruptible
13 electricity that is available to all RS 1823 and RS 1828 transmission customers on a
14 year-round basis.⁴ BC Hydro had received requests for flexible rate options from
15 transmission service customers that better match their unique operating needs and
16 electricity service requirements and the Incremental Energy Rate was developed in
17 response to the feedback.

18 The Incremental Energy Rate was also responsive to the 2013 Industrial Electricity
19 Policy Review (**IEPR**) task force recommendations⁵ to develop innovative rate

² BC Hydro uses "system marginal value" as its marginal cost of energy for incremental sales. The system marginal value represents the estimated marginal value of energy in the system, which is typically the expected value of generation from one of BC Hydro's large storage reservoirs. BC Hydro's analysis takes into account uncertainties in various inputs such as forecasted inflows, electricity and gas prices, loads and operational constraints. The rates have been designed to cover the marginal cost of energy and provide a contribution to fixed costs on an expected value basis (determined by positive expected net revenue in the analysis), which is determined by the probability weighted average of all values.

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

⁴ The Freshet Energy rate (RS 1892) provides non-firm, interruptible electricity during the freshet months only (May to July).

⁵ Recommendation 13 of the IEPR task force final report stated, "BC Hydro should work with its industrial customers and the BCUC to develop options that take advantage of industrial power consumption flexibility".

1 options for industrial customers and to recover what BC Hydro would otherwise
2 obtain on the export market from surplus sales, but with potential economic benefits
3 to B.C.

4 **1.2 Overview of Pilot Results**

5 BC Hydro has structured the reporting of the results of the Incremental Energy Rate
6 Pilot as follows:

- 7 • The partial fiscal year 2020, from January 1, 2020, to March 1, 2021, defined as
8 the “Initial Period”; and
- 9 • Each of the three full fiscal years (fiscal 2021, fiscal 2022 and fiscal 2023).

10 BC Hydro considers that the Incremental Energy Rate had a modest degree of
11 success in achieving the objectives set out in section [1.1](#), over the three-month initial
12 period and the following three fiscal years of the Pilot. Key success metrics are:

- 13 1. Customer take-up/participation;
- 14 2. Incremental energy sales and revenue; and
- 15 3. Positive ratepayer impact.

16 Each of these success metrics are discussed in the sub-sections below. In
17 summary, the Pilot:

- 18 (i) Achieved participation from approximately 10% of eligible customers in the
19 transmission service class;
- 20 (ii) Increased domestic energy sales by 520 GWh and revenue by \$28.7 million
21 from participant customers; and
- 22 (iii) Had an estimated positive ratepayer impact of \$4.78 million after adjustment for
23 all verified costs.

1 1.2.1 Customer Participation

2 The rate had a moderate level of customer participation from a broad
3 cross-section of industry.

4 There were 13 participant customer sites in the Initial Period (January 1, 2020 to
5 March 31, 2020), 17 participants in fiscal 2021 (April 1, 2020 to March 31, 2021),
6 15 participants in fiscal 2022 (April 1, 2021 to March 31, 2022) and 13 participants in
7 fiscal 2023 (April 1, 2022 to March 31, 2023). This level of participation represents
8 approximately 10% of eligible sites across the entire pool of eligible RS 1823
9 transmission service customers (total of approximately 150 sites). BC Hydro did not
10 curtail RS 1893 service to any customer during the Pilot, as sufficient energy and
11 capacity were available to serve the incremental load.

12 Customer participation in the Incremental Energy Rate Pilot was driven by
13 economics. When Mid-C market prices were favourable, customers took action to
14 increase consumption. Actions taken were operational in nature, using existing plant
15 and equipment. Based on survey responses from participating customers, no
16 participant customers made capital investments or permanent operating changes.

17 Participating customers representing the pulp and paper and electrochemical
18 sectors were highly sensitive to daily market prices, whereas the mining customer
19 participants took a longer-term view. When Mid-C market prices escalated, the rate
20 economics were challenged. In fiscal 2022 and fiscal 2023, high Mid-C market prices
21 led to the majority of customers requesting service cancellation under this rate by
22 the mid-way point of the year. Participating customers provided feedback to
23 BC Hydro regarding certain aspects of the rate and feedback on their experience
24 with the rate is summarized below⁶:

25 “Add provisions for customers with self-generation to address
26 the treatment of major generating plant outages.”

⁶ Please refer to [Appendix C](#) for a copy of the survey questions that were issued to participating customers.

1 “Reduce the energy charge adder to make the rate more
2 competitive.”

3 “Apply a ceiling price (such as the Tier 2 rate), consistent with
4 the floor price concept.”

5 “Provide an on-ramp mechanism to enable a quicker return to
6 the rate if customers were forced to exit/cancel during the year
7 based on extreme market prices.”

8 A representative selection of feedback on the experience of participating customers
9 is summarized below:

10 “We commend BC Hydro’s efforts to expeditiously develop and
11 introduce the IER pilot as well as communicating the daily
12 pricing information concisely and in a timely fashion. We
13 strongly believe that the Incremental Energy Rate Pilot has been
14 a win-win-win program for (participant) customers, BC Hydro
15 and rate-payers. The rate provides additional revenues as
16 opportunity sales to BC Hydro which offset costs and provides
17 system-wide benefits, and it allows participating customers
18 greater control over managing their costs. We support and
19 advocate that the IER pilot be made permanent going forward.”

20 “The rate pilot was extremely beneficial. We delivered what we
21 expected, we increased energy purchases when it was
22 favourable, and reduced our fuel costs. Unfortunately, there is
23 no provision for a major authorized planned outage of our
24 generating equipment which forced us to opt out of the program.
25 We also had difficulties operating to our baseline during winter
26 conditions due to the loss of a power boiler that reduced our
27 ability to increase generation. We became more at risk to higher
28 Mid-C pricing.”

29 “We were happy with the performance of our operations to
30 respond to the Mid-C price signals. The volatility of the Mid-C
31 price is our biggest challenge to try and determine a monthly
32 focus on what we want to achieve.”

33 Collectively, BC Hydro considers that the results and customer feedback provided
34 indicate support for the rate from participating customers.

1 **1.2.2 Incremental Energy Sales and Revenue**

2 The rate resulted in incremental energy sales and revenue during the Initial Period
3 and subsequent three fiscal years of the Pilot. Refer to [Table 1](#) below. Total
4 RS 1893 energy sales were 50 GWh in the Initial Period, 188 GWh in fiscal 2021,
5 140 GWh in fiscal 2022 and 142 GWh in fiscal 2023. Over the 39-month period of
6 the Pilot covered by the evaluation, total RS 1893 energy sales were 520 GWh and
7 total RS 1893 revenue was \$28.7 million.

8 **Table 1 Summary of Incremental Sales and**
9 **Revenue**

	Initial Period Jan-Mar 2020	Year 1 F2021	Year 2 F2022	Year 3 F2023	Total
Total number of participant customer sites	13	17	15	13	
RS 1893 energy sales (MWh)	50,768	187,521	140,365	141,591	520,245
Average incremental load (Average MW/hr)	23	21	16	16	
Average unit cost of market-priced energy (C\$/MWh)	28.35	24.46	56.16	87.16	
RS 1893 market-priced energy revenue (\$M)	1.44	4.59	7.88	12.34	26.25
Plus \$3/MWh adder (\$M)	-	0.25	0.20	0.24	0.69
Plus \$7/MWh adder (\$M)	0.36	0.73	0.51	0.44	2.04
Plus deferral account rate rider of (2%) in F2023 (\$M)	-	-	-	(0.26)	(0.26)
Total RS 1893 revenue (excluding taxes) (\$M)	1.80	5.57	8.59	12.76	28.72

10 **1.2.3 Positive Ratepayer Benefit**

11 A core design objective of the Incremental Energy Rate was that all ratepayers
12 should be held harmless. BC Hydro confirms that this objective was achieved. The
13 rate resulted in positive benefits to non-participant ratepayers in each year of the
14 Pilot based on directly attributable costs.

15 The benefit to non-participants is based on an economic analysis performed by
16 BC Hydro of daily system operations during the Pilot period. The analysis considers,

1 on a daily time-step basis (i.e., hourly), whether BC Hydro gained or lost revenue by
2 selling incremental energy to domestic customers under RS 1893. It considers the
3 marginal resource used to serve RS 1893 energy volumes during each day of the
4 Pilot period in both High Load Hours (**HLH**) (on-peak hours) and Low Load Hours
5 (**LLH**) (off-peak hours). BC Hydro's preliminary (unadjusted) gross estimate of
6 ratepayer benefit is \$5.3 million for the Pilot period, which is shown in the second
7 row of [Table 2](#).

8 BC Hydro has further adjusted this estimate to account for additional verified costs,
9 including: (1) implementation costs; and (2) verified load shifting costs (i.e., revenue
10 impact). BC Hydro's estimate of load shifting includes customer-reported events of
11 load-shifting, natural load growth and use of RS 1893 as a replacement service for
12 RS 1880 during events of forced generator outage.

13 BC Hydro's adjusted estimate of ratepayer benefit for the Pilot is \$4.8 million, as
14 shown in [Table 2](#) below. BC Hydro considers this adjusted value to reflect a positive
15 net benefit to ratepayers.

1 **Table 2 Adjusted Ratepayer Benefit by Pilot Year**

Adjusted Ratepayer Benefit	Initial Period Jan-Mar 2020 (\$000)	Year 1 F2021 (\$000)	Year 2 F2022 (\$000)	Year 3 F2023 (\$000)	Totals (\$000)
Preliminary ratepayer benefit ⁷	298	2,538	1,523	906	5,265
Less implementation costs ⁸	-	(129)	(5)	(4)	(138)
Less customer-reported load shift impact	-	-	-	-	-
Less natural load growth impact	-	(172)	(4)	-	(176)
Less RS 1880 replacement service impact	-	(166)	-	-	(166)
Adjusted Ratepayer Benefit	298	2,071	1,514	904	4,785

2 **2 Evaluation Scope and Report Structure**

3 BCUC Order No. G-256-20 directed BC Hydro to file an evaluation report on
4 RS 1893 by September 15, 2023, for the period from January 1, 2020 to
5 December 31, 2022. BC Hydro requested an extension of the deadline to file the
6 evaluation report from September 15, 2023 to October 31, 2023, which was
7 approved by the BCUC on September 11, 2023. In its extension request, BC Hydro
8 noted that the extension would allow for the evaluation report to cover three full
9 fiscal years of implementation (i.e., from January 1, 2020, to March 31, 2023, which
10 covers fiscal 2021, fiscal 2022 and fiscal 2023).

11 BC Hydro’s proposed evaluation and reporting items were outlined in detail in
12 section 5.7 of the Application. BCUC Order No. G-256-20 accepted the proposed
13 evaluation and reporting items and directed BC Hydro to address additional items as
14 part of the evaluation process. The remainder of the evaluation report is structured
15 as follows:

⁷ For additional information on the calculation of preliminary ratepayer benefit, refer to section [3.1.4](#).

⁸ For additional information on the implementation costs associated with the Pilot, refer to section [3.1.5.1](#).

-
- 1 • Section [3](#) provides the evaluation results, structured into the following
2 sub-sections according to the evaluation criteria:
- 3 ▶ Section [3.1](#): Ratepayer and participant economics;
- 4 ▶ Section [3.2](#): Appropriateness of the energy charge adder;
- 5 ▶ Section [3.3](#): Customer understanding and acceptance;
- 6 ▶ Section [3.4](#): Practicality of administration; and
- 7 ▶ Section [3.5](#): Interactions and possible synergies with other non-firm rates.
- 8 • [Appendix A](#) provides a detailed comparison of RS 1893 and RS 1823 energy
9 prices for each year of the Pilot;
- 10 • [Appendix B](#) contains additional information regarding BC Hydro's system
11 marginal values, and is being filed on a confidential basis with the BCUC; and
- 12 • [Appendix C](#) contains a copy of the survey questions that were issued to
13 participating customers.

14 The concordance table shown in [Table 3](#) below identifies the specific section of the
15 evaluation report where each of the evaluation items set forth in section 5.7 of the
16 Application and BCUC Order No. G-256-20 has been addressed.

1

Table 3 Concordance Table

Evaluation Criteria	Section
Section 5.7 of Transmission Service Market Reference Priced Rates Application	
(a) Estimates of the costs and benefits of the Incremental Energy Rate Pilot. This will be determined on an overall ratepayer basis, and will employ the same economic analysis approach used in the Freshet Rate evaluation reports;	Sections 3.1.3 to 3.1.5
(b) Estimate of participant benefit based on the unit cost reduction of incremental electricity;	Section 3.1.3
(c) Estimate of incremental energy sales and revenue;	Section 3.1.2
(d) Assessment of whether risk mitigation measures such as the energy charge adder were sufficient to protect non-participants from harm;	Section 3.2
(e) Tracking of number of existing and new RS 1823 customers and RS 1828 customers that used the rate and volumes of use;	Sections 3.1.1 to 3.1.2
(f) Assessment of customer use of the rate and determination of customer load response to Mid-C electricity prices;	Section 3.3.1
(g) Assessment of any implementation issues – such as baseline determination, customer communication, and billing of incremental energy;	Sections 3.4.1 to 3.4.2
(h) Assessment of customer satisfaction regarding the rate;	Section 3.3.2
(i) Review any interruption of customers under non-firm provisions of the rate;	Section 3.4.3
(j) Assessment of the impact of self-generation outages and/or curtailments and whether customers used the rate as a substitute for RS 1880;	Section 3.5.1
(k) Examination of whether load shifting by customers occurred and an assessment of the impact;	Section 3.1.5
(l) Assessment of the usage of the Incremental Energy Rate Pilot compared to the usage of the Freshet Rate during the freshet period; and	Section 3.5.2
(m) Assessment of the Incremental Energy Rate Pilot impact on RS 1892 and RS 1880 service options to determine if BC Hydro should continue to offer multiple optional non-firm rates or a single non-firm service.	Sections 3.5.1 and 3.5.3
Directive 2 of BCUC Order No. G-256-20	
BC Hydro is directed to provide information about its system marginal values as part of the evaluation report to the BCUC.	Appendix B

1 **3 Pilot Evaluation Criteria**

2 **3.1 Ratepayer and Participant Economics**

3 The Incremental Energy Rate had a small positive benefit to non-participant
4 ratepayers in each year of the Pilot based on directly attributable costs. The benefit
5 to participants was generally positive, however, this was highly dependent on the
6 average RS 1893 energy price. High RS 1893 prices (Mid-C plus adder) resulted in
7 a large number of customers opting out of the rate in Years 2 and 3.

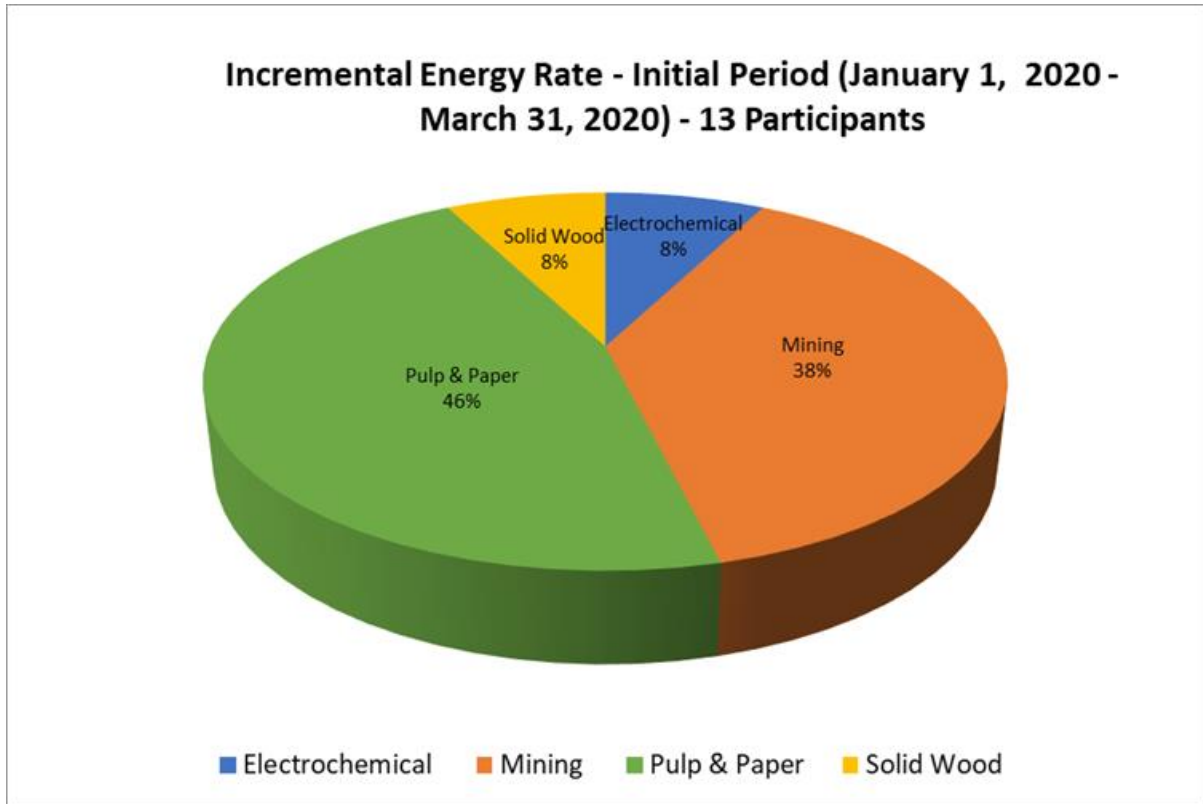
8 **3.1.1 Customer Participation**

9 The rate had a moderate level of customer participation from a broad
10 cross-section of industry. Refer to [Figure 1](#) below.

11 There were 13 participant customer sites in the Initial Period (January 1, 2020 to
12 March 31, 2020), 17 participants in fiscal 2021 (April 1, 2020 to March 31, 2021),
13 15 participants in fiscal 2022 (April 1, 2021 to March 31, 2022) and 13 participants in
14 fiscal 2023 (April 1, 2022 to March 31, 2023) with representation in each year from
15 customers served under RS 1823 – Stepped Rate and RS 1828 – Biomass Energy
16 Program. This level of participation represents approximately 10% of eligible sites
17 across the entire pool of eligible RS 1823 and RS 1828 transmission service
18 customers (total of approximately 150 sites).

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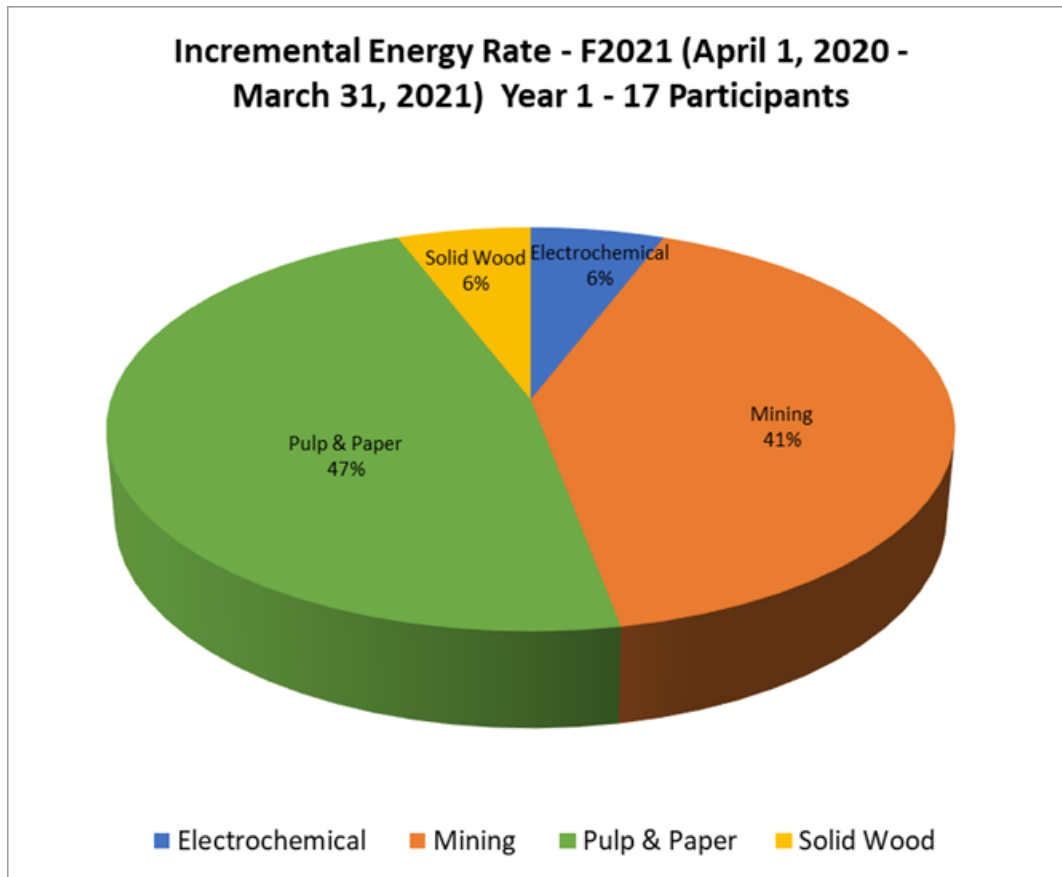
Figure 1 Customer Site Participants by Industry Sector, Initial Period



3 Thirteen unique transmission customer sites from across the province participated in
4 the Initial Period of the Pilot. No customers opted out.

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Figure 2 Customer Site Participants by Industry Sector, Fiscal 2021

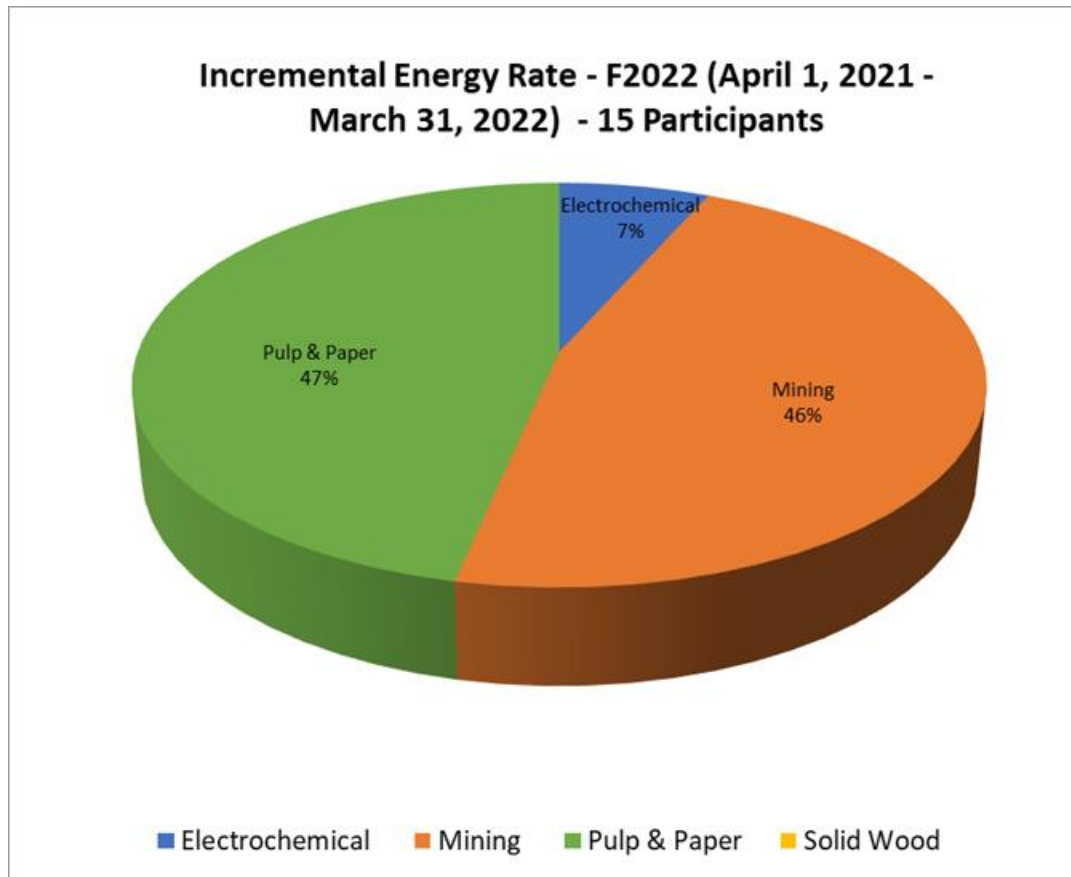


3 Seventeen unique transmission customer sites from across the province participated
4 in Year 1 (fiscal 2021) of the Pilot. Three customers subsequently opted out of
5 Year 1, reducing the total number of participant sites to 14:

- 6 • Two of the three customers requested for service under RS 1880 (one in
7 October 2020 and the other in February 2021), therefore supply under RS 1893
8 was automatically cancelled for the remainder of the Billing Year; and
- 9 • One customer opted out in August 2020 due to high Mid-C prices.

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Figure 3 Customer Site Participants by Industry Sector, Fiscal 2022



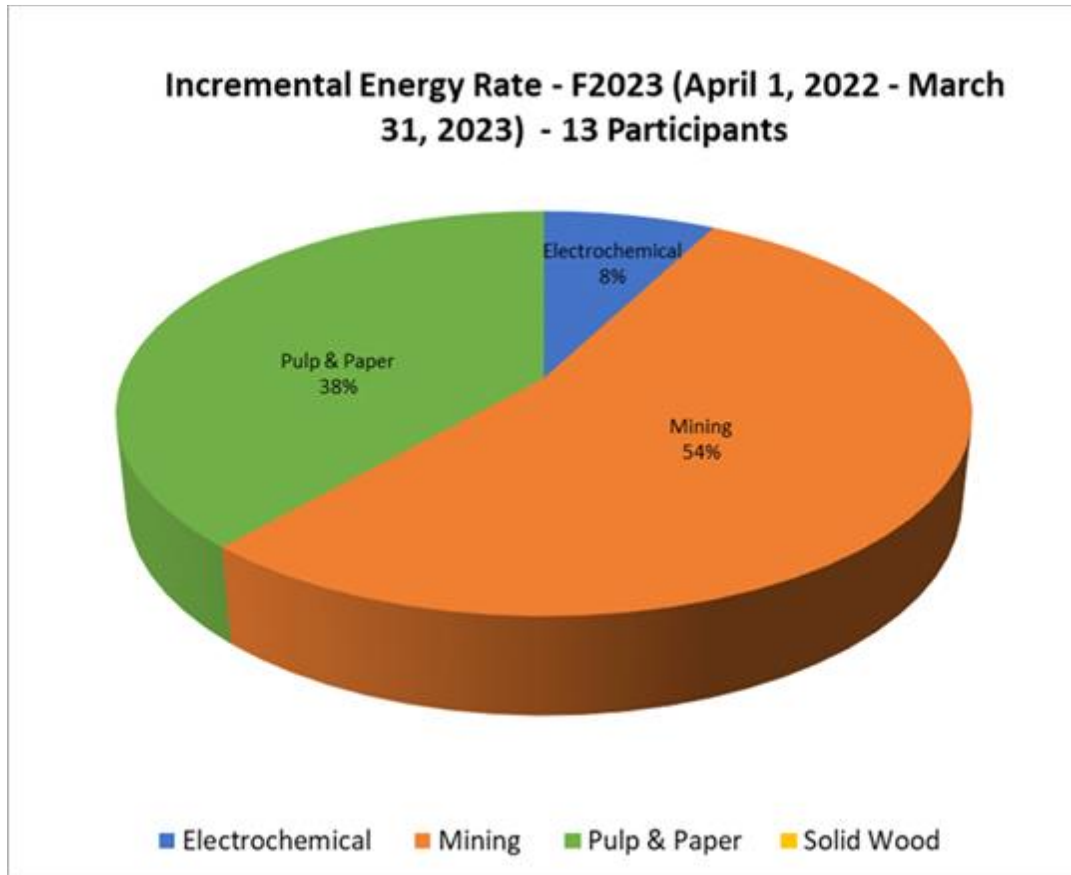
3 Fifteen unique transmission customer sites from across the province participated in
4 Year 2 (Fiscal 2022) of the Pilot. Twelve customers subsequently opted out of
5 Year 2, reducing the total number of participant sites to three:

- 6 • Seven customers opted out in July 2021;
- 7 • Four customers opted out in September 2021; and
- 8 • One customer opted out in October 2021.

9 All 12 customers opted out due to high Mid-C market prices.

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Figure 4 Customer Site Participants by Industry Sector, Fiscal 2023



3 Thirteen unique transmission customer sites from across the province participated in
4 Year 3 (Fiscal 2023) of the Pilot. Nine customers subsequently opted out of Year 3,
5 reducing the total number of participant sites to four:

- 6 • One customer opted out in July 2022;
- 7 • Six customers opted out in August 2022;
- 8 • One customer opted out in September 2022; and
- 9 • One customer opted out in October 2022.

10 All nine customers opted out due to high Mid-C market prices.

1 **3.1.2 Incremental Energy Sales and Revenue**

2 The rate resulted in incremental energy sales and revenue during the Initial Period
3 and subsequent three fiscal years of the Pilot. Refer to [Table 4](#) below. Total
4 RS 1893 energy sales were 50 GWh in the Initial Period, 188 GWh in fiscal 2021,
5 140 GWh in fiscal 2022 and 142 GWh in fiscal 2023. Over the 39-month period of
6 the Pilot covered by the evaluation, total RS 1893 energy sales were 520 GWh and
7 total RS 1893 revenue was \$28.7 million.

8 **Table 4 Summary of Incremental Sales and**
9 **Revenue**

	Initial Period Jan-Mar 2020	Year 1 F2021	Year 2 F2022	Year 3 F2023	Total
Total number of participant customer sites ⁹	13	17	15	13	
RS 1893 energy sales (MWh)	50,768	187,521	140,365	141,591	520,245
Average incremental load (Average MW/hr)	23	21	16	16	
Average unit cost of market-priced energy (C\$/MWh)	28.35	24.46	56.16	87.16	
RS 1893 market priced energy revenue (\$M)	1.44	4.59	7.88	12.34	26.25
Plus \$3/MWh adder (\$M)	-	0.25	0.20	0.24	0.69
Plus \$7/MWh adder (\$M)	0.36	0.73	0.51	0.44	2.04
Plus deferral account rate rider of (2%) in F2023 (\$M)	-	-	-	(0.26)	(0.26)
Total RS 1893 revenue (excluding taxes) (\$M)	1.80	5.57	8.59	12.76	28.72
Average total unit cost of market-priced energy including adder and rate rider, excluding taxes ¹⁰ (\$/MWh)	35.3	29.7	61.2	90.1	

⁹ The total number of participant customer sites represents customers served under both RS 1823 and RS 1828.

¹⁰ RS 1893 energy revenue (after Adder and rate rider) divided by RS 1893 energy sales volume.

3.1.3 Benefit to Participants

Benefits to participants arise when the average unit price for RS 1893 electricity is lower than the average unit price for RS 1823 electricity. This lower price provides an incentive for participant customers to purchase incremental electricity thereby reducing their overall average unit cost of electricity.

[Table 5](#) shows that in the Initial Period of January through March 2020 and fiscal 2021 the average annual RS 1893 price (including adder) was lower than the RS 1823 Tier 1 energy price and the opposite was true in fiscal 2022 and fiscal 2023, when market prices were higher. Please refer to Appendix A which provides a more detailed comparison of RS 1893 and RS 1823 energy prices for each year of the Pilot.

Table 5 Comparison of RS 1893 and RS 1823 Energy Price (\$/MWh)

		Initial Period Jan-Mar 2020	F2021	F2022	F2023
1	Average weighted RS 1893 Energy Price (including adder)	34.92	36.96	67.41	134.81
2	RS 1823 Tier 1 energy price	45.35	44.62	45.07	45.35
3	RS 1823 Tier 2 energy price	101.60	99.95	100.95	101.58
4	RS 1823 Energy Charge A price	50.98	50.15	50.65	50.96
5	Energy price differential between RS 1893 and RS 1823 Tier 1 energy price	10.43	7.66	(22.34)	(89.46)

During the Pilot, participating RS 1893 customers had advance knowledge of day-ahead market prices for both HLH and LLH and could choose to use energy under RS 1893 when day-ahead market prices were economic relative to RS 1823 energy prices. Customers also realized RS 1823 demand savings in any Billing Period where actual metered demand in HLH was higher than their Monthly Reference Demand. Accordingly, it is BC Hydro’s view that the Incremental Energy Rate provided customers with a lower cost option for incremental electricity use for

1 the Initial Period and fiscal 2021. In fiscal 2022 and 2023, the average daily prices
2 for RS 1893 energy in HLH and LLH were much higher than the Initial Period and
3 fiscal 2021.

4 BC Hydro provides illustrative estimates of the total electricity cost reduction for
5 participants in [Table 6](#). These are based on two scenarios regarding the energy cost
6 reduction that participating customers may have which depends on the assumed
7 marginal price that they pay under RS 1823 (Stepped Rate). In the first scenario,
8 BC Hydro used the difference between the average RS 1893 unit energy price and
9 the RS 1823 Tier 1 unit energy price to estimate the average unit cost reduction for
10 incremental energy sales. In the second scenario, BC Hydro used the difference
11 between the average RS 1893 unit energy price and the RS 1823 Tier 2 unit energy
12 price to estimate the average unit cost reduction for incremental energy sales.

13 Actual results will differ on a customer-by-customer basis, as some participant
14 customers might have otherwise seen an RS 1823 Tier 2 energy price or RS 1880
15 energy price for incremental load, depending on their unique circumstances.

16 The estimated demand cost reduction is the RS 1823 demand charge cost saving,
17 since there is no demand charge applied to RS 1893 incremental load. It is
18 calculated by multiplying the average incremental load by the RS 1823 demand
19 charge and the number of months.

20 [Table 6](#) shows that in Scenario 1 participants had a cost reduction in both the Initial
21 Period and in fiscal 2021 but had increased total cost relative to under the RS 1823
22 Tier 1 energy price and demand charge in fiscal 2022 and fiscal 2023. In Scenario 2,
23 participants had a cost reduction in the Initial Period, fiscal 2021 and fiscal 2022 but
24 had increased total cost relative to under the RS 1823 Tier 2 energy price and
25 demand charge in fiscal 2023. These results explain the relatively high number of
26 participants opting out of the Pilot in fiscal 2022 and fiscal 2023, as shown in the
27 third row of the table. It should also be noted that the one-time ability to opt out prior

1 to the end of the month in which prices were high and revert to RS 1823 pricing
2 provided risk mitigation benefits to participating customers.

3 **Table 6 Illustrative Benefit for Participant**
4 **Customers**

	Initial Period Jan-Mar 2020	Year 1 F2021	Year 2 F2022	Year 3 F2023
Number of participants	13	17	15	13
Number of participants opting out	0	3	12	9
Estimated Energy Cost Reduction				
Average RS 1893 energy charge (includes adder) \$/MWh	34.92	36.96	67.41	134.81
RS 1823 Tier 1 energy charge \$/MWh	45.35	44.62	45.07	45.35
RS 1823 Tier 2 energy charge \$/MWh	101.60	99.95	100.95	101.58
Total RS 1893 energy sales (MWh)	50,768	187,521	140,365	141,591
Scenario 1 - Estimated energy cost reduction relative to RS 1823 Tier 1 (\$M)	0.53	1.44	-3.14	-12.67
Scenario 2 - Estimated energy cost reduction relative to RS 1823 Tier 2 (\$M)	3.39	11.81	4.71	-4.71
Estimated Demand Cost Reduction				
Average incremental load (Average MW/hr)	23	21	16	16
RS 1823 demand charge (\$/kVA)	8.697	8.556	8.642	8.71
Estimated Demand Charge Cost Reduction (\$M)	0.60	2.16	1.66	1.67
Estimated Total Cost Reduction				
Scenario 1 - total energy and demand cost reduction (relative to RS 1823 Tier 1) (\$M) – excludes rate rider and taxes	1.13	3.59	-1.48	-10.99
Scenario 2 - total energy and demand cost reduction (relative to RS 1823 Tier 2) (\$M) – excludes rate rider and taxes	3.39	13.97	6.37	-3.03

5 **3.1.4 Benefit to Non-Participants**

6 The estimated benefit to non-participant ratepayers is based on an economic
7 analysis performed by BC Hydro. Daily power supply operations were examined to
8 determine the marginal resource used to serve incremental RS 1893 energy
9 volumes during each day of the Pilot, in both HLH (on-peak hours) and LLH

1 (off-peak hours). The marginal resource used to serve RS 1893 energy on any given
2 day reflects one of the five conditions described below:

3 **Condition 1: Minimum generation¹¹ with forced exports**

4 When BC Hydro faces a minimum generation constraint and exports are forced in
5 order to avoid spill, incremental domestic sales under RS 1893 will reduce forced
6 exports. Holding market price constant, BC Hydro will see an approximate revenue
7 gain equal to the sum of the energy adder of \$3.00 CAD/MWh for the months of May
8 through July, or \$7.00 CAD/MWh for the rest of the year plus the avoided wheeling
9 fee (converted to Canadian dollars) for energy delivery from the BC border to the
10 Mid-C market plus transmission losses. The wheeling fee is \$5.32 USD/MWh for
11 January 2020 through September 2021 and \$5.65 USD/MWh otherwise. The
12 transmission loss is 1.9% for the period January 2020 through September 2021 and
13 1.95% otherwise. The overall gain for BC Hydro under this Condition is estimated to
14 be in the range of \$10.00 to \$14.00 CAD/MWh depending on the time of the year
15 and the applicable rates.

16 **Condition 2: Minimum generation with economic imports**

17 When BC Hydro experiences a minimum generation constraint, while importing on
18 an economic basis, incremental domestic sales under RS 1893 are deemed to be
19 served from market imports. Holding market price constant, BC Hydro will see an
20 approximate revenue loss equal to the difference between the RS 1893 energy
21 adder \$3.00 CAD/MWh for the months of May through July, or \$7.00 CAD/MWh for
22 the rest of the year and wheeling fee and transmission losses charge paid for energy
23 delivery from the Mid-C market to the BC border. This revenue loss is estimated to
24 be in the range of \$0 to \$4.00 CAD/MWh. On any day where the market price is
25 negative, the revenue loss from deemed market imports will be reduced by the

¹¹ If the system is operating exclusively on must-take energy, then it is considered to be operating at minimum generation.

1 difference between the actual market price and the \$0/MWh floor price under
2 RS 1893 (considered as market floor price differential in the calculations).

3 **Condition 3: Maximum generation¹² with resulting economic exports**

4 When BC Hydro is faced with a maximum generation constraint with net exports,
5 incremental domestic sales under RS 1893 will reduce resulting exports. Holding
6 market price constant, BC Hydro will see an approximate revenue gain equal to the
7 sum of the energy adder of \$3.00 CAD/MWh for the months of May through July
8 (which is unlikely), or \$7.00 CAD/MWh for the rest of the year plus the avoided
9 wheeling fee (converted to Canadian dollars) and the value of transmission loss for
10 avoided energy delivery from the BC border to the Mid-C market, which are based
11 on the same values illustrated in Condition 1 above. The anticipated gain when
12 factoring these three components is estimated to be in the range of \$10.00 to
13 \$14.00 CAD/MWh depending on the time of the year and the applicable rates.

14 **Condition 4: Maximum generation with forced imports**

15 When BC Hydro is experiencing a maximum generation constraint with resulting
16 imports (e.g., cold snap scenario), incremental domestic sales under RS 1893 are
17 deemed to be served from market imports. Holding market price constant, BC Hydro
18 will see an approximate revenue loss equal to the difference between the RS 1893
19 energy adder discussed above and wheeling fee and transmission losses charge
20 paid for energy delivery from the Mid-C market to the BC border. This loss is roughly
21 between \$0 to \$4.00 CAD/MWh. For any day where basin energy was deemed to
22 serve incremental RS 1893 loads, the difference between the value of actual
23 RS 1893 energy sales and BC Hydro's system marginal value is used to determine
24 the revenue gain or loss on that day.

¹² Maximum generation means the highest output level of a generating resource under normal operating conditions.

1 **Condition 5: Higher basin generation on the margin**

2 If the BC Hydro system is not exclusively under any of the four conditions discussed
 3 above and holding import/export volumes constant, the loading of BC Hydro's large
 4 basin generation will be increased to serve additional RS 1893 load. BC Hydro
 5 considers that the cost consequence (revenue gain or loss) of this circumstance can
 6 be estimated by comparing the actual revenue gained from RS 1893 energy sales
 7 with the deemed value of the water/energy removed from the BC Hydro large basin
 8 to serve the additional load rather than being held in storage. The value of the
 9 incremental generation from the large basin that is operated to serve the load can be
 10 expressed as a daily system marginal value.

11 [Table 7](#) below shows the ratepayer benefit (cost) that was calculated for each
 12 system condition during each year of the Pilot.

13 **Table 7 Ratepayer Benefit by System Condition**
 14 **(\$000)**

	Initial Period Jan-Mar 2020	Fiscal 2021	Fiscal 2022	Fiscal 2023	Total
Forced Export	17	1,285	98	49	1,449
Economic Market Import	-	(86)	-	(3)	(89)
Economic Market Export	181	949	1,286	1,031	3,447
Forced Import	(1)	(2)	(1)	(3)	(7)
System Basin	101	391	139	(168)	463
Revenue Gain (Loss)	298	2,538	1,523	906	5,265

15 Note: Numbers may not precisely add due to rounding.

16 The analysis of the value of the incremental RS 1893 load relative to the value of
 17 energy in the BC Hydro system relies on the categorization of system operations into
 18 the five scenarios as outlined. In periods where the system operations are
 19 constrained to minimum or maximum generation, the value of energy is effectively

1 the market price. Outside of these regimes, the value depends on the flexibility of the
2 dispatch of generation from the large reservoirs in the system. The value of this
3 dispatchable energy flexibility has traditionally been calculated based on Mid-C
4 day-ahead forward market prices under the assumption that such prices are
5 representative of electricity trade activity. [Appendix B](#), which is being filed on a
6 confidential basis, provides supporting information on the system marginal values for
7 each year that were used in the calculations of benefits as well as reservoir
8 elevations.

9 As electricity markets have evolved, there is less liquidity in day-ahead markets and
10 more transactions in long term and real time markets. As a result, the metric used in
11 this evaluation report for measuring the value of energy may no longer be as
12 effective and will need to be revisited in future evaluations.

13 **3.1.5 Adjusted Benefit to Non-participants**

14 BC Hydro has further adjusted this initial estimate of non-participant ratepayer
15 benefits to account for direct additional costs which include:

- 16 • Implementation Costs: Incremental costs related to billing, customer and
17 stakeholder engagement, regulatory proceedings (including BCUC fees,
18 Participant Assistance Cost Awards for intervener participation and costs
19 related to BC Hydro retaining external legal services). All other staff and
20 administration costs were funded under existing operating budgets using
21 existing staff. Please refer to section [3.1.5.1](#) for additional detail.
- 22 • Load Shifting Impact: Load shifting occurs when load is moved from one time
23 period to another or from one month to another. In the case of RS 1893, load
24 shifting would occur if, relative to a customer's HLH, LLH and Monthly Demand
25 baselines, there is a shift in load that results in lower consumption on the
26 customer's underlying default rate (RS 1823 – Stepped Rate or RS 1828 –
27 Biomass Energy Program) with corresponding higher consumption on the

1 Incremental Energy Rate (RS 1893). BC Hydro also considers energy that the
 2 customer would have purchased anyway, such as for natural load growth and
 3 use of RS 1893 as a replacement service for RS 1880, in the assessment of
 4 load shifting. Please refer to section [3.1.5.2](#) for more details on the load shifting
 5 analysis and results.

6 Costs related to implementation and load shifting impacts have been used to adjust
 7 BC Hydro's preliminary estimate of ratepayer benefit, as shown in [Table 8](#) below.

8 **Table 8 Adjusted Ratepayer Benefit by Period**
 9 **(\$000)**

Adjusted Ratepayer Benefit	Initial Period Jan-Mar 2020	Year 1 F2021	Year 2 F2022	Year 3 F2023	Totals
Preliminary ratepayer benefit	298	2,538	1,523	906	5,265
Less implementation costs	-	(129)	(5)	(4)	(138)
Less customer-reported load shift impact*	-	-	-	-	-
Less natural load growth impact*	-	(172)	(4)	-	(176)
Less RS 1880 replacement service impact*	-	(166)	-	-	(166)
Adjusted Ratepayer Benefit	298	2,071	1,514	902	4,785

10 * Actuals for Year 1 and Year 2; Year 3 data not available to assess load shifting impacts.

11 For the Pilot, BC Hydro has determined an adjusted ratepayer benefit of
 12 approximately \$4.8 million. Based on this positive outcome, BC Hydro considers that
 13 the Incremental Energy Rate provided a modest net benefit to non-participant
 14 ratepayers. The above analysis does not include other factors that may reduce the
 15 net benefit such as: the impact of customers opting out after consuming incremental
 16 energy during periods of high market prices, and, assuming some of the increased
 17 load would have otherwise been served under RS 1823, the potential impacts on
 18 demand charge revenue and the relative proportion of Tier 1 and Tier 2 energy.

1 **3.1.5.1 Implementation Costs**

2 As of March 2023, BC Hydro incurred approximately \$137,932 incremental costs
 3 specific to the implementation and billing of the Pilot as shown in [Table 9](#) below.
 4 Implementation costs included rate design and regulatory costs (these include half of
 5 the costs relating to BCUC fees, Participant Assistance Cost Awards for intervener
 6 participation and BC Hydro's external legal support associated with the Application),
 7 as well as billing and customer and stakeholder engagement. All other staff and
 8 administration costs were funded under existing operating budgets.

9 **Table 9 Pilot Implementation Costs by**
 10 **Fiscal Year**

Implementation Cost Description	F2020-F2021 (\$)	F2022 (\$)	F2023 (\$)	Totals (\$)
RS 1893 regulatory proceeding	108,832	-	-	108,832
Customer and stakeholder engagement	15,000	-	-	15,000
Billing	5,000	4,900	4,200	14,100
Evaluation report preparation	-	-	-	-
Total	128,832	4,900	4,200	137,932

1 **3.1.5.2 Load Shifting Analysis and Results**

2 As noted in the Application, RS 1823 customers participating in the Pilot remain
3 subject to the terms and conditions of Tariff Supplement No. 74 – Customer
4 Baseline Load (CBL) Determination Guidelines, including Energy CBL resets, for
5 annual RS 1823 energy purchases. While some participating customers might have
6 the capability to shift a portion of their load from RS 1823 to RS 1893, the prospect
7 of an Energy CBL reset under TS 74 significantly mitigates this risk.¹³ BC Hydro
8 notes that no RS 1823 customers participating in the Incremental Energy Rate faced
9 an RS 1823 Energy CBL reset during the Pilot, which suggests that RS 1823
10 consumption was maintained within a reasonable range of participating customer's
11 RS 1823 baselines (i.e., within 90% to 110% of their Energy CBL, after accounting
12 for any applicable adjustments).

13 Further analysis of potential load shifting between RS 1823 and RS 1893 was limited
14 by the following:

- 15 • Since RS 1893 is available all year round for participant customers, it is difficult
16 to ascertain potential impacts of load shifting as participants can buy electricity
17 on the rate year-round (unlike the Freshet Energy rate, where consumption
18 during freshet months can be compared to consumption during non-freshet
19 months to assess load shifting).
- 20 • Due to the COVID-19 pandemic in fiscal 2021 and residual impact in
21 fiscal 2022, overall customer annual consumption under RS 1823 was not
22 comparable to fiscal 2019 which was the year used to determine RS 1893
23 baselines for most participants. There were operational changes across all
24 customer sites as a result of the COVID-19 pandemic. Customers submitted

¹³ This is because an Energy CBL annual reset could result in a material change to the mix of RS 1823 Tier 1 and Tier 2 energy purchases for the Customer's baseline load. All else being equal, this would increase the cost of RS 1823 energy for participant customers who have made prior investments in conservation and operational efficiency. Accordingly, the prospective financial consequence of an Energy CBL reset is a significant deterrent to load shifting.

1 RS 1823 adjustments in relation to these operational changes which were
2 reviewed and accounted for by BC Hydro.¹⁴

- 3 • During the Pilot there was no reported load shifting by customers.

4 Due to the above factors, BC Hydro was not able to estimate any load shifting
5 impacts from customers that resulted in lower consumption on RS 1823 and
6 corresponding higher consumption on RS 1893.

7 As noted above, BC Hydro also considered energy that the customer would have
8 purchased anyway, such as for natural load growth and use of RS 1893 as a
9 replacement service for RS 1880, in the assessment of load shifting:

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

18 For any load shifting that was identified due to natural load growth or use of RS 1893
19 as a replacement for RS 1880, BC Hydro estimated the revenue impact of load
20 shifting as the difference between the actual revenue collected under RS 1893 and
21 the revenue that would have been collected if that volume of energy was purchased
22 under RS 1823 or RS 1880 instead. The results of BC Hydro's assessment of load
23 shifting for the Initial Period, fiscal 2021 and fiscal 2022 are shown in [Table 10](#)

¹⁴ BC Hydro considers analysis of load shifting to be extremely complex as it requires a detailed understanding of the many dynamic factors that impact electrical load at each unique customer site. This can be difficult to identify, separate and verify with certainty during a typical year, let alone an abnormal consumption year such as the case following the COVID-19 pandemic.

1 below. The revenue impact reflects the verified energy consumption impact of each
2 event. Results include:

- 3 • No customer sites with a self-reported load shift;
- 4 • Two customer sites with natural load increase; and
- 5 • One customer site with forced generator outage that used RS 1893 as a
6 replacement service for RS 1880.

7 **Table 10 Load Shifting Results by Assessment**
8 **Category (\$000)**

Load Shifting Category	Initial Period Jan-Mar 2020	Year 1 F2021	Year 2 F2022	Year 3 F2023	Total
Customer-reported load shift	-	-	-	-	-
Natural load increase	-	(172)	(4)	-	(176)
RS 1880 replacement service	-	(166)	-	-	(166)
Total	-	(338)	(4)	-	(342)

9 **3.2 Appropriateness of the Energy Charge Adder**

10 BC Hydro considered various energy charge adders to include in RS 1893.
11 BC Hydro considered a dual objective of ensuring that any prospective new rate was
12 designed to optimize intended rate outcomes, which include:

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

15 Accordingly, BC Hydro has reviewed the RS 1893 energy adder of \$3.00/MWh
16 applicable during the freshet period and \$7.00/MWh applicable during the
17 non-freshet months. Overall, the energy adder was sufficient to mitigate the risk of
18 under-recovering from participant customers and to incorporate a reasonable margin
19 to address uncertainties and make a contribution to fixed costs. It also ensured there

1 was a notional contribution from participants towards the cost of transmission during
2 times of market import.

3 BC Hydro collected \$2.72 million in total energy charge adder rate revenue during
4 the Pilot under RS 1893 (includes rate rider, excludes taxes). BC Hydro considers
5 that the adder has worked as intended. It functions as both a contribution to
6 BC Hydro's fixed costs and as an adder for margin and risk. Customers have
7 however indicated that given the higher-than-normal Mid-C prices in the last two
8 years of the Pilot, that the adder should be scaled back (reduced) to make the rate
9 more competitive.¹⁵

10 **3.3 Customer Understanding and Acceptance**

11 **3.3.1 Customer Load Response**

12 Customer participation in the Incremental Energy Rate Pilot was driven by
13 economics. When Mid-C market prices were favourable, customers took action to
14 increase consumption. Actions taken were operational in nature, using existing plant
15 and equipment. Based on survey responses from participating customers, no
16 participant customers made capital investments or permanent operating changes.

17 Participating customers representing the pulp and paper and electrochemical
18 sectors were highly sensitive to daily market prices, whereas the mining customer
19 participants took a longer-term view. When Mid-C market prices escalated, the rate
20 economics were challenged. In many cases, sustained high Mid-C market prices led
21 to customer requests for service cancellation.

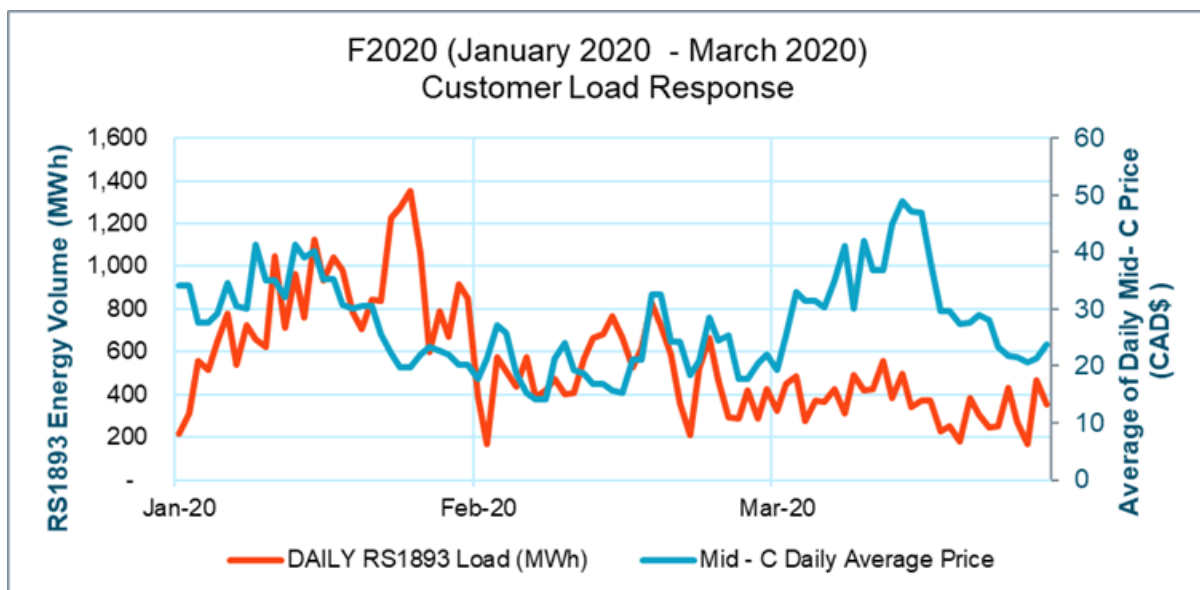
22 During the Pilot, customers generally appeared to operate their facilities to optimize
23 electricity costs such that the aggregate load increase was highest when market
24 energy reference prices were lowest. The rate design works and provides a flexible
25 option for customers to better manage electricity costs. However, during fiscal 2022

¹⁵ Refer to section [3.3.2](#) for a summary of feedback received from participating customers.

1 and fiscal 2023 of the Pilot, the fundamental issue was that Mid-C market prices
2 were very high. This limited the ability of customers to use more electricity through
3 the Pilot. In many cases, high Mid-C market prices led to customer requests for
4 service cancellation.

5 [Figure 5](#) below illustrates the aggregate customer response (load shape) to changes
6 in average daily Mid-C market prices for the Initial Period of the Incremental Energy
7 Rate Pilot. There is a weak positive correlation between the January 2020 customer
8 load response and market energy reference prices (e.g., higher load at lower prices,
9 and vice versa). In contrast, there is no observed correlation between the February
10 2020 customer load response and market energy reference prices.

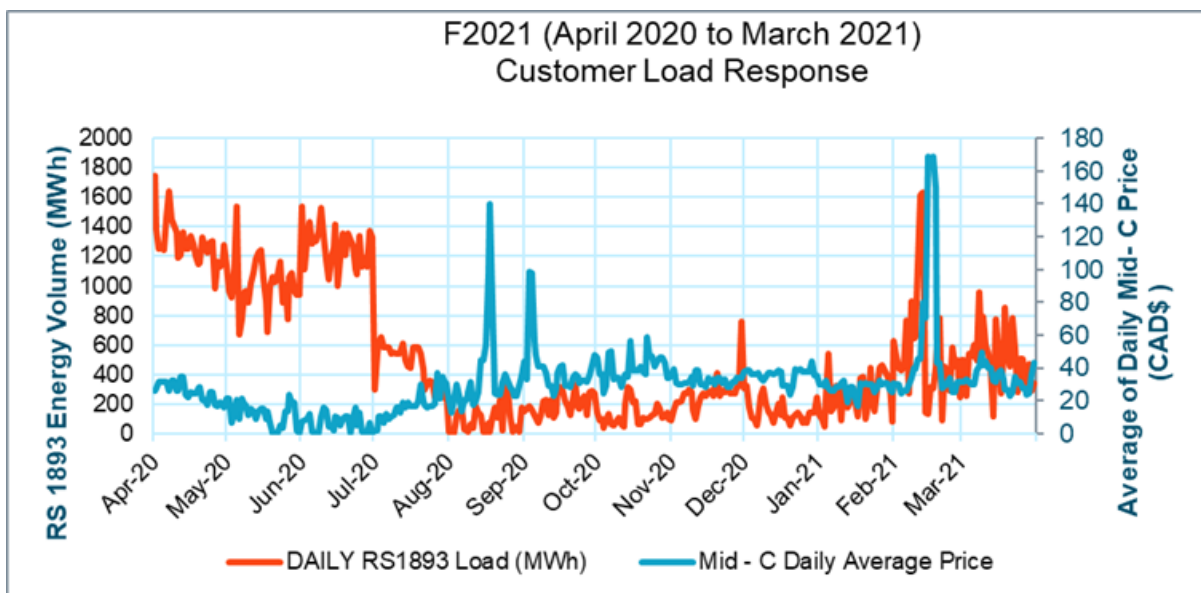
11 **Figure 5 Aggregate Incremental RS 1893 Load,**
12 **Initial Period**



13 [Figure 6](#) below illustrates the aggregate customer response (load shape) to changes
14 in market prices for fiscal 2021. From the participant customer survey responses and
15 participation notices, BC Hydro understands that many customer participants made
16 plans to increase operations during April (based on prior year Mid-C prices) and
17 May to July on the premise (based on their experience from prior years during

1 freshet) that market prices would be low. This premise proved to be accurate.
 2 However, customers were less certain that prices would remain low through the
 3 August to November periods. Accordingly, some customers planned to reduce their
 4 take of incremental energy from August onwards to reduce the risk of a sudden
 5 market energy price spike. In addition, several participant customers opted out of the
 6 rate in September due to high Mid-C prices.

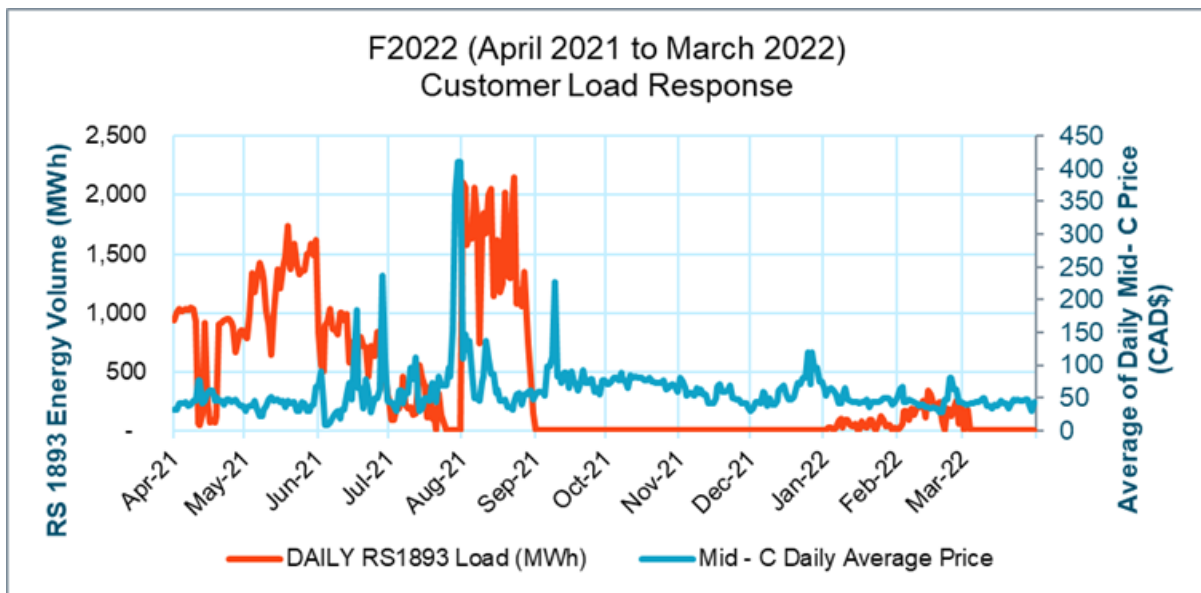
7 **Figure 6 Aggregate Incremental RS 1893 Load,**
 8 **Fiscal 2021**



9 [Figure 7](#) below illustrates the aggregate customer response (load shape) to changes
 10 in market prices in fiscal 2022. From the participant customer survey responses and
 11 participation notices, BC Hydro understands that many customer participants made
 12 plans to increase operations during April and September (based on prior year Mid-C
 13 prices) and May to June on the premise (based on their experience from prior years
 14 during freshet) that market prices would be low. This premise proved to be accurate.
 15 However, customers were less certain that prices would remain low through the
 16 July and August periods. Accordingly, some customers planned to reduce their take
 17 of incremental energy in July onwards to reduce the risk of a sudden market energy

1 price spike. Several participant customers opted out of the rate in July and
2 September due to high Mid-C prices.

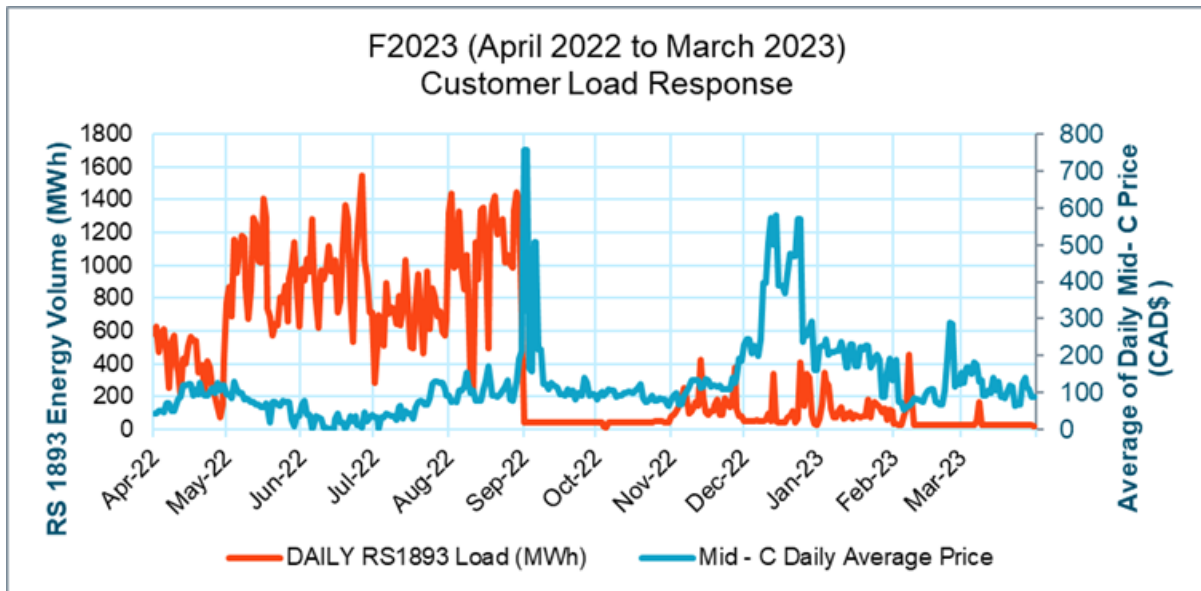
3 **Figure 7 Aggregate Incremental RS 1893 Load,**
4 **Fiscal 2022**



5 [Figure 8](#) below illustrates the aggregate customer response (load shape) to changes
6 in market prices in fiscal 2023. From the participant customer survey responses and
7 participation notices, BC Hydro understands that many customer participants made
8 plans to increase operations during April through August on the premise (based on
9 their experience from prior years) that market prices would be low. This premise
10 proved to be accurate. Several participant customers opted out of the rate in July,
11 August, September and October due to high Mid-C prices.

1
2

Figure 8 Aggregate Incremental RS 1893 Load, Fiscal 2023



3 **3.3.2 Customer Feedback**

4 Participant customers provided feedback to BC Hydro regarding certain aspects of
5 the rate through a survey that was issued at the end of fiscal 2022.¹⁶ Feedback on
6 their experience with the rate is summarized below:

7 “Add provisions for customers with self-generation to address
8 the treatment of major generating plant outages.”

9 “Reduce the energy charge adder to make the rate more
10 competitive.”

11 “The delivery rider should be scaled back to make the rates
12 more competitive. Escalating Mid-C pricing does not make the
13 case any stronger for this rate.”

14 “Apply a ceiling price (such as the Tier 2 rate), consistent with
15 the floor price concept.”

¹⁶ Refer to [Appendix C](#) for a copy of the survey questions.

1 “Provide an on-ramp mechanism to enable a quicker return to
2 the rate if customers were forced to exit/cancel during the year
3 based on extreme market prices.”

4 A representative selection of feedback on participating customer experience is
5 summarized below:

6 “We commend BC Hydro’s efforts to expeditiously develop and
7 introduce the IER pilot as well as communicating the daily
8 pricing information concisely and in a timely fashion. We
9 strongly believe that the Incremental Energy Rate Pilot has been
10 a win-win-win program for (participant) customers, BC Hydro
11 and rate-payers. The rate provides additional revenues as
12 opportunity sales to BC Hydro which offset costs and provides
13 system-wide benefits, and it allows participating customers
14 greater control over managing their costs. We support and
15 advocate that the IER pilot be made permanent going forward.”

16 “The rate pilot was extremely beneficial. We delivered what we
17 expected, we increased energy purchases when it was
18 favourable, and reduced our fuel costs. Unfortunately, there is
19 no provision for a major authorized planned outage of our
20 generating equipment which forced us to opt out of the program.
21 We also had difficulties operating to our baseline during winter
22 conditions due to the loss of a power boiler that reduced our
23 ability to increase generation. We became more at risk to higher
24 Mid-C pricing.”

25 “We were happy with the performance of our operations to
26 respond to the Mid-C price signals. The volatility of the Mid-C
27 price is our biggest challenge to try and determine a monthly
28 focus on what we want to achieve.”

29 Collectively, BC Hydro considers that the results and customer feedback provided
30 indicate support for the rate among participating customers.

1 **3.4 Practicality of Administration**

2 BC Hydro considers that the baseline determination, adjustment and billing process
3 was both well-understood and well-supported by customers. Specifically, customers
4 provided feedback that the process was clear and the baselines were fair. The rate
5 did, however, necessarily introduce additional administrative work as outlined below.

6 **3.4.1 Customer Communication and Baseline Determination, Adjustment 7 and Approval**

8 For each period of the Pilot and in accordance with Special Condition 3 of RS 1893,
9 customers provided written notice to BC Hydro to take electricity under RS 1893 via
10 an application form submitted by March 1st of the previous year. Following receipt of
11 the application form, BC Hydro prepared RS 1893 Baseline Statements for each
12 participating customer which included 12 HLH Baselines, 12 LLH Baselines and
13 12 Monthly Reference Demand Baselines determined in accordance with Special
14 Condition 7 of RS 1893. The purpose of the customer specific electricity baselines is
15 to separate incremental RS 1893 electricity purchases from RS 1823 or RS 1828
16 electricity purchases during a subsequent billing period.

17 BC Hydro emailed the RS 1893 Baseline Statements to each participating customer
18 and requested that the customer review the information to confirm that it was
19 accurate (i.e., matched their invoices) and representative of expected RS 1823 or
20 RS 1828 electricity usage during subsequent billing periods. BC Hydro asked each
21 participating customer to sign the RS 1893 Baseline Statement as confirmation of
22 this review. BC Hydro staff made themselves available by email, telephone,
23 in-person (pre-COVID) and virtual meetings to review the RS 1893 Baseline
24 Statement with participant customers, to discuss prospective actions and estimated
25 take-up volumes, and to consider energy baseline and Monthly Reference Demand
26 adjustments. Special Condition 8 of RS 1893 provides BC Hydro and the customer
27 with the ability to determine alternative baselines or Monthly Reference Demand
28 baselines, subject to BCUC approval, where the parties consider that fiscal 2019

1 data is not representative of expected RS 1823 usage during the RS 1893 Initial
2 Period, fiscal 2021, fiscal 2022 and fiscal 2023.

3 BC Hydro has filed a number of adjusted electricity baselines pursuant to Special
4 Condition 8 as described below:

- 5 • In the Initial Period (January to March 2020), nine participant customer sites
6 had baselines determined in accordance with RS 1893 using unadjusted
7 fiscal 2019 data. Four participant sites had baselines that required adjustment
8 pursuant to Special Condition 8 of RS 1893. These were filed with and
9 approved by the BCUC.¹⁷ The purpose of the customer-specific electricity
10 baselines is to separate incremental RS 1893 electricity purchases from
11 RS 1823 electricity purchases during the Initial 2020 Incremental Energy Rate
12 Period.
- 13 • In fiscal 2021, there were seventeen participant customer sites. Four of the
14 participants previously had their baselines adjusted during the Initial Period and
15 the remaining thirteen had baselines determined using unadjusted fiscal 2019
16 data.
- 17 • In fiscal 2022, there were nine participant customer sites that had baselines
18 determined in accordance with RS 1893 using unadjusted fiscal 2019 data.
19 Six participant sites had baselines that required adjustment pursuant to Special
20 Condition 8 of RS 1893. These were filed with and approved by the BCUC.¹⁸
- 21 • In fiscal 2023, there were 12 participant customer sites that had baselines
22 determined in accordance with RS 1893 using unadjusted fiscal 2019 data or
23 previously adjusted baselines. One participant site had baselines that required
24 adjustment. These were filed with and approved by the BCUC.¹⁹

¹⁷ Refer to BCUC Order No. G-74-20.

¹⁸ Refer to BCUC Order No. G-171-21.

¹⁹ Refer to BCUC Order No. G-149-22.

1 In each instance the details of the specific adjustment were filed with the BCUC on a
2 confidential basis to protect commercially sensitive customer information.

3 **3.4.2 Billing Process**

4 RS 1893 energy billing has a monthly billing settlement, customers considered this
5 process as being practical and efficient as no after-the-fact reconciliation is required.

6 **3.4.3 Interruption**

7 BC Hydro did not curtail RS 1893 service to any customer during the Pilot. Sufficient
8 energy and capacity were always available to serve the incremental load.

9 **3.5 Interactions and Possible Synergies with Other Non-Firm** 10 **Rates**

11 **3.5.1 Interactions with RS 1880 – Standby and Maintenance Supply**

12 In discussions with BC Hydro, customers with site self generation have indicated
13 that there were short durations of generator curtailment for minor repairs, during
14 these periods auxiliary boilers would be used to support process requirements but
15 generators would remain shutdown to reduce gas consumption. Typically, customers
16 request for RS 1880 service for longer than 16 hours of non-voluntary curtailment
17 periods, the administrative details and the timing of an outage within a billing period
18 also determine if a customer calls for service under RS 1880. Customers with
19 contracted generation have an obligation under the EPA to make sure they meet the
20 obligation, and any events of non-voluntary curtailment would be reported to
21 BC Hydro for an adjustment. BC Hydro is not aware of any such curtailments during
22 the periods these customers were taking service under RS 1893 during the Pilot.²⁰

- 23 • In the Initial Period, of the 13 customer participants, BC Hydro has determined
24 that a total of six customers with self-generation facilities took service under

²⁰ In some circumstances RS 1880 service was requested by the participants with self-generation after opting out of the Incremental Energy Rate for each of the periods of the rate.

1 RS 1893. None of these customer sites used RS 1893 as a substitute for
2 RS 1880.

- 3 • In fiscal 2021, of the 17 customer participants, BC Hydro has determined that a
4 total of seven customers with self-generation facilities took service under
5 RS 1893. Of these, only one customer site was verified to have used RS 1893
6 as a substitute for RS 1880. This was due to an extended event of generator
7 curtailment. BC Hydro considers that the customer would have normally
8 requested RS 1880 service during the period of generator curtailment, but for
9 the availability of RS 1893. Events of voluntary self-generation curtailment
10 reflect a direct customer action to increase load under RS 1893 (e.g., the
11 desired outcome) as opposed to an event of generator outage that BC Hydro
12 considers would have occurred anyway.
- 13 • In fiscal 2022, of the 15 customer participants, BC Hydro has determined that a
14 total of five customers with self-generation facilities took service under
15 RS 1893. None of these customers used RS 1893 as a substitute for RS 1880
16 (for the period they participated in the rate).
- 17 • In fiscal 2023, of the 13 customer participants, BC Hydro has determined that a
18 total of five customers with self-generation facilities took service under
19 RS 1893. None of these customers used RS 1893 as a substitute for RS 1880
20 (for the period they participated in the rate).

21 **3.5.2 Comparison of RS 1893 and RS 1892 Usage During Freshet Period**

22 BC Hydro anticipated that the number of future RS 1892 customer participants
23 would be approximately 50% lower than the number of historical RS 1892
24 participants due to forestry sector plant shutdowns and certain customers electing to
25 take RS 1893 service rather than RS 1892 service.²¹ The tables below provide a
26 summary of the number of participants under RS 1892 (Freshet Energy) and

²¹ BCUC IR 1.7.1 No. 1 – Transmission Service Market Reference-Priced Rates Application.

1 RS 1893 (Incremental Energy Rate) and the gross energy and revenue for each
 2 fiscal year during the freshet period. The results are indicative of the customer
 3 support of the Incremental Energy Rate Pilot and the expected uptake. BC Hydro
 4 expected that some customers would prefer the seasonal Freshet Rate, while others
 5 would prefer the annual Incremental Energy Rate Pilot. This expectation is reflected
 6 in the RS 1893 customer participation during the Initial Period, fiscal 2021,
 7 fiscal 2022 and fiscal 2023. Having both rates available provided transmission
 8 service customers with choice during the Pilot.

9 **Table 11 Fiscal 2021 – RS 1893 and RS 1892**
 10 **Comparison**

	RS 1893	RS 1892	Total
	F2021 (May-July)	F2021 (May-July)	
Number of Participant Sites	17	25	42
HLH - Net Energy (MWh)	46,888	43,070	89,958
LLH - Net Energy (MWh)	36,702	30,148	66,850
Total RS 1893/RS 1892 energy sales (MWh)	83,591	73,218	156,809
Average unit cost of market priced energy (\$/MWh)	11.60	13.72	-
HLH Energy - Revenue (\$ million)	0.78	0.81	1.59
LLH Energy - Revenue (\$ million)	0.19	0.19	0.38
RS 1893/RS 1892 energy revenue (\$ million)	0.97	1.00	1.97
Plus \$3/MWh adder rate energy volume (\$ million)	0.25	0.22	0.47
Total RS 1893/RS 1892 gross revenue (\$ million)	1.22	1.22	2.44

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**Table 12 Fiscal 2022 – RS 1893 and RS 1892
Comparison**

	RS 1893	RS 1892	Total
	F2022 (May-July)	F2022 (May-July)	
Number of Participant Sites	15	14	29
HLH - Net Energy (MWh)	35,261	13,447	48,708
LLH - Net Energy (MWh)	32,084	8,305	40,389
Total RS1893/RS 1892 energy sales (MWh)	67,345	21,752	89,097
Average unit cost of market priced energy (\$/MWh)	46.18	71.20	-
HLH Energy - Revenue (\$ million)	1.97	1.23	3.19
LLH Energy - Revenue (\$ million)	1.14	0.32	1.47
RS 1893/RS 1892 energy revenue (\$ million)	3.11	1.55	4.66
Plus \$3/MWh adder rate energy volume (\$ million)	0.20	0.07	0.27
Total RS 1893/RS 1892 gross revenue (\$ million)	3.31	1.61	4.93

4

5

**Table 13 Fiscal 2023 – RS 1893 and RS 1892
Comparison**

	RS 1893	RS 1892	Total
	F2023 (May-July)	F2023 (May-July)	
Number of Participant Sites	13	16	29
HLH - Net Energy (MWh)	41,684	30,372	72,056
LLH - Net Energy (MWh)	37,755	21,000	58,755
Total RS1893/RS 1892 energy sales (MWh)	79,439	51,372	130,811
Average unit cost of market priced energy (\$/MWh)	55.18	58.03	-
HLH Energy - Revenue (\$ million)	2.99	2.17	5.15
LLH Energy - Revenue (\$ million)	1.40	0.81	2.21
RS 1893/RS 1892 energy revenue (\$ million)	4.38	2.98	7.36
Plus \$3/MWh adder rate energy volume (\$ million)	0.24	0.15	0.39
Total RS 1893/RS 1892 gross revenue (\$ million)	4.62	3.14	7.76

1 Compared to Years 1, 2 and 3 of the Freshet Pilot, there was an overall total slight
 2 reduction in the number of participants and the energy purchased under RS 1892
 3 and RS 1893 during the fiscal 2021 to fiscal 2023 freshet periods. Due to the
 4 COVID-19 pandemic in fiscal 2021, overall customer participation and energy sales
 5 was reduced. The COVID-19 pandemic impact continued into fiscal 2022.

6 **3.5.3 Impact of Offering Multiple Non-firm Rates**

7 [Table 14](#) below compares the freshet rate pilot periods of 2016, 2017 and 2018 with
 8 the RS 1892 and RS 1893 freshet periods of 2021, 2022 and 2023.

9 **Table 14 Comparison of Freshet Periods of**
 10 **2016 to 2018 and 2021 to 2023**

	RS 1892	RS 1892 / RS 1893
	2016 – 2018 (May-July)	2021 – 2023 (May-July)
Total RS 1893/RS 1892 energy sales (MWh)	457,847	376,717
RS 1893/RS 1892 energy revenue (\$ million)	9.83	14.00
Plus \$3/MWh adder rate energy volume (\$ million)	1.37	1.13
Total RS 1893/RS 1892 gross revenue (\$ million)	11.77	15.13

11 As indicated in [Table 14](#), total revenue to BC Hydro increased in the May to July
 12 periods of fiscal 2021, 2022 and 2023 with both rates offered, relative to the May to
 13 July periods of fiscal 2016, 2017 and 2018 when only RS 1892 (Freshet Energy)
 14 was offered. However, the increased revenue was attributable to higher market
 15 prices since overall energy volumes decreased.

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Appendix A

RS 1893 Energy Pricing

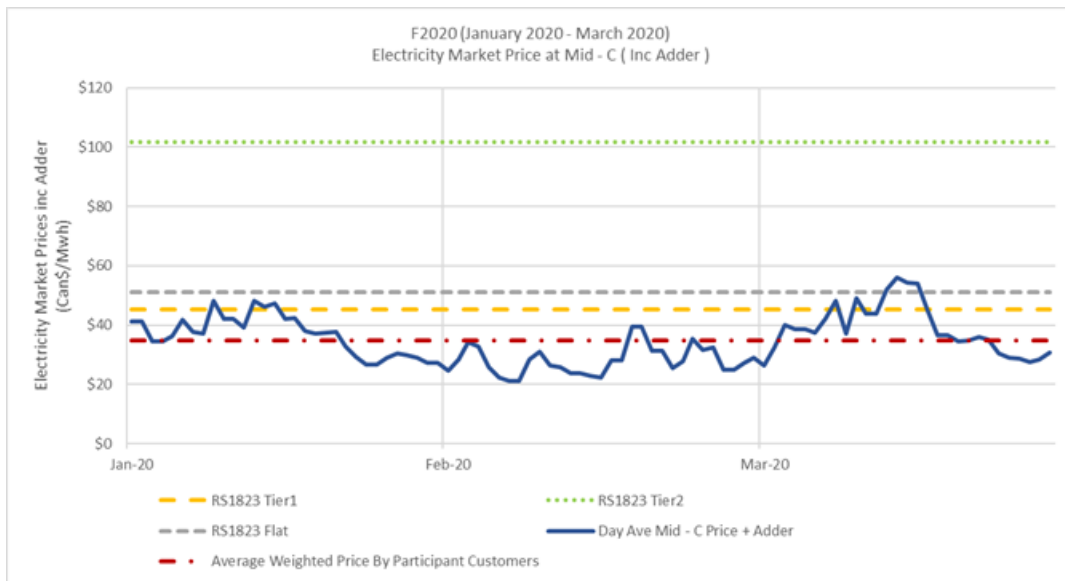
RS 1893 Energy Pricing

The average weighted market price paid for RS 1893 energy by participant customers, plus a \$3.00/MWh or \$7.00/MWh adder charge as applicable and (2)% rate rider for fiscal 2023, is shown in the sub-sections below. The Mid-C prices were significantly higher in fiscal 2022 and fiscal 2023 compared to the Initial Period (January to March 2020) and fiscal 2021.

Initial Period – January to March 2020

[Figure A-1](#) below shows the RS 1823 Tier 1, Tier 2 and RS 1823A energy prices compared to the average weighted daily RS 1893 energy price in HLH and LLH (including the \$7/MWh adder) paid by participant customers during the Initial Period of January to March 2020.

Figure A-1 RS 1893 Energy Price Including Adder, Fiscal 2020



1 For the Initial Period, the average daily price for RS 1893 energy in HLH and LLH
2 was usually below the otherwise applicable price(s) for RS 1823 energy. In
3 summary:

- 4 • There were no negative priced HLH or LLH days;
- 5 • There were four days when the net daily LLH market price (including \$7/MWh
6 adder) was higher than the RS 1823 Tier 1 energy price of \$45.35/MWh; and
- 7 • There were 16 days when the net daily HLH market price (including \$7/MWh
8 adder) was higher than the RS 1823 Tier 1 energy price of \$45.35/MWh.

9 As shown in [Table A-1](#) below, the total average weighted price paid for RS 1893
10 energy by participant customers was \$34.92 CAD/MWh²² (including \$7.00/MWh
11 adder charge). This compares to the RS 1823 Tier 1 energy price of \$45.35/MWh,
12 the RS 1823 Tier 2 energy price of \$101.60/MWh and the RS 1823 Energy Charge
13 A of \$50.98/MWh (all prices excluding taxes). For the Initial Period, the energy price
14 differential between the average RS 1893 energy price and the RS 1823 Tier 1
15 energy price was \$10.43/MWh.

16 **Table A-1 RS 1823 and RS 1893 Energy Prices**
17 **(January to Mar 2020)**

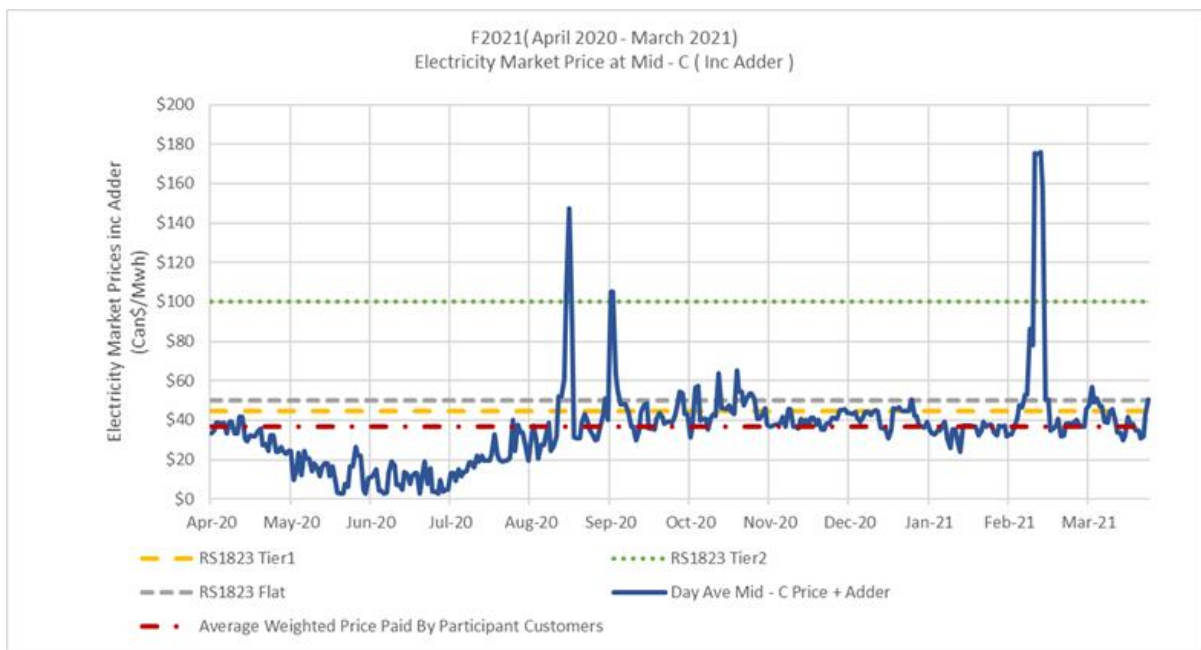
Energy Prices by Rate Schedule	Initial Period Jan-Mar 2020 (\$CAD/MWh)
Average RS 1893 Energy Price (includes adder)	34.92
RS 1823 Tier 1 energy price	45.35
RS 1823 Tier 2 energy price	101.60
RS 1823 Energy Charge Part A price	50.98
Energy price differential vs RS1823 Tier 1	10.43

²² The actual price of RS 1893 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Incremental Energy Rate Energy.

1 **Fiscal 2021**

2 [Figure A-2](#) below shows the RS 1823 Tier 1, Tier 2 and RS 1823 Energy Charge A
3 energy prices compared to the average weighted daily RS 1893 energy price in HLH
4 and LLH (including \$3/MWh adder for May to July and \$7/MWh adder for all other
5 months) paid by participant customers during fiscal 2021.

6 **Figure A-2 RS 1893 Energy Price Including Adder,**
7 **Fiscal 2021**



8 For fiscal 2021, the average daily price for RS 1893 energy in HLH and LLH was
9 usually below the otherwise applicable price(s) for RS 1823 energy. In summary,
10 during fiscal 2021:

- 11 • There were 25 days where the market price of LLH energy was negative such
12 that the energy charge floor price of \$0/MWh under RS 1893 was applied. The
13 negative prices were during the freshet period i.e., May to July 2020;

- 1 • There were two days where the market price of HLH was negative such that the
2 energy charge floor price of \$0/MWh under RS 1893 was applied. The negative
3 days were in May;
- 4 • There were 37 days when the net daily LLH market price (including \$3/MWh
5 adder or \$7/MWh adder as applicable) was higher than the RS 1823 Tier 1
6 energy price of \$44.62/MWh; and
- 7 • There were 95 days when the net daily HLH market price (including \$3/MWh
8 adder or \$7/MWh adder as applicable) was higher than the RS 1823 Tier 1
9 energy price of 44.62/MWh.

10 As shown in [Table A-2](#) below, the total average weighted price paid for RS 1893
11 energy by participant customers was \$36.96 CAD/MWh²³ (includes \$3.00/MWh
12 adder for May – July and \$7.00/MWh adder for the rest of the months, excludes
13 taxes). This compares to the RS 1823 Tier 1 energy price of \$44.62/MWh, the
14 RS 1823 Tier 2 energy price of \$99.95/MWh and the RS 1823 Energy Charge A
15 of \$50.15/MWh (all prices excluding taxes). For fiscal 2021, the energy price
16 differential between the average RS 1893 energy price and the RS 1823 Tier 1
17 energy price was \$7.66/MWh.

18 **Table A-2 RS 1823 and RS 1893 Energy Prices**
19 **F2021**

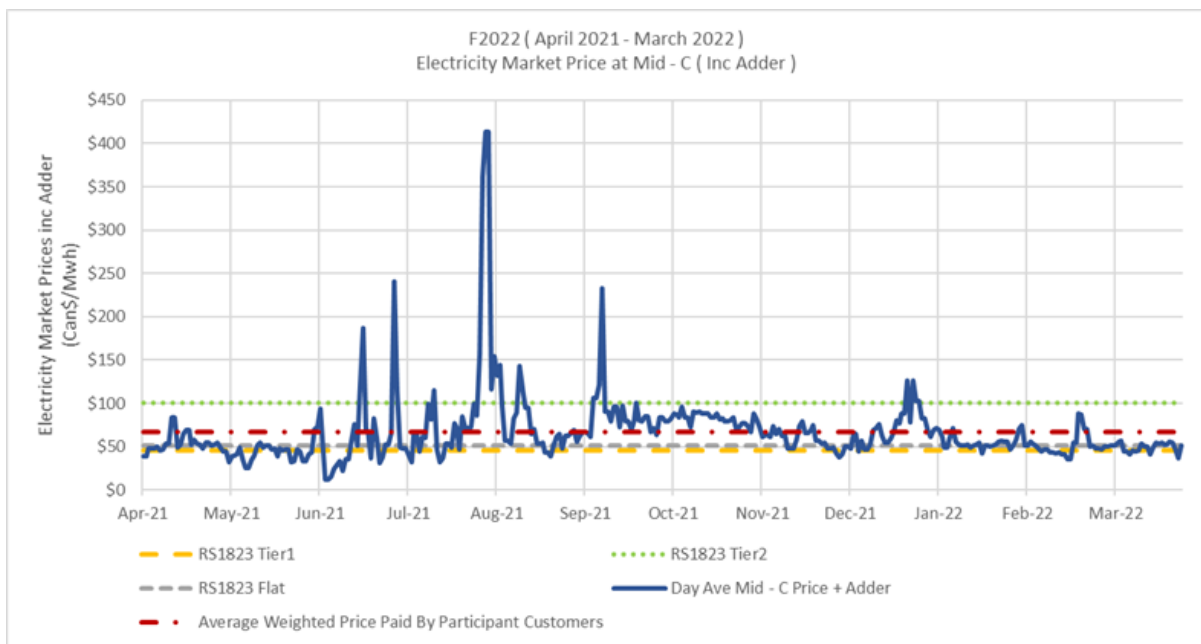
Energy Prices by Rate Schedule	F2021 (\$CAD/MWh)
Average RS1893 Energy Price (includes adder)	36.96
RS 1823 Tier 1 energy price	44.62
RS 1823 Tier 2 energy price	99.95
RS 1823 Energy Charge Part A price	50.15
Energy price differential vs RS1823 Tier 1	7.66

²³ The actual price of RS 1893 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Incremental Energy Rate Energy.

1 **Fiscal 2022**

2 [Figure A-3](#) below shows the RS 1823 Tier 1, Tier 2 and RS 1823 Energy Charge A
3 energy prices compared to the average weighted daily RS 1893 energy price in HLH
4 and LLH (including \$3/MWh adder for May – July and \$7/MWh adder for all other
5 months) paid by participant customers during fiscal 2022.

6 **Figure A-3 RS 1893 Energy Price Including Adder,**
7 **Fiscal 2022**



8 For fiscal 2022, the average daily price for RS 1893 energy in HLH and LLH was
9 higher than the otherwise applicable price(s) for RS 1823 energy. In summary:

- 10 • There were no negative priced LLH and HLH days;
- 11 • There were 266 days when the net daily LLH market price (including \$3/MWh
12 or \$7/MWh adder as applicable) was higher than the RS 1823 Tier 1 energy
13 price of \$45.07/MWh;

- 1 • There were 267 days when the net daily HLH market price (including \$3/MWh
2 or \$7/MWh adder as applicable) was higher than the RS 1823 Tier 1 energy
3 price of 45.07/MWh; and
- 4 • There were three days when the when the net daily HLH market price (including
5 \$3/MWh or \$7/MWh adder as applicable) was higher the \$600/MWh such that it
6 was not economical to purchase incremental energy.

7 As shown in Table A-3 below, the total average weighted price paid for RS 1893
8 energy by participant customers was \$67.41 CAD/MWh²⁴ (includes \$3.00/MWh
9 adder for May to July and \$7.00/MWh adder for the rest of the months, excludes
10 taxes). This compares to the RS 1823 Tier 1 energy price of \$45.07/MWh, the
11 RS 1823 Tier 2 energy price of \$100.95/MWh and the RS 1823 Energy Charge A
12 of \$50.65/MWh (all prices excluding taxes). For fiscal 2022, the energy price
13 differential between the average RS 1893 energy and the RS 1823 Tier 1 energy
14 price was \$(22.34)/MWh.

15 **Table A-3 RS 1823 and RS 1893 Energy Prices**
16 **F2022**

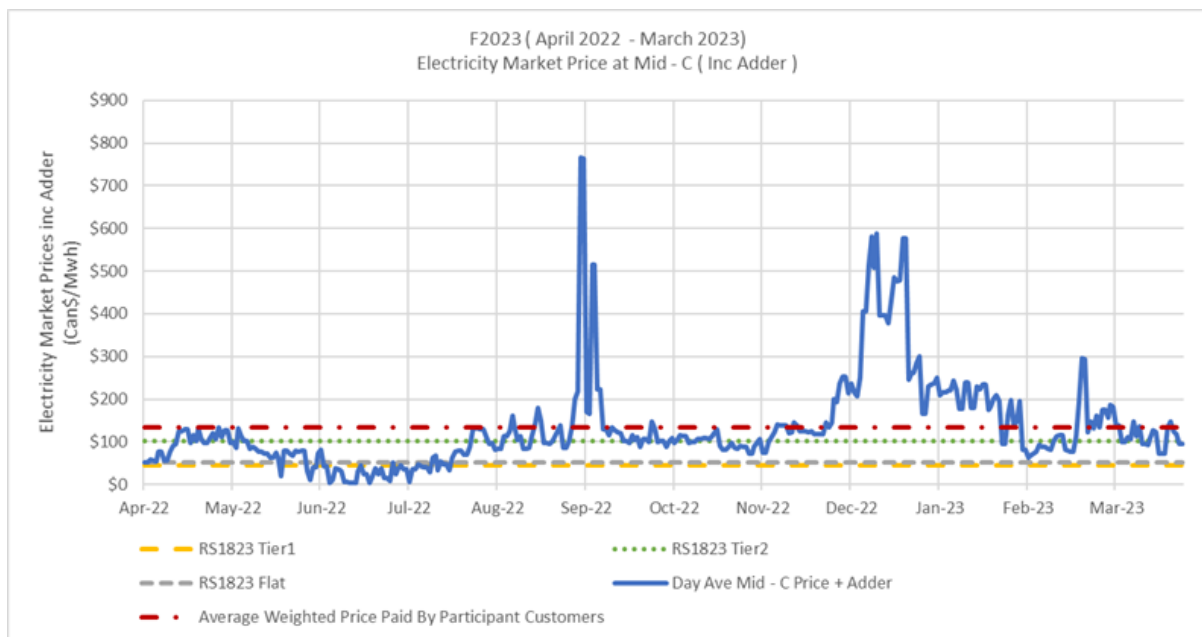
Energy Prices by Rate Schedule	F2022 (\$CAD/MWh)
Average RS1893 Energy Price (includes adder charge)	67.41
RS 1823 Tier 1 energy price	45.07
RS 1823 Tier 2 energy price	100.95
RS 1823 Energy Charge Part A price	50.65
Energy price differential vs RS1823 Tier 1	(22.34)

²⁴ The actual price of RS 1893 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Incremental Energy Rate Energy.

Fiscal 2023

Figure A-4 below shows the RS 1823 Tier 1, Tier 2 and RS 1823 Energy Charge A energy prices compared to the average weighted daily RS 1893 energy price in HLH and LLH (including \$3/MWh adder for May to July and \$7/MWh adder for all other months) paid by participant customers during fiscal 2023.

Figure A-4 RS 1893 Energy Price Including Adder, Fiscal 2023



For fiscal 2023, the average daily price for RS 1893 energy in HLH and LLH was higher than the otherwise applicable price(s) for RS 1823 energy. In summary:

- There was no negative priced LLH and HLH days in F2022;
- There were 313 days when the net daily LLH market price (including \$3/MWh or \$7/MWh adder as applicable) was higher than the RS 1823 Tier 1 energy price of \$45.35/MWh;

- 1 • There were 294 days when the net daily HLH market price (including \$3/MWh
2 or \$7/MWh adder as applicable) was higher than the RS 1823 Tier 1 energy
3 price of 45.07/MWh; and
- 4 • There were six days when the when the net daily HLH market price (including
5 \$3/MWh or \$7/MWh adder as applicable) was higher the \$600/MWh such that it
6 was not economical to purchase incremental energy.

7 As shown in [Table A-4](#) below, the total average weighted price paid for RS 1893
8 energy by participant customers was \$134.81CAD/MWh²⁵ (includes \$3.00/MWh
9 Adder charge for May – July and \$7.00/MWh Adder charge for the rest of the
10 months, excludes taxes). This compares to the RS 1823 Tier 1 energy price
11 of \$45.35/MWh, the RS 1823 Tier 2 energy price of \$101.58/MWh and the RS 1823
12 Energy Charge A of \$50.96/MWh (all prices excluding taxes). For fiscal 2022, the
13 energy price differential between the average RS 1893 energy and the RS 1823
14 Tier 1 energy price was \$(89.46) MWh.

15 **Table A-4 RS 1823 and RS 1893 Energy Prices**
16 **F2023**

Energy Prices by Rate Schedule	F2023 April 2022 - March 2023 (\$CAD/MWh)
Average RS1893 Energy Price (includes adder charge)	134.81
RS 1823 Tier 1 energy price	45.35
RS 1823 Tier 2 energy price	101.58
RS 1823 Energy Charge Part A price	50.96
Energy price differential vs RS1823 Tier 1	(89.46)

17 Generally, in fiscal 2023, the Mid-C prices were significantly higher than prior years
18 with two days prices being over \$1,200/MWh.

²⁵ The actual price of RS 1893 energy paid by each specific customer was higher or lower than this weighted average to reflect their unique daily mix of HLH and LLH Net Incremental Energy Rate Energy.

1 During the Pilot, participating RS 1893 customers had advance knowledge of
2 day-ahead market prices for both HLH and LLH and could choose to use energy
3 under RS 1893 when day-ahead market prices were economic relative to RS 1823
4 energy prices. Customers also realized RS 1823 demand savings in any Billing
5 Period where actual metered demand in HLH was higher than their Monthly
6 Reference Demand. Accordingly, it is BC Hydro's view that the Incremental Energy
7 Rate provided customers with a lower cost option for incremental electricity use for
8 the Initial Period and fiscal 2021. In fiscal 2022 and fiscal 2023, the average daily
9 prices for RS 1893 energy in HLH and LLH were much higher than the Initial period
10 and fiscal 2021.

**BC Hydro Transmission Service Market Reference
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Evaluation Report on Rate Schedule 1893

Appendix B

Supporting Information on System Marginal Values

PUBLIC

Supporting Information on System Marginal Values

For each period of the Pilot, a daily system marginal value was determined for each of BC Hydro’s Kinbasket and Williston reservoirs in HLH and LLH. BC Hydro’s system marginal values during each period of the Pilot are shown in [Table B-1](#) below.

Table B-1 System Marginal Values (CAD/MWh)²⁶

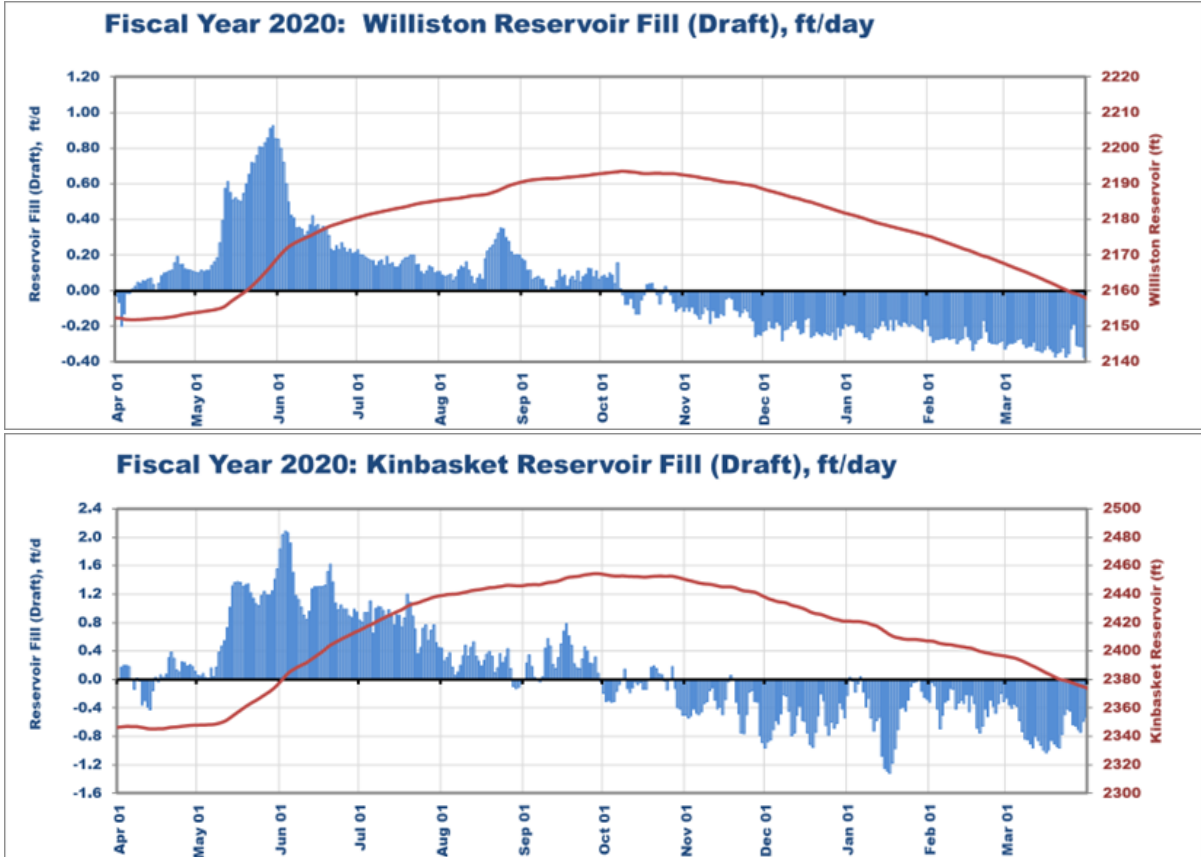
System Marginal Values (CAD/MWh)	Kinbasket	Williston
Initial Period (Jan-March 2020)	██████	██████
F2021	██████	██████
F2022	██████	██████
F2023	██████	██████

[Figure B-1](#) to [Figure B-4](#) below provide the Williston and Kinbasket reservoir fill rates and levels for each period of the Pilot.

²⁶ When a basin marginal value is zero, it means that the reservoir is run at maximum possible (first preference).

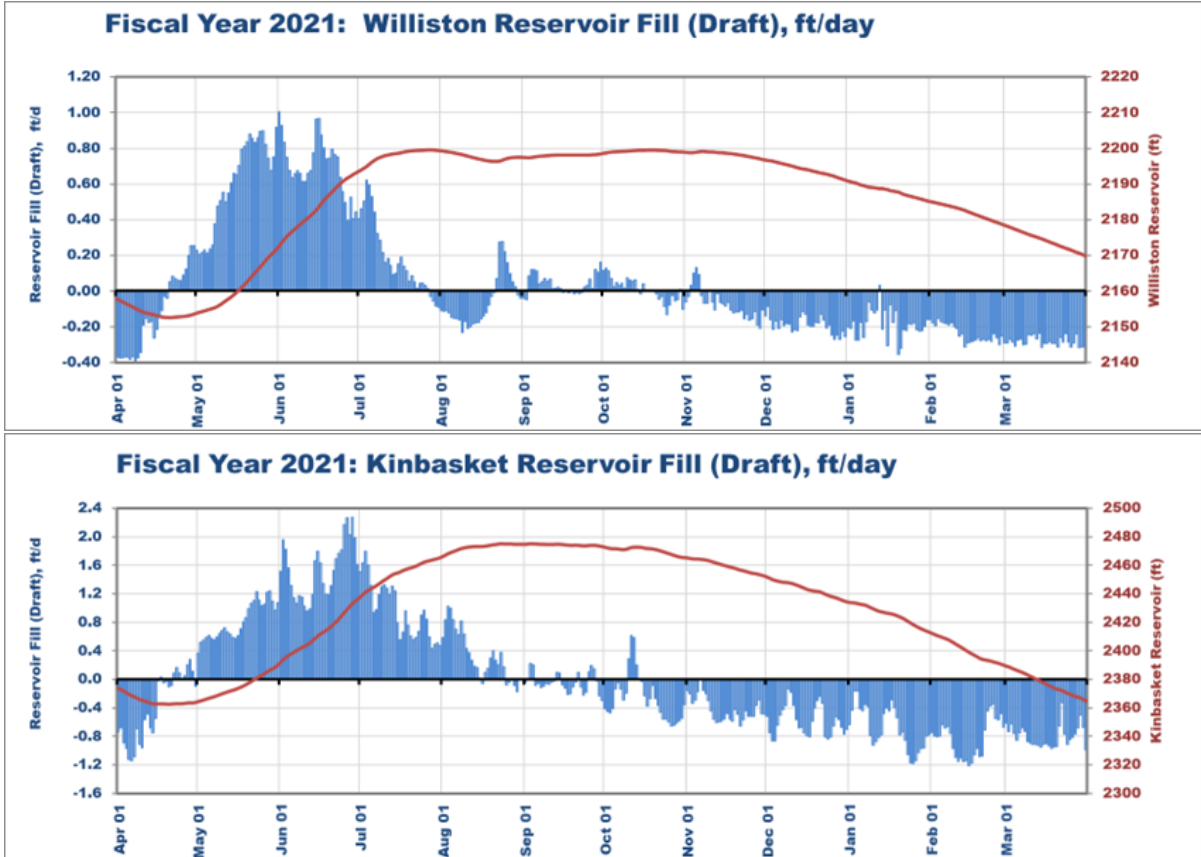
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Figure B-1 Williston and Kinbasket Reservoir Fill Rates and Levels for Fiscal 2020



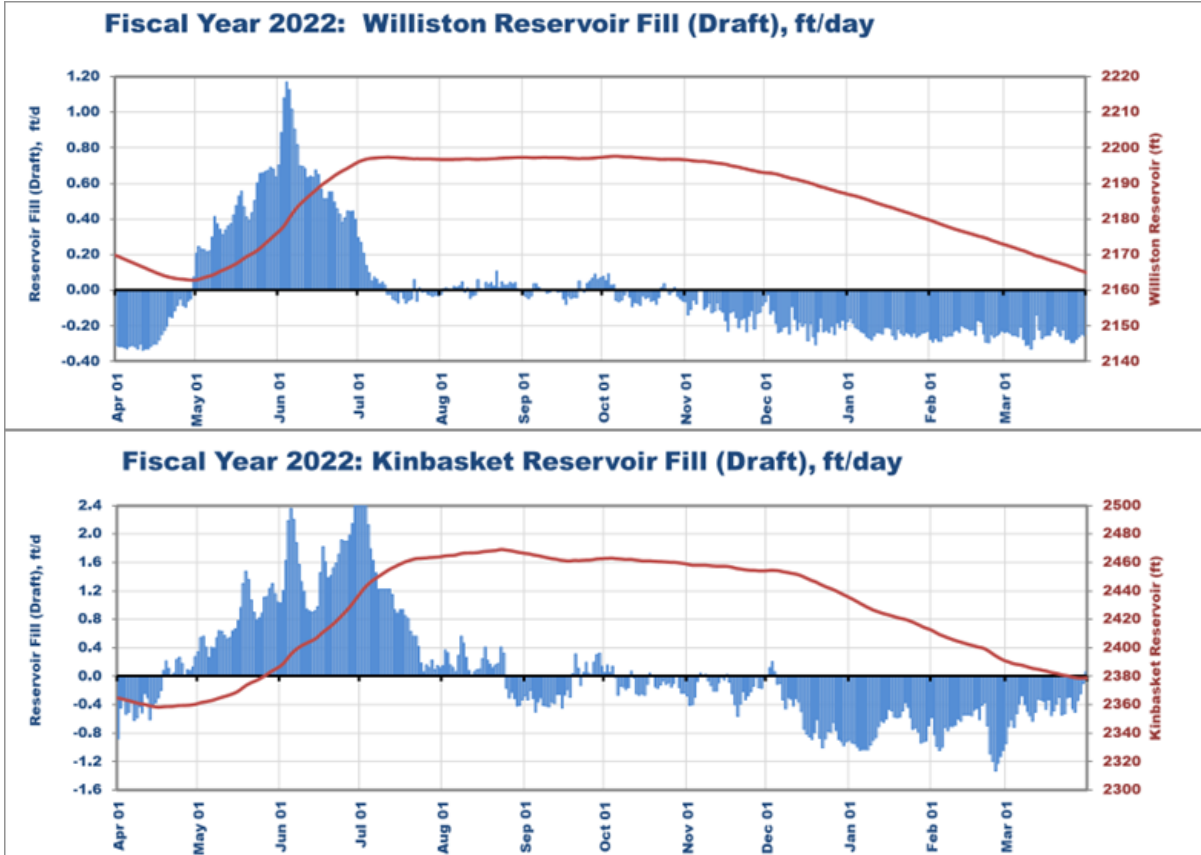
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Figure B-2 Williston and Kinbasket Reservoir Fill Rates and Levels for Fiscal 2021



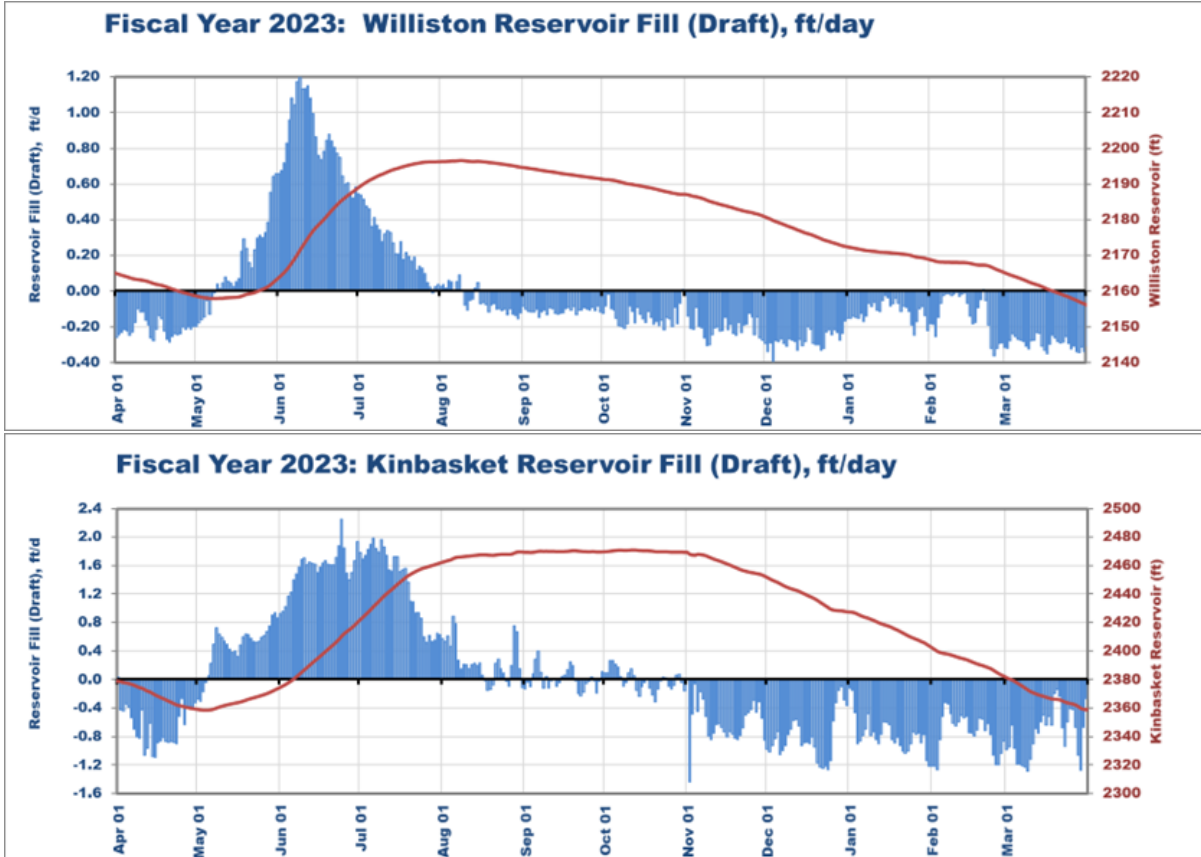
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Figure B-3 Williston and Kinbasket Reservoir Fill Rates and Levels for Fiscal 2022



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Figure B-4 Williston and Kinbasket Reservoir Fill Rates and Levels for Fiscal 2023



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Evaluation Report on Rate Schedule 1893

Appendix C

**RS 1893 Incremental Energy Rate Survey
January 1, 2020 to March 31, 2022**

SURVEY QUESTIONS – RS 1893 INCREMENTAL ENERGY RATE 1ST JANUARY 2020 – 31ST MARCH 2022		
SECTION 1: CONTACT INFORMATION		
Company		
Facility Name		
Customer Name		
Customer Title		
Signature		
SECTION 2: ACTIONS TAKEN		
1. Please identify the period your facility participated in the Incremental Energy rate Pilot (RS 1893)? (check all that apply)		
<input type="checkbox"/> 1 st January 2020 – 31 st March 2020	<input type="checkbox"/> 1 st April 2020 – 31 st March 2021	<input type="checkbox"/> 1 st April 2021 – 31 st March 2022
2. Per your participation application notice, you described actions your facility would take to achieve your estimated load increase. Please tell us about your experience.		
a) What specific action did you take? Please list actions and provide additional details. (Choose from the list below and describe the action(s) you took)		
<input type="checkbox"/> Utilize idle incremental capacity/increase runtime/uptime <input type="checkbox"/> Restart Existing Equipment <input type="checkbox"/> Restart Production Line(s) <input type="checkbox"/> Add new equipment <input type="checkbox"/> Fuel Switch from alternate fuel to Electric <input type="checkbox"/> Turn-down Self Generation <input type="checkbox"/> Add Production shift(s) <input type="checkbox"/> Make more Energy Intensive Product(s) <input type="checkbox"/> Capital investment in new plant <input type="checkbox"/> Shift maintenance shutdown event(s) <input type="checkbox"/> Other		
b) Did you leave anything on the table?		
<input type="checkbox"/> Yes - please explain:		

<input type="checkbox"/> No	
3. How did you communicate details of the Rate to your operational staff? Please explain	
4. How did you use the day-ahead market pricing information provided by BC Hydro to shape your actions?	
5. Was there a price threshold above which it was not economic for you to increase load?	
6. Did you focus on differentials between HLH or LLH periods or was the focus more on certain days, certain months or the entire IER Period?	
7. Did you make any investments in equipment, technology, or resources to take advantage of the Rate?	
8. Did you use RS 1893 as a replacement service (substitute) for RS 1880?	
SECTION 3: RESULTS ACHIEVED	
9. What specific results did you achieve? Consider operational, financial, production, resourcing impacts a) Did you increase production? b) Did you increase sales?	
<input type="checkbox"/> Yes - please explain: <input type="checkbox"/> No	

<p>10. What was the overall value to your business? a) Did you set specific targets? b) Did you achieve them?</p>	
<p><input type="checkbox"/> Yes - please explain:</p> <p><input type="checkbox"/> No</p>	
<p>11. How did you track/measure your performance? What tools, metrics, feedback loops etc. did you use to assess how you were tracking against your target objectives?</p>	
<p>SECTION 4: IN REVIEW / NEXT STEPS</p>	
<p>12. What are your over-arching views on your Incremental Energy Rate experience for the period 1st January 2020 – 31st March, 2022? Was it beneficial? Why or why not?</p>	
<p>13. If you plan on participating in the Incremental Energy Rate in F2022 starting 1st April, 2022, is there anything that you would seek to do differently / do better this time round?</p>	
<p>14. Do you have any suggestions for BC Hydro on how any aspect of the rate could be improved based on the first 27 months of the pilot (1st January 2020 – 31st March, 2022)?</p>	
<p>15. Have you made any capital investments and or permanent operating changes to use incremental electricity under the IER? If yes, what changes have you made?</p>	
<p><input type="checkbox"/> Yes - please explain:</p> <p><input type="checkbox"/> No</p>	
<p>Thank you for your feedback.</p> <p>Customer feedback for each year of the pilot will be consolidated into one Evaluation Report and filed with the Commission on or by 15th September, 2023.¹</p>	

¹ Commission Order Number G-256-20