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October 24, 2019

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

Dear Mr. Wruck:

**RE: Project No. 1599004
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Application to Amend Net Metering Service under Rate Schedule (RS) 1289
(Application)
Responses to BCUC and Interveners Information Request No.2**

BC Hydro writes in compliance with Commission Order No. G-217-19A to provide its responses to Commission and Interveners Information Request No. 2 as follows:

Exhibit B-7	Responses to Commission IRs (Public Version)
Exhibit B-8	Responses to Interveners IRs (Public Version)
Exhibit B-8-1	Responses to Interveners IRs (Confidential Version)

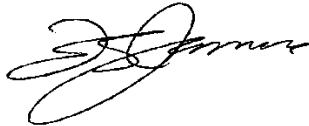
BC Hydro is filing the response to SJOMAN 2.2.1 confidentially with the Commission. BC Hydro confirms that an explanation for the request for confidential treatment is provided in the public version of the IR response. BC Hydro seeks this confidential treatment pursuant to section 42 of the *Administrative Tribunals Act* and Part 4 of the Commission's Rules of Practice and Procedure.

BC Hydro notes that it has declined to answer questions related to the terms and conditions of Standing Offer Program ("SOP") agreements, and questions related to the program volumes related to the SOP, as these questions are outside of the scope of the Application.

October 24, 2019
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Responses to BCUC and Interveners Information Request No.2

For further information, please contact Chris Sandve at 604-974-4641 or by email at bhydroregulatorygroup@bhydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

cs/tl

Enclosure

BC Community Solar Coalition Information Request No. 2.10.1 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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**10.0 Reference: Stakeholder Consultation and Communication
 Exhibit B-5, BCCSC IR 1.1.3
 Staff resources**

BC Hydro stated in response to BCCSC IR 1.1.3 that “BC Hydro did not track the staff time to conduct customer and stakeholder engagement... All staff time was accommodated within existing budgets and staffing levels” and, “The program is managed by 3.0 FTE’s in the Power Acquisitions and Contract Management Key Business Unit (KBU”.

2.10.1 Please provide a rough estimate of the time staff spent on customer and stakeholder engagement.

RESPONSE:

BC Hydro staff involved in the Program spend much of their time communicating with individual customers on a variety of issues in addition to conducting formal stakeholder engagement activities.

Accordingly, and given that staff time on customer and stakeholder engagement for the Application was not tracked, BC Hydro is not able to provide a meaningful estimate of the time spent on customer and stakeholder engagement.

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**10.0 Reference: Stakeholder Consultation and Communication
Exhibit B-5, BCCSC IR 1.1.3
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2.10.2 Please describe the duties and responsibilities of the 3.0 FTE staff in the KBU that are not related to regulatory issues?

RESPONSE:

The 3.0 FTEs are responsible for administering the Program including processing simple and complex applications, information management, coordinating with other areas of BC Hydro, providing Program updates, communicating with customers to explain the Program, and addressing customer concerns.

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**10.0 Reference: Stakeholder Consultation and Communication
Exhibit B-5, BCCSC IR 1.1.14
Stakeholder Engagement**

BCCSC is concerned about BC Hydro’s stakeholder engagement and its potential bias noting that a table titled “Evolution of Net Metering Program” (Appendix D pg. 5) was incomplete and excluded Order No. G-7-15. BC Hydro responded “stakeholder engagement materials were focused on specific proposed changes.” BC Hydro further stated that “BC Hydro will consider matters related to the leasing opportunities for future applications”.

2.10.3 BC Hydro recognizes that Order G-07-15 allows customers to lease clean or renewable generators. Is BC Hydro of the view that “considering matters related to leasing” means that Order G-07-15 is out of scope of the application and stakeholder engagement?

RESPONSE:

BC Hydro is not proposing any amendments related to leasing in the Application. Accordingly, BC Hydro’s view is that matters related to leasing are outside the scope of the Application.

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**10.0 Reference: Stakeholder Consultation and Communication
 Exhibit B-5, BCCSC IR 1.1.14
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BCCSC is concerned about BC Hydro’s stakeholder engagement and its potential bias noting that a table titled “Evolution of Net Metering Program” (Appendix D pg. 5) was incomplete and excluded Order No. G-7-15. BC Hydro responded “stakeholder engagement materials were focused on specific proposed changes.” BC Hydro further stated that “BC Hydro will consider matters related to the leasing opportunities for future applications”.

2.10.4 How did BC Hydro inform stakeholder that the engagement materials were not to be taken as representative of the RS 1289 in its entirety? Did BC Hydro take any steps to alert stakeholders that the table “Evolution of Net Metering Program” was an edited or abridged version of the history and evolution of the RS 1289, not to be taken as the development of the rate over time?

RESPONSE:

BC Hydro provides an overview of the history of Rate Schedule 1289 in section 1.4 of the Application. This section includes a discussion of BCUC Order No. G-7-15.

During the webinars, BC Hydro informed participants of the focus of the upcoming Application. This is shown on page 11 of Appendix D of the Application.

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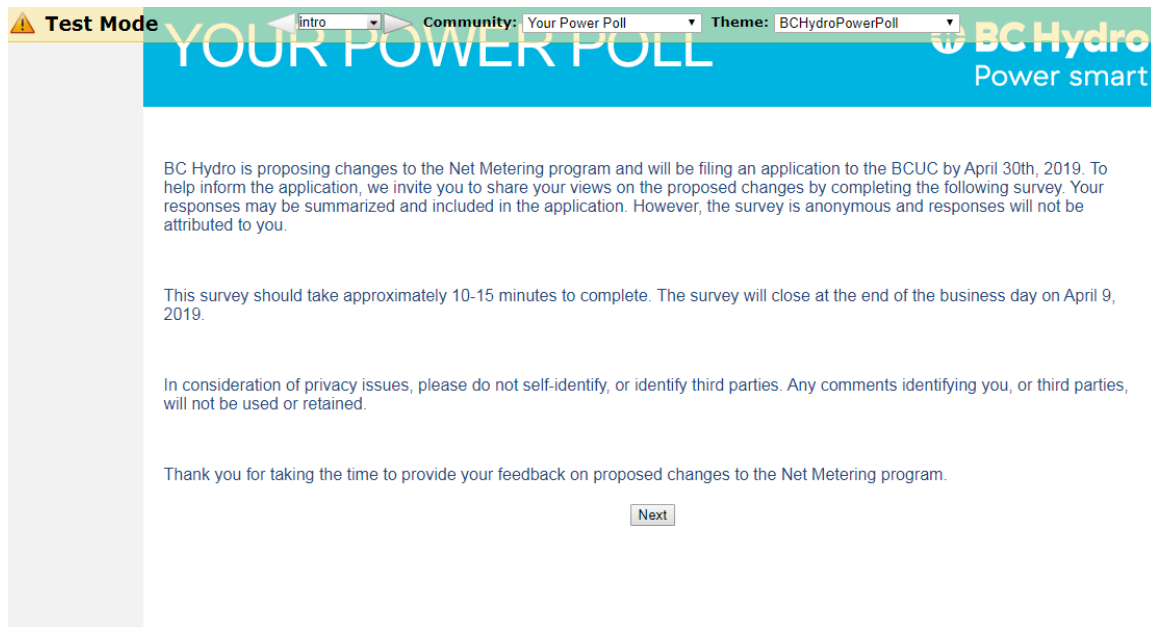
**10.0 Reference: Stakeholder Consultation and Communication
 Exhibit B-5, BCCSC IR 1.1.15
 Survey**

BCCSC asked for BC Hydro to provide the web version of the survey as provided to participants. BC Hydro provided a text version of the survey, not the final web version which was the version participants were provided.


2.10.5 Please provide the graphical web version of the survey. Screen captures, or the like, would suffice.

RESPONSE:

Screenshots of the survey are provided below. The screenshots were taken in test mode so that the dataset would not be contaminated.



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Mode q5 Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL

Did you participate in a Net Metering webinar?
 Please select one response only.

Yes
 No

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ode q1 Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL


We need to know a little about who you are so we can better understand your responses. Which of the following best describes your interest in Net Metering?
 (If you fit more than one category, you may select multiple options)

Please select all that apply.

a net metering applicant (I have applied but I'm not on the net metering billing yet)
 a net metering customer (my system is operating and I'm on the net metering billing)
 an installer/contractor for net metering customers
 other - please specify

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q2
Community: Your Power Poll
Theme: BCHydroPowerPoll


YOUR POWER POLL

If you are an existing customer, what type of customer are you?
 Please select one response only.

- residential
- commercial
- municipal government
- First Nations
- community group
- school
- other - please specify


q3
Community: Your Power Poll
Theme: BCHydroPowerPoll


YOUR POWER POLL

Please indicate which of the following statements is most applicable to you.
 Please select one response only.

- Over time, I expect to generate less energy than I consume.
- Over time, I expect to generate about as much energy as I consume.
- Over time, I expect to generate more energy than I consume.
- Not applicable - not a customer


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ode q4 Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL

What generation technologies do you use or are planning to install?
 Please select all that apply.

- solar PV
- hydroelectric
- wind
- other - please specify

de q6 Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL


Addressing Oversized Generation

In April 2018, BC Hydro made interim changes to require new applicants to size their proposed generation so that it is no greater than their electricity consumption. While this change prevents new customers from installing oversized generation, it also created some unintended consequences. For example, under the current rules, a customer who plans to purchase an electric vehicle may not be able to offset their future additional load. To accommodate these customers while maintaining the Net Metering program as a load offset program, BC Hydro is considering changes to this approach.

Of the options below, which one would you prefer?
 Please select one response only.

- Continue the interim solution and allow flexibility (e.g. allow generation up to 10% higher than anticipated load)
- No load-to-generation ratio (dependent on other program changes)
- Other suggestions

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de q7 Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL

Options for Payment Terms


Under the current net metering tariff, any excess energy credits remaining after a customer's anniversary date (the anniversary of BC Hydro's authorization to connect) are paid out every 12 months (known as the true-up period).

BC Hydro is considering different options relating to the setting of the anniversary date in order to maximize the use of credits to offset their consumption.

Which option would you prefer?
 Please select one response only.

- Set a common anniversary date for all customers (e.g. March 1st for everyone)
- Allow customers to choose their anniversary date (i.e. individual preference)

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de q7b Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL


BC Hydro is considering extending the true-up period or allowing customers to bank their credits. This would provide customers with increased opportunities to use their credits to offset their consumption.

Which option would you prefer?
 Please select one response only.

- Continue the current 12-month true-up period
- Extend the true-up period from the current 12-months to 24-months or longer

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Community: Your Power Poll Theme: BCHydroPowerPoll
 


YOUR POWER POLL

BC Hydro is considering changes to the price customers receive for excess generation so that the price paid would reflect the price that BC Hydro could sell the electricity for on the regional wholesale market. This reflects the principle of the Net Metering program as a load offset program for customers wishing to offset their consumption and reduce their electricity bills.

Which option would you prefer?
 Please select one response only.

- Allow customers to bank their credits for 5 years (credits expire after 5 years)
- Revise the price for excess energy to reflect the price at which BC Hydro could sell the electricity on the regional wholesale market


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Community: Your Power Poll Theme: BCHydroPowerPoll
 

YOUR POWER POLL

Grandfathering of Existing Customers


BC Hydro is considering a grandfathering provision for existing net metering customers. Please indicate your support for the following proposal:
 Please click on your selection or drag the slider to your selection.

	Strongly oppose	Oppose	Somewhat support	Support	Strongly support
Grandfather existing customers for a period up to 5 years and commit to review the grandfathering provision after the selected term expires.					

Do you have any additional comments or suggestions about grandfathering for existing customers?


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id Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL

Are there other comments you would like to provide on the proposed changes to the Net Metering program?

id Community: Your Power Poll Theme: BCHydroPowerPoll 

YOUR POWER POLL

Thank you for providing feedback on the Net Metering program.
You may now close the survey.

BC Community Solar Coalition Information Request No. 2.10.6 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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10.0 Reference: Stakeholder consultation. BCCSC IR 1.1.2.1, 1.1.13, 1.1.1.14

2.10.6 How can First Nations' solar ventures, community solar, heat pumps, EVs, Community Net Metering all be excluded *a priori* from a webinar and questionnaire on NM that deals with rate design, oversized generation and alleged cost-shifting?

RESPONSE:

Participants in the webinar and Engagement Survey were provided with the opportunity to raise other matters related to the Program. A summary of these responses are included in Appendix E of the Application. BC Hydro will consider these matters in future applications.

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10.0 Reference: Stakeholder consultation. BCCSC IR 1.1.2.1, 1.1.13, 1.1.1.14

2.10.7 BC Hydro claims that this is amendment about rate, timing, and injury to non-participants. Yet, they put into the amendment something on safety and compulsory application, but do not want to address topics like community NM, non-emitting generation, reservoirs as ideal storage, distributed generation, climate crisis, etc. Please describe in detail why BC Hydro chose to exclude such essential considerations from the webinar, survey and in the responses to interveners, but chose to focus on safety, etc?

RESPONSE:

BC Hydro limited the scope of the Application to allow for engagement with stakeholders and customers on the topics in the Application while meeting the requirement to file the Application by April 30, 2019.

The miscellaneous tariff changes outlined in section 5 of the Application have been under consideration for some time, as discussed in the Evaluation Report provided as Appendix F of the Application.

BC Community Solar Coalition Information Request No. 2.10.8 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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10.0 Reference: Stakeholder consultation (BCCSC 1.1.13)

BC Hydro claims that changes are required to maintain the program as a load offset program and to limit cost shifting...

2.10.8 Did BC Hydro ever consider that both hypothesis (load offset and cost shifting) are based on skewed and incomplete information and are incorrect? Did BC Hydro consider other parameters?

RESPONSE:

BC Hydro believes that the proposed amendments to Rate Schedule 1289 are required and are supported by the evidence provided in the Application and in response to information requests.

BC Community Solar Coalition Information Request No. 2.10.9 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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10.0 Reference: Stakeholder consultation (BCCSC 1.1.15.1)

BCCSC are concerned about using a survey that did not give participants the option to review their answers before submitting. BC Hydro responded to BCCSC IR 1.1.15.1 that it is 'not common practice to give participants the option to review...'

2.10.9 Please provide references showing that such 'review possibility' is not common practice in designing a proper review.

RESPONSE:

As this approach is common practice amongst researchers, a specific reference is not available. However, BC Hydro canvassed its main external research partners who confirmed that they also follow this practice.

The key reasons for this practice are as follows:

- **Surveys are typically structured so that answering a given question will not impact subsequent questions. This eliminates order bias. If respondents are given the opportunity to change answers, then order bias becomes an issue in the results.**
- **If respondents are provided an opportunity to review their responses, some would not notice or would choose not to change their answers at the end of a survey. This would impact the results because there will be a set of responses where answers were changed and a set of responses where answers were not changed.**
- **Market research does not require "correct" information in the way that, for example, a tax filing does. Changing a survey response does not make the results more "correct", but may reflect other influences after the fact, which then biases the original response.**

Please also refer to BC Hydro's responses to BCCSC IR 2.10.5 and BCUC IR 2.32.3 where we clarify that respondents had an opportunity to submit additional feedback in a comment box following the questions in the survey.

BC Community Solar Coalition Information Request No. 2.11.1 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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**11.0 Reference: Virtual Net Metering
Exhibit B-5, BCCSC IR 1.2.2
Virtual Net Metering definition**

BCCSC noted that BC Hydro uses an original and novel definition of Virtual Net Metering in the Glossary of Terms and Abbreviations (Appendix H page v of the Application). BC Hydro replied that the definition “refers to how this term has been used in the Application. BC Hydro further states in response to CEC IR 1.22.1 “we are not able to provide any details on definitions”. BCCSC notes that the BC Hydro definition is incorrect stating: “Virtual Net Metering: [a] system that allows bill crediting across multiple customers for a shared net metering project by allocating credits to each subscriber’s electric bill for excess energy produced by their share of the project.” This definitions is generally accurate but for the word excess.

2.11.1 Is BC Hydro willing to use the industry standard definitions of Virtual Net Metering, Community Net Metering, and Aggregate Net Metering in future applications and evaluation reports? If not, please state why not?

RESPONSE:

BC Hydro will evaluate at the time of any future applications (if any) what the appropriate definitions should be given the context of the application.

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**12.0 Reference: Resource planning
 Exhibit B-5, BCCSC IR 1.3.1-1.3.15**

BC Hydro responded by making four statements about solar, pertaining to seasonal profile, peak demand, intermittency and cost of solar.

2.12.1 Did BC Hydro consider that the first three are non-issues in the lucky situation existing in BC that abundant hydro-reservoirs provide ample storage?

RESPONSE:

The seasonal profile of solar generation, the coordination of BC Hydro’s system peak demand vs. solar peak generation and the intermittency of solar generation are all important considerations when determining the role and fit of solar energy in long term planning.

Long term planning involves determining the appropriate mix of resources, such as supply, demand or other grid assets, in order to optimize the system as a whole.

While BC Hydro has significant storage hydro resources, generation that is seasonal, intermittent or not aligned with BC Hydro’s system peak demand can limit BC Hydro’s overall system flexibility, creating additional costs for ratepayers.

BC Community Solar Coalition Information Request No. 2.12.2 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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**12.0 Reference: Resource planning
 Exhibit B-5, BCCSC IR 1.3.1-1.3.15**

BC Hydro responded by making four statements about solar, pertaining to seasonal profile, peak demand, intermittency and cost of solar.

2.12.2 Is BC Hydro not aware of many recent studies – including in Canada - on the cost solar that completely contradict their statement on the high cost of solar?

RESPONSE:

In BC Hydro’s response to BCCSC IR 1.3.6, we state that the costs of solar at the utility scale in British Columbia are estimated to be higher than other renewable energy sources, such as wind.

In other words, the cost of utility scale solar in British Columbia is high relative to the cost of other renewable energy sources, such as wind. BC Hydro is not aware of any recent studies that would indicate that the cost of utility scale solar in British Columbia is lower than equivalent wind resources in British Columbia.

Solar costs have been declining and BC Hydro will be examining costs and trends of energy and capacity resources in British Columbia, including solar, as part of the upcoming Resource Options Inventory that will be completed in 2020 to inform BC Hydro’s 2021 Integrated Resource Plan.

BC Community Solar Coalition Information Request No. 2.12.3 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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**12.0 Reference: Resource planning
 Exhibit B-5, BCCSC IR 1.3.1-1.3.15**

Sorry to have to repeat the question, but this is just one of many questions that BC Hydro failed to answer:

2.12.3 Has BC Hydro considered the need for increased solar production given projected increasing demand for electricity in the future?

RESPONSE:

Yes, BC Hydro has considered how new energy resources may be required given the projected long term demand for electricity in the future. This includes solar as well as other new clean energy resources such as wind, renewal of existing contracts with Independent Power Producers, Demand Side Management resources or expansion of existing heritage assets.

Through the Resource Options Inventory, BC Hydro maintains an up-to-date view of the potential and relative costs and benefits of these options. The Resource Options Inventory will be updated in 2020 to inform the 2021 Integrated Resource Plan which will determine the need for new energy resources in light of long term trends. BC Hydro plans to file the 2021 Integrated Resource Plan with the BCUC in February 2021.

BC Community Solar Coalition Information Request No. 2.12.4 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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**12.0 Reference: Resource planning
 Exhibit B-5, BCCSC IR 1.3.1-1.3.15**

Eight years and six years is a long time in research on climate crisis and precipitation. When asked for an explanation on why BC Hydro’s projections on precipitation patterns in BC differ from the scientific consensus, they reference a study published in 2011 and an internal report from 2013.

2.12.4 Please submit some more recent studies showing relevant data and projection for BC and the Northwest Pacific region and discuss how they concur or differ from BC Hydro’s working models.

RESPONSE:

BC Hydro builds our understanding of future climate change and ways to adapt our business to increase resilience by reviewing new relevant climate change research as it becomes available and by participating in workshops and industry working groups on climate change science and adaptation.

BC Hydro is using the projections produced by the Pacific Climate Impacts Consortium (“PCIC”) and Environment and Climate Change Canada, which are consistent with scientific consensus for this region. While the 2011 study results are generally consistent with more recent climate modelling, early assessments indicate that the trend is accelerating faster than the 2011 projections.

BC Hydro continues to partner with PCIC to update the 2011 climate and hydrological projections for British Columbia with the Coupled Model Intercomparison Project Phase 5 (“CMIP5”) global climate models. This work has taken PCIC five years to complete and the full results are expected to be available in October 2019. All of PCIC's updated projections are available on their Climate Explorer tool at www.pacificclimate.org. BC Hydro is in the process of reviewing these new results and will start to incorporate them into our planning in the coming year.

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**13.0 Reference: Exhibit B-5, CEC 1.18.2
 Exhibit B-3, BCUC 1.3.3**

2.13.1 Please revise the table provided in the response to CEC 1.18.2 to include the number of net metering customers associated with the system upgrades paid for by BC Hydro in each year.

RESPONSE:

The table below includes the number of upgrades related to net metering connections for the past five fiscal years.

	F2015	F2016	F2017	F2018	F2019	Total
Cost (\$)	0	11,000*	11,000	0	6,000	28,000
Number of customers	0	4	2	0	2	8

* A portion of the costs associated with one customer in fiscal 2016 was paid in fiscal 2017.

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**13.0 Reference: Exhibit B-5, CEC 1.18.2
 Exhibit B-3, BCUC 1.3.3**

2.13.2 How many of the customers that were connected in F2016 and F2017 (per CEC 1.18.2) and for which BC Hydro has incurred system upgrade costs are also customers from whom BC Hydro purchased surplus energy in F2019 (per BCUC 1.3.3)?

RESPONSE:

The table below identifies the number of customers:

- For which BC Hydro incurred system upgrade costs; and
- Who received a Surplus Energy Payment in fiscal 2019.

	F2016	F2017
Cost (\$)	11,000	11,000
Number of customers for which BC Hydro incurred system upgrade costs	4	2
Number of customers with Surplus Energy Payment in fiscal 2019	3	1

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**13.0 Reference: Exhibit B-5, CEC 1.18.2
Exhibit B-3, BCUC 1.3.3**

2.13.3 Would the net metering customers who were connected in F2019 be eligible for surplus energy payments in F2019?

RESPONSE:

No. Surplus Energy Payments are paid to customers on their Anniversary Date which is 12 months after their connection date. Therefore, customers who joined the Program in fiscal 2019 would have their Surplus Energy Payment assessed in fiscal 2020.

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**13.0 Reference: Exhibit B-5, CEC 1.18.2
Exhibit B-3, BCUC 1.3.3**

2.13.3 Would the net metering customers who were connected in F2019 be eligible for surplus energy payments in F2019?

2.13.3.1 If yes, how many of the customers connected in F2019 (per CEC 1.18.2) and for which BC Hydro has incurred system upgrade costs are also customers from whom BC Hydro purchased surplus energy in F2019 (per BCUC 1.3.3)

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.13.3.

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14.0 Reference: Exhibit B-3, BCUC 1.7.1

2.14.1 Would the requirement “to generate electricity to serve all or part of their Electricity requirements on the Customer’s Premises” be (re)assessed if a net metering customer applied to have their service/service connection modified?

RESPONSE:

If the Generating Facility previously authorized to connect does not change, BC Hydro will not re-assess the customer’s Annual Load. BC Hydro believes that physical changes to the electrical service (such as an upgrade from a 200A service to a 400A service) are unlikely to result in a reduction in load.

BC Hydro notes that the current Distributed Generation Technical Interconnection Requirements (DGTIR) require that customers “... notify BC Hydro of any subsequent changes to equipment, by submitting a revised Interconnection Application form, to confirm that the proposed equipment modification still meets the requirements...”.

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14.0 Reference: Exhibit B-3, BCUC 1.7.1

2.14.1 Would the requirement “to generate electricity to serve all or part of their Electricity requirements on the Customer’s Premises” be (re)assessed if a net metering customer applied to have their service/service connection modified?

2.14.1.1 14.1.1 If not, why not?

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.14.1.

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15.0 Reference: Exhibit B-3, BCUC 1.7.3

2.15.1 For any BC Hydro's DSM program that requires an application from the customer, does BC Hydro assess whether the customer has behind-the-meter generation and whether the implementation of the DSM measure would result in generation exceeding the customer's load?

RESPONSE:

No. While many of BC Hydro's residential and commercial DSM programs require an application from the customer, BC Hydro does not currently assess whether the customer has behind-the-meter generation.

BC Hydro strives to make the DSM application process as efficient as possible because of the large number of participants and the transaction costs involved with reviewing applications. Assessing whether the customer has behind-the-meter generation and the impact of the implementation of the DSM measure would add additional time and costs into the application review. This could be considered in DSM program applications going forward, but any potential benefit would have to be weighed against the additional costs required.

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15.0 Reference: Exhibit B-3, BCUC 1.7.3

2.15.1 For any BC Hydro's DSM program that requires an application from the customer, does BC Hydro assess whether the customer has behind-the-meter generation and whether the implementation of the DSM measure would result in generation exceeding the customer's load?

2.15.1.1 If not, why not?

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.15.1.

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**16.0 Reference: Exhibit B-5, BCSEA 1.15.3.2
 Exhibit B-5, CEC 1.10.3**

2.16.1 If “generally, the capacity factors in the tariff underestimate the actual Annual Energy Output of a customer’s Generating Facility”, why hasn’t BC Hydro undertaken to update/refine the capacity factors used to establish the Annual Energy Output?

RESPONSE:

In BC Hydro’s view, the current capacity factors are suitable for the purpose of the Annual Energy Output calculation.

As discussed in BC Hydro’s response to BCOAPO IR 1.5.3:

- **The purpose of the Annual Energy Output calculation is to support the objective of maintaining the Program as a load offset program;**
- **BC Hydro is proposing to update the Energy Price so that it better reflects the value of the energy to non-participating customers which will mitigate the cost-shifting associated with Surplus Energy Payments that may arise from underestimating Annual Energy Output; and**
- **BC Hydro does not have sufficient data to review the fixed capacity factors used to estimate Annual Energy Output.**

As discussed in BC Hydro’s response to BCUC IR 1.6.2:

- **The capacity factor for the same type of generation can differ depending on the geographical location of the Generating Facility due to factors such as on-site conditions; and**
- **Using a fixed capacity factor for each generation type minimizes administrative burden and costs and supports a consistent and transparent calculation of Annual Energy Output.**

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**16.0 Reference: Exhibit B-5, BCSEA 1.15.3.2
 Exhibit B-5, CEC 1.10.3**

2.16.2 Alternatively, if the capacity factors are known to underestimate the Annual Energy Output, why is it necessary to also use 110% (as opposed to 100% - per CEC 1.10.3) in determining the allowed size of the generation?

RESPONSE:

The proposed Rate Schedule 1289 requires that, at the time of a customer's Net Metering application, the Generating Facility's Annual Energy Output not exceed 110 per cent of the Annual Load. The purpose of this requirement is to support the objective of maintaining the Program as a load offset program.

At the time the customer submits a Net Metering application, there is often uncertainty regarding the customer's future annual load. The intent of allowing Annual Energy Output to be up to 110 per cent of Annual Load, instead of 100 per cent of Annual Load, is to allow for moderate customer load growth that may occur after the customer begins generating. As stated in the section 2.6 of the Application, this responds to feedback that BC Hydro has received and is consistent with the practice of other utilities that have net metering programs and provide Surplus Energy Payments.

Please also refer to BC Hydro's response to BCOAPO IR 1.5.3 where we explain that in order to mitigate the cost-shifting associated with Surplus Energy Payments, BC Hydro is proposing to update the Energy Price so that it better reflects the value of the energy to non-participating customers.

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17.0 Reference: Exhibit B-3, BCUC 1.8.2

2.17.1 If cost is the concern and/or gaming is the concern, why not allow customers to periodically (e.g., once every 3 years) reset their anniversary date and charge a cost-based fee?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 2.28.1 for a discussion as to why BC Hydro does not believe it is appropriate to allow customers to change their Anniversary Date from time to time.

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18.0 Reference: Exhibit B-3, BCUC 1.5.1 and BCCSC 1.6.13

The response states: “participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants”.

2.18.1 Please provide any evidence BC Hydro has that participating customers typically have lower load factors than non-participants.

RESPONSE:

BC Hydro analyzed the fiscal 2016 load factors of customers in the Program (i.e., customers on Rate Schedule 1289) that take service under Rate Schedule 1101 (Residential Service), compared to all other Rate Schedule 1101 customers.

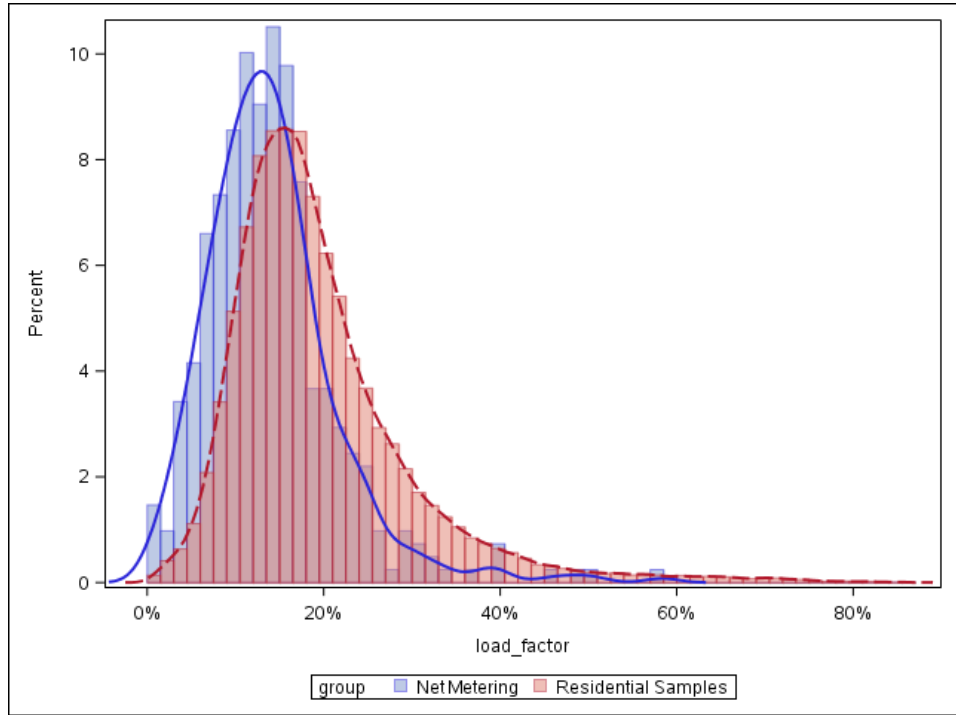
This information is presented in Table 1 and Figure 1, below. As shown, Residential customers on Rate Schedule 1289 have lower load factors compared to all Residential customers.

Table 1 Load Factors in Fiscal 2016 for Net Metering Customers that take Service under RS 1101, compared to all RS1101 Customers

Group	Mean (%)	Median (%)	Minimum (%)	Maximum (%)
Net Metering taking service under RS1101	14	13	1	58
All Residential (RS1101)	20	17	0	86

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Figure 1: Distribution of Load Factor in Fiscal 2016 for Net Metering Customers that take Service under RS 1101, compared to all RS 1101 Customers



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18.0 Reference: Exhibit B-3, BCUC 1.5.1 and BCCSC 1.6.13

The response states: “participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants”.

2.18.2 In the context of this statement, how is load factor determined? Is the customer’ load factor based on the customer’s maximum peak demand, is it the customer’s load factor when demand (i.e., the denominator in the determination of load factor) is based on the customer’s demand at the time of BC Hydro’s peak demand or some other measure of “load factor”?

RESPONSE:

Load factor was calculated by comparing the customer’s maximum peak demand to the customer’s annual energy use.

The peak demand of customers in the Program that take service under Rate Schedule 1101 generally coincides with the peak demand of all Rate Schedule 1101 customers, and with BC Hydro’s system peak demand.

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18.0 Reference: Exhibit B-3, BCUC 1.5.1 and BCCSC 1.6.13

The response states: “participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants”.

2.18.3 Based on the response to BCCSC 1.6.13, please confirm that the statement is correct if customers’ load factors are based on demand coincident with BC Hydro’s peak demand?

RESPONSE:

It is correct to state that customers in the Program still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants.

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18.0 Reference: Exhibit B-3, BCUC 1.5.1 and BCCSC 1.6.13

The response states: “participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants”.

2.18.3 Based on the response to BCCSC 1.6.13, please confirm that the statement is correct if customers’ load factors are based on demand coincident with BC Hydro’s peak demand?

2.18.3.1 If not, please explain why.

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.18.3.

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18.0 Reference: Exhibit B-3, BCUC 1.5.1 and BCCSC 1.6.13

The response states: “participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants”.

2.18.4 Based on the response to BCCSC 1.16.3, please confirm that the statement is correct if the customers’ load factors are based on demand coincident with the peak demand for the customer’s rate class? Note: In the response, please address each of the rate classes where there are customers on RS 1289.

RESPONSE:

BC Hydro has only analyzed the load factor for customers in the Program that take service under Rate Schedule 1101 (Residential Service).

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18.0 Reference: Exhibit B-3, BCUC 1.5.1 and BCCSC 1.6.13

The response states: “participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants”.

2.18.4 Based on the response to BCCSC 1.16.3, please confirm that the statement is correct if the customers’ load factors are based on demand coincident with the peak demand for the customer’s rate class? Note: In the response, please address each of the rate classes where there are customers on RS 1289.

2.18.4.1 If not, please explain why.

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.18.4.

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19.0 Reference: Exhibit B-3, BCUC 1.12.2 and BCUC 1.12.4

BCUC 1.12.2 requested the daily average Mid-C market price during light load hours and heavy load hours as well as the daily average, for each day, in the previous year. The response was provided on a confidential basis. However, the overall average values for each month were provided in the response to BCUC 1.12.4.

2.19.1 Is BC Hydro able to provide the data in a more disaggregated form than BCUC 1.12.4 on a non-confidential basis? If so, please do so in response to this IR.

RESPONSE:

BC Hydro is unable to provide the information requested on a non-confidential basis as it is proprietary to Intercontinental Exchange and BC Hydro is subject to non-disclosure obligations through our subscription agreement.

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19.0 Reference: Exhibit B-3, BCUC 1.12.2 and BCUC 1.12.4

BCUC 1.12.2 requested the daily average Mid-C market price during light load hours and heavy load hours as well as the daily average, for each day, in the previous year. The response was provided on a confidential basis. However, the overall average values for each month were provided in the response to BCUC 1.12.4.

2.19.2 In particular, can BC Hydro provide the data for 2018 regarding the monthly average Mid-C Market price during light load hours and heavy load hours for each month of the year? If yes, please do so. If not, please explain specifically why this information cannot be provided in the context of this public hearing.

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.19.1.

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20.0 Reference: Exhibit B-3, BCUC 1.12.3

2.20.1 Please provide a schedule that sets out the monthly values for surplus energy (i.e., out flow) from solar PV broken down as between light load and heavy load hours.

RESPONSE:

The table below provides total monthly net generation (outflow) supplied to BC Hydro by Program customers with solar PV¹ Generating Facilities in 2018, with a breakdown between Light Load Hours (LLH) and Heavy Load Hours (HLH).

This breakdown is based on the data from BC Hydro's revised response to BCUC IR 1.12.3 which is provided as Attachment 1 to BC Hydro's response to BCOAPO IR 2.22.1.

Month	LLH (kWh)	HLH (kWh)	All hours (kWh)
January	5,812	25,842	31,654
February	17,299	75,927	93,226
March	42,568	238,283	280,851
April	75,148	334,743	409,891
May	145,449	660,835	806,284
June	90,218	568,595	658,813
July	186,312	726,461	912,773
August	86,746	628,340	715,086
September	88,717	404,169	492,886
October	48,065	314,170	362,235
November	24,308	93,242	117,550
December	10,328	44,413	54,741
Total	820,970	4,115,020	4,935,990

¹ Includes a small number of wind, wind and PV and biogas generating facilities.

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20.0 Reference: Exhibit B-3, BCUC 1.12.3

2.20.2 Please provide a schedule that set out the monthly values for surplus energy (i.e., outflow) from hydro-electric broken down as between light load and heavy load hours.

RESPONSE:

The table below provides total monthly net generation (outflow) supplied to BC Hydro by Program customers with hydroelectric Generating Facilities in 2018, with a breakdown between Light Load Hours (LLH) and Heavy Load Hours (HLH).

This breakdown is based on the data from BC Hydro's revised response to BCUC IR 1.12.3 which is provided as Attachment 1 to BC Hydro's response to BCOAPO IR 2.22.1.

Month	LLH (kWh)	HLH (kWh)	All hours (kWh)
January	58,686	72,923	131,609
February	50,528	66,113	116,641
March	55,156	75,265	130,421
April	53,200	68,379	121,579
May	71,283	88,161	159,444
June	85,455	115,450	200,905
July	101,355	114,499	215,854
August	86,413	114,428	200,841
September	86,710	96,797	183,507
October	57,174	81,376	138,550
November	74,373	92,031	166,404
December	68,522	76,044	144,566
Total	848,855	1,061,466	1,910,321

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21.0 Reference:

Exhibit B-3, BCUC 1.10.2 and BCUC 1.12.3

The response to BCUC 1.10.2 states: “BC Hydro has not determined the degree to which aggregate generation from customers in the Program can be relied upon over the long-term and, to date, has not considered the potential energy contribution from customers in the Program to be sufficiently large to include in our long-term planning”.

- 2.21.1 Has BC Hydro looked at the consistency of net metering customers’ delivery of surplus energy to the system (i.e., is the delivery of surplus energy to the system consistent, on a year to year basis, in terms of when it occurs during the year and, in particular, the consistency in terms of the amounts (% of total) delivered in during BC Hydro’s peak periods for i) solar PV and ii) hydro-electric facilities?

RESPONSE:

BC Hydro has reviewed annual volumes of excess energy and associated Surplus Energy Payments but has not analyzed the net generation (outflow) of energy to the grid and its characteristics. BC Hydro will be looking at these characteristics in its next Net Metering Evaluation Report. For further discussion on the timing and scope of this report, please refer to BC Hydro’s response to BCUC IR 2.25.1.

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21.0 Reference:

Exhibit B-3, BCUC 1.10.2 and BCUC 1.12.3

The response to BCUC 1.10.2 states: “BC Hydro has not determined the degree to which aggregate generation from customers in the Program can be relied upon over the long-term and, to date, has not considered the potential energy contribution from customers in the Program to be sufficiently large to include in our long-term planning”.

2.21.1 Has BC Hydro looked at the consistency of net metering customers’ delivery of surplus energy to the system (i.e., is the delivery of surplus energy to the system consistent, on a year to year basis, in terms of when it occurs during the year and, in particular, the consistency in terms of the amounts (% of total) delivered in during BC Hydro’s peak periods for i) solar PV and ii) hydro-electric facilities?

2.21.1.1 If yes, what were the results?

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.21.1.

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22.0 Reference: Exhibit B-3, BCUC 1.12.4

2.22.1 Please revise the schedule provided in the response so as to differentiate (for each month) between surplus energy deliveries in the light load and heavy load hours.

RESPONSE:

In responding to this question, BC Hydro noticed that the breakdown between Light Load Hours (LLH) and Heavy Load Hours (HLH) provided in BC Hydro's response to BCUC IR 1.12.3 was incorrect. Attachment 1 to this response provides the corrected data.

The table below provides total monthly net generation (outflow) supplied to BC Hydro by Program customers in 2018 with a breakdown between LLH and HLH based on the corrected daily data provided in Attachment 1 to this response.

Month	LLH (kWh)	HLH (kWh)	All hours (kWh)
January	64,498	98,765	163,263
February	67,827	142,040	209,867
March	97,724	313,548	411,272
April	128,348	403,122	531,470
May	216,732	748,996	965,728
June	175,673	684,045	859,718
July	287,667	840,960	1,128,627
August	173,159	742,768	915,927
September	175,427	500,966	676,393
October	105,239	395,546	500,785
November	98,681	185,273	283,954
December	78,850	120,457	199,307
Total	1,669,825	5,176,486	6,846,311

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12.0 D. PRICE OF SURPLUS ENERGY

**Reference: PRICE OF SURPLUS ENERGY
 Exhibit B-1, p. 7
 Average of daily average Mid-C market price**

BC Hydro states on page 7 of its Application:

BC Hydro is proposing to update the Energy Price paid for the Generation Account Balance remaining in the Customer’s Generation Account at their Anniversary Date from 9.99 cents per kWh to an amount that reflects the price BC Hydro can sell the electricity for on the regional wholesale market. This amount would be determined every January 1st based on the daily average Mid-Columbia prices for the previous calendar year, converted to Canadian dollars using the average annual exchange rate from the Bank of Canada for that year.

1.12.3 Please provide, in table form and in a line graph, the total daily Net Generation supplied to BC Hydro by NM customers for each day in the previous year during i) light load hours and ii) heavy load hours for each generation type, respectively.

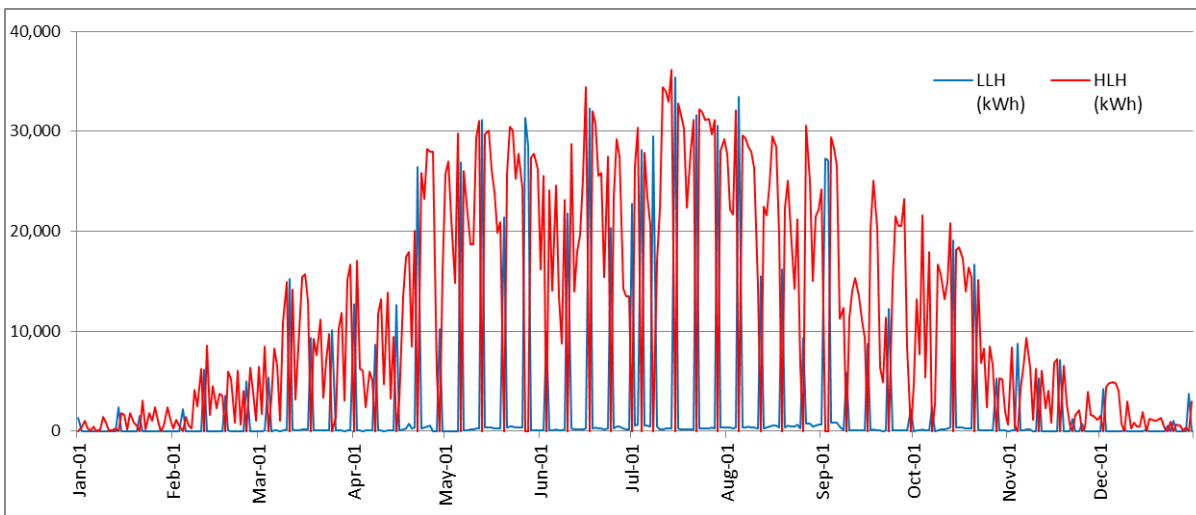
RESPONSE:

The graphs below provide the total net generation (outflow) for each day in 2018 during Light Load Hours (LLH) and Heavy Load Hours (HLH) for solar PV (including wind, wind and PV, biogas) and hydroelectric generation.

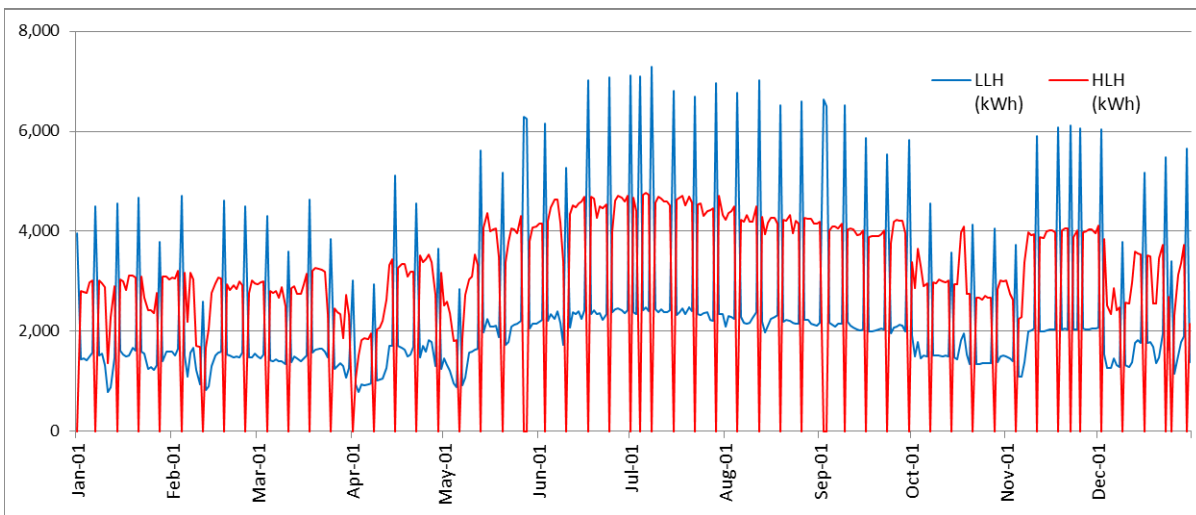
Attachment 1 to this response provides tables with the total net generation (outflow) for each day in 2018 during Light Load Hours (LLH) and Heavy Load Hours (HLH).

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Solar PV (including wind, wind and PV, biogas) total net generation (outflow) for each day in 2018:



Hydroelectric total net generation (outflow) for each day in 2018:



Total Daily Net Generation Supplied to BC Hydro by NM Customers in 2018

Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Jan-01	3,960	3,960	0	1,325	1,325	0
Jan-02	4,254	1,441	2,813	446	8	438
Jan-03	4,235	1,451	2,784	1,016	10	1,006
Jan-04	4,196	1,430	2,766	244	10	234
Jan-05	4,459	1,489	2,970	145	12	133
Jan-06	4,586	1,569	3,017	476	14	462
Jan-07	4,505	4,505	0	101	101	0
Jan-08	4,529	1,517	3,012	184	15	169
Jan-09	4,532	1,565	2,967	1,455	15	1,440
Jan-10	4,205	1,324	2,881	880	13	867
Jan-11	2,146	777	1,369	141	14	127
Jan-12	3,179	884	2,295	116	12	104
Jan-13	4,395	1,487	2,908	262	13	249
Jan-14	4,558	4,558	0	2,372	2,372	0
Jan-15	4,655	1,610	3,045	1,883	17	1,866
Jan-16	4,526	1,536	2,990	1,629	18	1,611
Jan-17	4,335	1,504	2,831	168	16	152
Jan-18	4,620	1,512	3,108	1,821	16	1,805
Jan-19	4,779	1,670	3,109	892	15	877
Jan-20	4,691	1,608	3,083	595	14	581
Jan-21	4,664	4,664	0	1,544	1,544	0
Jan-22	4,697	1,599	3,098	3,087	20	3,067
Jan-23	4,218	1,550	2,668	225	13	212
Jan-24	3,676	1,257	2,419	1,862	14	1,848
Jan-25	3,696	1,282	2,414	1,096	17	1,079
Jan-26	3,601	1,230	2,371	2,392	18	2,374
Jan-27	4,096	1,321	2,775	1,031	12	1,019
Jan-28	3,789	3,789	0	94	94	0
Jan-29	4,489	1,400	3,089	586	14	572
Jan-30	4,694	1,595	3,099	2,417	17	2,400
Jan-31	4,644	1,602	3,042	1,169	19	1,150
Feb-01	4,684	1,603	3,081	293	11	282
Feb-02	4,571	1,524	3,047	1,207	13	1,194
Feb-03	4,847	1,646	3,201	606	13	593
Feb-04	4,711	4,711	0	2,162	2,162	0
Feb-05	4,684	1,510	3,174	1,478	13	1,465
Feb-06	3,277	1,088	2,189	554	12	542
Feb-07	4,756	1,576	3,180	316	12	304
Feb-08	4,714	1,669	3,045	4,151	19	4,132
Feb-09	2,929	1,225	1,704	2,555	16	2,539
Feb-10	2,638	943	1,695	6,322	19	6,303
Feb-11	2,603	2,603	0	6,147	6,147	0
Feb-12	2,493	823	1,670	8,633	22	8,611
Feb-13	2,956	899	2,057	1,632	13	1,619

BCOAPO IR 2.22.1 Attachment 1

Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Feb-14	4,077	1,308	2,769	4,576	28	4,548
Feb-15	4,492	1,526	2,966	2,353	16	2,337
Feb-16	4,647	1,579	3,068	3,761	24	3,737
Feb-17	4,647	1,596	3,051	3,626	22	3,604
Feb-18	4,621	4,621	0	3,545	3,545	0
Feb-19	4,477	1,528	2,949	5,992	41	5,951
Feb-20	4,333	1,508	2,825	5,250	38	5,212
Feb-21	4,397	1,484	2,913	862	9	853
Feb-22	4,354	1,504	2,850	6,123	34	6,089
Feb-23	4,473	1,482	2,991	678	10	668
Feb-24	4,496	1,566	2,930	4,082	20	4,062
Feb-25	4,491	4,491	0	4,958	4,958	0
Feb-26	4,235	1,471	2,764	6,413	33	6,380
Feb-27	4,513	1,487	3,026	3,845	34	3,811
Feb-28	4,525	1,557	2,968	1,106	15	1,091
Mar-01	4,452	1,502	2,950	6,470	38	6,432
Mar-02	4,441	1,459	2,982	1,761	22	1,739
Mar-03	4,530	1,537	2,993	8,554	41	8,513
Mar-04	4,315	4,315	0	5,420	5,420	0
Mar-05	4,225	1,423	2,802	3,416	30	3,386
Mar-06	4,171	1,404	2,767	8,313	62	8,251
Mar-07	4,229	1,431	2,798	6,624	65	6,559
Mar-08	4,082	1,411	2,671	1,075	38	1,037
Mar-09	4,278	1,394	2,884	11,000	77	10,923
Mar-10	3,835	1,337	2,498	15,060	145	14,915
Mar-11	3,600	3,600	0	15,236	15,236	0
Mar-12	4,257	1,390	2,867	14,319	151	14,168
Mar-13	4,396	1,492	2,904	3,275	81	3,194
Mar-14	4,202	1,462	2,740	8,526	108	8,418
Mar-15	4,149	1,403	2,746	15,605	149	15,456
Mar-16	4,393	1,454	2,939	15,846	158	15,688
Mar-17	4,667	1,510	3,157	13,133	152	12,981
Mar-18	4,642	4,642	0	9,333	9,333	0
Mar-19	4,779	1,574	3,205	9,385	121	9,264
Mar-20	4,891	1,628	3,263	7,708	111	7,597
Mar-21	4,913	1,656	3,257	11,316	126	11,190
Mar-22	4,882	1,643	3,239	3,422	90	3,332
Mar-23	4,787	1,597	3,190	7,250	134	7,116
Mar-24	3,804	1,486	2,318	9,845	134	9,711
Mar-25	3,836	3,836	0	10,137	10,137	0
Mar-26	3,713	1,248	2,465	1,510	49	1,461
Mar-27	3,682	1,306	2,376	10,348	59	10,289
Mar-28	3,706	1,371	2,335	11,886	79	11,807
Mar-29	3,163	1,304	1,859	3,122	36	3,086
Mar-30	3,802	1,067	2,735	15,190	89	15,101
Mar-31	3,599	1,274	2,325	16,766	97	16,669

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Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Apr-01	3,014	3,014	0	12,718	12,718	0
Apr-02	2,005	945	1,060	17,141	113	17,028
Apr-03	2,306	787	1,519	6,339	60	6,279
Apr-04	2,764	930	1,834	6,084	39	6,045
Apr-05	2,771	916	1,855	2,414	46	2,368
Apr-06	2,769	930	1,839	6,057	72	5,985
Apr-07	2,925	963	1,962	5,234	100	5,134
Apr-08	2,945	2,945	0	8,660	8,660	0
Apr-09	3,052	1,023	2,029	11,897	131	11,766
Apr-10	3,097	1,030	2,067	13,226	60	13,166
Apr-11	3,274	1,060	2,214	4,708	30	4,678
Apr-12	3,902	1,261	2,641	13,883	53	13,830
Apr-13	5,019	1,700	3,319	3,334	41	3,293
Apr-14	5,144	1,703	3,441	9,523	56	9,467
Apr-15	5,112	5,112	0	12,656	12,656	0
Apr-16	4,976	1,703	3,273	3,192	48	3,144
Apr-17	5,010	1,670	3,340	13,714	207	13,507
Apr-18	4,977	1,627	3,350	17,773	296	17,477
Apr-19	4,582	1,495	3,087	18,684	750	17,934
Apr-20	4,735	1,544	3,191	8,755	307	8,448
Apr-21	4,866	1,684	3,182	20,399	334	20,065
Apr-22	4,565	4,565	0	26,385	26,385	0
Apr-23	5,008	1,483	3,525	26,194	320	25,874
Apr-24	5,097	1,706	3,391	23,566	338	23,228
Apr-25	5,023	1,585	3,438	28,764	494	28,270
Apr-26	5,365	1,821	3,544	28,461	534	27,927
Apr-27	5,178	1,791	3,387	27,981	39	27,942
Apr-28	4,028	1,306	2,722	5,876	19	5,857
Apr-29	3,644	3,644	0	10,221	10,221	0
Apr-30	4,426	1,257	3,169	16,052	21	16,031
May-01	3,966	1,451	2,515	25,788	32	25,756
May-02	3,921	1,326	2,595	27,056	35	27,021
May-03	3,570	1,202	2,368	21,373	37	21,336
May-04	2,754	952	1,802	14,889	33	14,856
May-05	2,712	885	1,827	29,775	33	29,742
May-06	2,838	2,838	0	26,883	26,883	0
May-07	2,790	923	1,867	26,059	44	26,015
May-08	3,792	1,069	2,723	22,916	132	22,784
May-09	4,603	1,571	3,032	18,863	177	18,686
May-10	4,672	1,586	3,086	18,892	203	18,689
May-11	5,168	1,634	3,534	29,658	263	29,395
May-12	4,986	1,652	3,334	31,356	316	31,040
May-13	5,610	5,610	0	31,090	31,090	0
May-14	6,042	1,975	4,067	30,041	371	29,670
May-15	6,609	2,250	4,359	30,534	418	30,116
May-16	6,078	2,088	3,990	26,471	353	26,118

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Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
May-17	6,134	2,101	4,033	24,202	312	23,890
May-18	6,153	2,105	4,048	20,133	283	19,850
May-19	5,365	1,892	3,473	21,254	301	20,953
May-20	5,173	5,173	0	21,400	21,400	0
May-21	5,118	1,727	3,391	26,068	358	25,710
May-22	5,573	1,783	3,790	30,973	474	30,499
May-23	6,163	2,101	4,062	30,545	504	30,041
May-24	6,163	2,129	4,034	25,678	417	25,261
May-25	6,107	2,152	3,955	28,199	413	27,786
May-26	6,517	2,214	4,303	24,648	380	24,268
May-27	6,299	6,299	0	31,366	31,366	0
May-28	6,247	6,247	0	28,510	28,510	0
May-29	5,857	2,047	3,810	27,451	113	27,338
May-30	6,224	2,156	4,068	27,903	104	27,799
May-31	6,240	2,145	4,095	26,310	94	26,216
Jun-01	6,345	2,191	4,154	16,255	62	16,193
Jun-02	6,386	2,236	4,150	25,670	80	25,590
Jun-03	6,161	6,161	0	9,937	9,937	0
Jun-04	6,424	2,214	4,210	24,199	92	24,107
Jun-05	6,843	2,353	4,490	14,150	76	14,074
Jun-06	6,888	2,257	4,631	24,751	145	24,606
Jun-07	7,034	2,402	4,632	13,644	120	13,524
Jun-08	6,346	2,171	4,175	8,848	82	8,766
Jun-09	5,107	1,725	3,382	23,336	170	23,166
Jun-10	5,263	5,263	0	21,746	21,746	0
Jun-11	6,415	2,069	4,346	29,008	281	28,727
Jun-12	6,911	2,387	4,524	14,122	181	13,941
Jun-13	6,827	2,350	4,477	18,220	179	18,041
Jun-14	6,960	2,397	4,563	19,856	202	19,654
Jun-15	6,857	2,254	4,603	25,574	222	25,352
Jun-16	7,113	2,415	4,698	34,729	304	34,425
Jun-17	7,024	7,024	0	32,296	32,296	0
Jun-18	7,036	2,344	4,692	32,359	307	32,052
Jun-19	7,073	2,412	4,661	31,055	346	30,709
Jun-20	6,624	2,353	4,271	25,853	310	25,543
Jun-21	6,872	2,366	4,506	26,136	306	25,830
Jun-22	6,685	2,228	4,457	15,662	202	15,460
Jun-23	6,879	2,339	4,540	27,711	248	27,463
Jun-24	7,084	7,084	0	20,311	20,311	0
Jun-25	6,373	2,381	3,992	23,705	322	23,383
Jun-26	7,054	2,435	4,619	29,732	496	29,236
Jun-27	7,158	2,453	4,705	27,944	488	27,456
Jun-28	7,088	2,418	4,670	14,570	277	14,293
Jun-29	6,950	2,355	4,595	13,686	208	13,478
Jun-30	7,125	2,418	4,707	13,748	222	13,526
Jul-01	7,117	7,117	0	22,785	22,785	0

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Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Jul-02	7,054	2,382	4,672	27,016	554	26,462
Jul-03	6,751	2,342	4,409	31,072	705	30,367
Jul-04	7,096	7,096	0	28,186	28,186	0
Jul-05	7,162	2,429	4,733	28,398	587	27,811
Jul-06	7,250	2,477	4,773	23,850	536	23,314
Jul-07	7,140	2,402	4,738	21,100	500	20,600
Jul-08	7,290	7,290	0	29,499	29,499	0
Jul-09	7,016	2,440	4,576	17,505	427	17,078
Jul-10	7,080	2,386	4,694	22,464	231	22,233
Jul-11	7,078	2,432	4,646	34,648	214	34,434
Jul-12	6,969	2,379	4,590	34,297	241	34,056
Jul-13	6,965	2,377	4,588	33,272	304	32,968
Jul-14	6,937	2,419	4,518	36,437	252	36,185
Jul-15	6,815	6,815	0	35,368	35,368	0
Jul-16	6,958	2,321	4,637	33,056	239	32,817
Jul-17	7,048	2,379	4,669	31,878	226	31,652
Jul-18	7,177	2,458	4,719	30,452	212	30,240
Jul-19	6,870	2,347	4,523	22,575	190	22,385
Jul-20	7,157	2,474	4,683	28,242	159	28,083
Jul-21	6,977	2,400	4,577	31,262	161	31,101
Jul-22	6,703	6,703	0	31,589	31,589	0
Jul-23	6,885	2,337	4,548	32,554	317	32,237
Jul-24	6,890	2,326	4,564	32,191	299	31,892
Jul-25	6,658	2,356	4,302	31,417	276	31,141
Jul-26	6,783	2,374	4,409	31,584	325	31,259
Jul-27	6,657	2,232	4,425	30,010	340	29,670
Jul-28	6,681	2,217	4,464	31,463	303	31,160
Jul-29	6,971	6,971	0	30,557	30,557	0
Jul-30	7,050	2,341	4,709	28,447	351	28,096
Jul-31	6,669	2,336	4,333	29,599	379	29,220
Aug-01	6,342	2,102	4,240	28,042	356	27,686
Aug-02	6,667	2,306	4,361	22,544	352	22,192
Aug-03	6,692	2,279	4,413	22,040	314	21,726
Aug-04	6,745	2,243	4,502	32,519	397	32,122
Aug-05	6,771	6,771	0	33,417	33,417	0
Aug-06	6,524	2,285	4,239	29,949	400	29,549
Aug-07	6,375	2,177	4,198	29,709	423	29,286
Aug-08	6,467	2,147	4,320	28,840	430	28,410
Aug-09	6,371	2,177	4,194	28,314	395	27,919
Aug-10	6,470	2,269	4,201	26,715	386	26,329
Aug-11	6,879	2,385	4,494	14,710	250	14,460
Aug-12	7,020	7,020	0	15,480	15,480	0
Aug-13	6,489	2,197	4,292	22,711	281	22,430
Aug-14	5,919	1,984	3,935	21,932	345	21,587
Aug-15	6,271	2,106	4,165	25,217	451	24,766
Aug-16	6,516	2,239	4,277	30,007	533	29,474

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Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Aug-17	6,554	2,287	4,267	29,010	528	28,482
Aug-18	6,467	2,318	4,149	19,925	391	19,534
Aug-19	6,519	6,519	0	16,234	16,234	0
Aug-20	6,427	2,189	4,238	22,759	387	22,372
Aug-21	6,446	2,228	4,218	25,605	553	25,052
Aug-22	6,546	2,218	4,328	19,178	479	18,699
Aug-23	6,133	2,178	3,955	14,743	449	14,294
Aug-24	6,361	2,151	4,210	21,794	622	21,172
Aug-25	6,313	2,155	4,158	6,901	310	6,591
Aug-26	6,607	6,607	0	9,360	9,360	0
Aug-27	6,495	2,230	4,265	31,259	736	30,523
Aug-28	6,482	2,224	4,258	25,747	771	24,976
Aug-29	6,402	2,161	4,241	15,505	492	15,013
Aug-30	6,294	2,139	4,155	22,100	567	21,533
Aug-31	6,277	2,122	4,155	22,820	657	22,163
Sep-01	6,366	2,177	4,189	24,882	691	24,191
Sep-02	6,627	6,627	0	27,241	27,241	0
Sep-03	6,494	6,494	0	27,132	27,132	0
Sep-04	6,193	2,169	4,024	30,256	813	29,443
Sep-05	6,213	2,126	4,087	29,137	833	28,304
Sep-06	6,198	2,100	4,098	27,353	839	26,514
Sep-07	6,202	2,143	4,059	11,663	427	11,236
Sep-08	6,312	2,153	4,159	12,429	83	12,346
Sep-09	6,524	6,524	0	5,876	5,876	0
Sep-10	6,228	2,184	4,044	11,404	48	11,356
Sep-11	6,163	2,115	4,048	14,096	58	14,038
Sep-12	6,118	2,071	4,047	15,394	84	15,310
Sep-13	5,959	2,039	3,920	13,611	86	13,525
Sep-14	5,968	2,024	3,944	11,234	70	11,164
Sep-15	6,067	2,045	4,022	9,442	81	9,361
Sep-16	5,866	5,866	0	8,733	8,733	0
Sep-17	5,879	1,994	3,885	20,295	81	20,214
Sep-18	5,907	1,996	3,911	25,191	136	25,055
Sep-19	5,920	2,012	3,908	20,368	129	20,239
Sep-20	5,938	2,031	3,907	6,406	61	6,345
Sep-21	6,004	2,058	3,946	4,945	37	4,908
Sep-22	6,059	2,038	4,021	11,428	64	11,364
Sep-23	5,532	5,532	0	12,274	12,274	0
Sep-24	5,722	1,961	3,761	15,040	103	14,937
Sep-25	6,276	2,079	4,197	21,664	123	21,541
Sep-26	6,334	2,102	4,232	20,641	125	20,516
Sep-27	6,346	2,126	4,220	20,589	77	20,512
Sep-28	6,324	2,109	4,215	23,355	87	23,268
Sep-29	5,946	1,993	3,953	8,550	68	8,482
Sep-30	5,822	5,822	0	2,257	2,257	0
Oct-01	5,298	1,922	3,376	4,763	20	4,743

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	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Oct-02	4,352	1,491	2,861	13,248	84	13,164
Oct-03	5,439	1,795	3,644	7,774	75	7,699
Oct-04	4,772	1,461	3,311	21,736	169	21,567
Oct-05	4,419	1,513	2,906	5,452	73	5,379
Oct-06	4,459	1,494	2,965	18,062	118	17,944
Oct-07	4,549	4,549	0	2,378	2,378	0
Oct-08	4,504	1,519	2,985	2,698	20	2,678
Oct-09	4,477	1,508	2,969	16,775	113	16,662
Oct-10	4,555	1,514	3,041	15,867	182	15,685
Oct-11	4,501	1,498	3,003	13,410	196	13,214
Oct-12	4,486	1,513	2,973	15,145	246	14,899
Oct-13	4,518	1,507	3,011	21,185	336	20,849
Oct-14	3,581	3,581	0	19,062	19,062	0
Oct-15	4,412	1,471	2,941	18,507	348	18,159
Oct-16	4,386	1,447	2,939	18,795	373	18,422
Oct-17	5,811	1,827	3,984	17,615	360	17,255
Oct-18	6,048	1,958	4,090	14,248	315	13,933
Oct-19	4,286	1,540	2,746	16,705	323	16,382
Oct-20	4,096	1,351	2,745	15,756	307	15,449
Oct-21	4,129	4,129	0	16,659	16,659	0
Oct-22	4,026	1,346	2,680	15,368	197	15,171
Oct-23	4,010	1,342	2,668	6,924	128	6,796
Oct-24	4,000	1,358	2,642	8,368	128	8,240
Oct-25	4,058	1,356	2,702	2,433	58	2,375
Oct-26	4,035	1,363	2,672	8,632	118	8,514
Oct-27	4,044	1,365	2,679	6,722	109	6,613
Oct-28	4,057	4,057	0	5,317	5,317	0
Oct-29	4,224	1,384	2,840	5,368	91	5,277
Oct-30	4,511	1,500	3,011	5,309	102	5,207
Oct-31	4,507	1,515	2,992	1,954	60	1,894
Nov-01	4,531	1,506	3,025	729	21	708
Nov-02	4,208	1,451	2,757	8,489	126	8,363
Nov-03	4,034	1,397	2,637	575	50	525
Nov-04	3,725	3,725	0	8,772	8,772	0
Nov-05	3,340	1,090	2,250	4,365	93	4,272
Nov-06	3,380	1,101	2,279	6,528	122	6,406
Nov-07	4,755	1,374	3,381	9,539	192	9,347
Nov-08	5,984	1,995	3,989	6,495	142	6,353
Nov-09	5,928	2,014	3,914	1,156	8	1,148
Nov-10	5,991	2,050	3,941	6,279	34	6,245
Nov-11	5,914	5,914	0	5,336	5,336	0
Nov-12	5,881	2,001	3,880	6,044	25	6,019
Nov-13	5,857	1,989	3,868	2,322	12	2,310
Nov-14	6,008	2,013	3,995	4,063	22	4,041
Nov-15	6,041	2,030	4,011	901	16	885
Nov-16	6,067	2,044	4,023	6,914	36	6,878

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	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Nov-17	6,009	2,030	3,979	7,261	29	7,232
Nov-18	6,077	6,077	0	7,157	7,157	0
Nov-19	6,050	2,027	4,023	6,568	25	6,543
Nov-20	6,105	2,050	4,055	2,783	11	2,772
Nov-21	6,094	2,033	4,061	801	10	791
Nov-22	6,108	6,108	0	1,203	1,203	0
Nov-23	5,916	2,028	3,888	1,686	10	1,676
Nov-24	6,066	2,039	4,027	2,124	9	2,115
Nov-25	6,063	6,063	0	781	781	0
Nov-26	6,040	2,051	3,989	381	10	371
Nov-27	6,049	2,040	4,009	3,984	21	3,963
Nov-28	6,073	2,031	4,042	1,619	13	1,606
Nov-29	6,088	2,049	4,039	1,531	11	1,520
Nov-30	6,022	2,053	3,969	1,164	11	1,153
Dec-01	6,195	2,081	4,114	1,570	11	1,559
Dec-02	6,035	6,035	0	4,274	4,274	0
Dec-03	5,381	1,545	3,836	4,446	23	4,423
Dec-04	3,790	1,268	2,522	4,857	22	4,835
Dec-05	3,599	1,264	2,335	4,951	28	4,923
Dec-06	4,310	1,454	2,856	4,879	24	4,855
Dec-07	3,739	1,323	2,416	4,034	19	4,015
Dec-08	3,765	1,279	2,486	798	6	792
Dec-09	3,796	3,796	0	179	179	0
Dec-10	3,887	1,317	2,570	2,980	18	2,962
Dec-11	3,839	1,288	2,551	315	9	306
Dec-12	4,355	1,382	2,973	870	11	859
Dec-13	5,374	1,774	3,600	500	6	494
Dec-14	5,376	1,819	3,557	438	6	432
Dec-15	5,305	1,776	3,529	1,961	15	1,946
Dec-16	5,176	5,176	0	182	182	0
Dec-17	5,282	1,773	3,509	1,252	16	1,236
Dec-18	5,291	1,787	3,504	1,211	21	1,190
Dec-19	4,236	1,687	2,549	1,093	20	1,073
Dec-20	3,932	1,371	2,561	1,179	12	1,167
Dec-21	4,940	1,475	3,465	1,395	18	1,377
Dec-22	5,686	1,950	3,736	331	13	318
Dec-23	5,487	5,487	0	543	543	0
Dec-24	4,319	1,632	2,687	984	13	971
Dec-25	3,394	3,394	0	1,007	1,007	0
Dec-26	3,472	1,151	2,321	684	11	673
Dec-27	4,643	1,515	3,128	567	9	558
Dec-28	5,137	1,779	3,358	51	5	46
Dec-29	5,630	1,899	3,731	412	9	403
Dec-30	5,656	5,656	0	3,775	3,775	0
Dec-31	3,539	1,389	2,150	3,023	23	3,000
Total	1,910,321	848,855	1,061,466	4,935,990	820,970	4,115,020

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22.0 Reference: Exhibit B-3, BCUC 1.12.4

2.22.2 What would be the average 2018 value for solar PV energy if the monthly solar PV energy from customers in the Program in light load and heavy load hours were valued at the average monthly Mid-C price in the light load hours and heavy load hours (respectively) in 2018?

RESPONSE:

In the Application, BC Hydro is proposing that the Energy Price be the average of the daily average Mid-Columbia market prices over the previous calendar year.

The average 2018 value for solar PV energy, if the monthly solar PV net generation (outflow) from customers¹ in the Program in Light Load Hours and Heavy Load Hours were valued at the average monthly Mid-C price in the Light Load Hours and Heavy Load Hours, respectively, would be 4.7 cents per kWh, which is higher than the average annual Mid-C price of 3.99 cents per kWh in 2018.

This methodology of calculating the value of net generation (outflow) energy to BC Hydro or any other methodology that seeks to apply a more granular accounting that takes into account the seasonal and daily patterns of the net generation (outflow), will likely result in a higher value for solar energy than a simple methodology than assumes the delivery of outflow energy is constant over the year. This logic holds true for solar outflow because of the seasonal and daily alignment with Mid-C prices, but may not be the case for other resource types where there is not an obvious alignment.

BC Hydro believes the simple methodology proposed in the Application for calculating the Energy Price is appropriate for solar resources as well as other resource types because:

- Outflow is not equivalent to the energy for which a customer receives a Surplus Energy Payment. A customer's Generation Account Balance is first applied against subsequent bill(s), at the customer's tariffed rate. The Energy Price only applies to the remaining Generation Account Balance at the customer's Anniversary Date; and**
- It is comparatively simple to administer and understand.**

¹ For the purposes of this analysis, "Solar PV energy from customers" includes the energy generated from customers with solar PV generation or any other kind of non-hydro generation.

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22.0 Reference: Exhibit B-3, BCUC 1.12.4

2.22.3 What would be the average 2018 value for hydro-electric energy if the monthly hydro-electric energy from customers in the Program in light load and heavy load hours were valued at the average monthly Mid-C price in the light load hours and heavy load hours (respectively) in 2018?

RESPONSE:

The average 2018 value for hydro electric energy, if the monthly hydro-electric energy from customers in the Program in Light Load and Heavy Load Hours were valued at the average monthly Mid-C price in the Light Load Hours and Heavy Load Hours, respectively, would be 4.2 cents per kWh. This result is very close to the average annual Mid-C price of 3.99 cents per kWh.

For further discussion on this approach compared to the approach that BC Hydro is proposing in the Application, please refer to BC Hydro's response to BCOAPO IR 2.22.2.

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23.0 Reference: Exhibit B-3, BCUC 1.12.7

2.23.1 Please confirm that while less frequent updates (through the use of a “threshold”) could increase year to year rate stability, it would also likely result in larger changes in the energy price paid to net metering customers in those years when a change is required.

RESPONSE:

Confirmed.

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23.0 Reference: Exhibit B-3, BCUC 1.12.7

2.23.1 Please confirm that while less frequent updates (through the use of a “threshold”) could increase year to year rate stability, it would also likely result in larger changes in the energy price paid to net metering customers in those years when a change is required.

2.23.1.1 If not confirmed, please explain why.

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.23.1

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24.0 Reference: Exhibit B-3, BCUC 1.14.2 and 1.14.2.1

2.24.1 Please provide a schedule that breaks down the 2018 Surplus Energy Outflows by Rate Class (e.g. Residential, Small General Service, etc.) for all rate classes with RS 1289 customers for 2018.

RESPONSE:

The table below provides a breakdown of 2018 net generation (outflow) by rate class for customers in the Program.

Rate Class	2018 Net Generation (Outflow) (kWh)
Residential	4,917,508
Small General Service	1,682,674
Medium General Service	217,229
Large General Service	27,104
Total	6,844,515

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24.0 Reference: Exhibit B-3, BCUC 1.14.2 and 1.14.2.1

2.24.2 On the same schedule set out the amount of output energy delivered in the winter evening hours considered to align with BC Hydro's system peak.

RESPONSE:

The table below provides the total amount of net generation (outflow) supplied to BC Hydro by customers in the Program during peak hours. For this response, peak hours are 4 pm – 10 pm, Nov through February inclusive, excluding weekends and holidays.

Rate Class	2018 Net Generation (Outflow) during winter peak hours (kWh)
Residential	53,073
Small General Service	56,286
Medium General Service	11
Large General Service	0
Total	109,370

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25.0 Reference: Exhibit B-5, BCOAPO 1.2.1 & 1.2.2

2.25.1 Please clarify whether the 1851 participants identified in Table 3 of the Application represent participants i) whose project is connected to BC Hydro's grid or ii) with accepted applications.

RESPONSE:

Table 3 of the Application refers to the total number of Net Metering customers connected to BC Hydro's grid as of March 1, 2019.

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26.0 Reference: Exhibit B-3, BCUC 1.12.3-Attachment 1 and BCOAPO 1.7.1

2.26.1 Please confirm that summing the daily values provided in BCUC 1.12.3 for each month of 2018 reconciles with the monthly values provided in the response to BCOAPO 1.7.1.

RESPONSE:

Not confirmed.

BC Hydro's response to BCUC IR 1.12.3 provides total net generation (outflow) for each month of 2018 while BC Hydro's response to BCOAPO IR 1.7.1 provides the monthly balance of the net energy credits recorded in customer Generation Accounts.

The difference is that the net energy credits recorded in the Generation Account takes the outflows for the month and subtracts any inflows to determine the net energy credit in the Generation Account.

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26.0 Reference: Exhibit B-3, BCUC 1.12.3-Attachment 1 and BCOAPO 1.7.1

2.26.1 Please confirm that summing the daily values provided in BCUC 1.12.3 for each month of 2018 reconciles with the monthly values provided in the response to BCOAPO 1.7.1.

2.26.1.1 If not confirmed, please explain why.

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.26.1.

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27.0 Reference: Exhibit B-5, BCOAPO 1.7.2

2.27.1 The original question was not requesting a breakdown of monthly surplus energy payments as the response implies. Rather, the question was seeking a breakdown of 2018 monthly surplus energy (per BCOAPO 1.7.1) by generation size using the ranges in Table 5. With that clarification now on the record, we ask that you please provide a response to the original question.

RESPONSE:

Table 5 of the Application uses dollar ranges; however, net generation (outflow) is in kWh.

The table below provides a monthly breakdown of 2018 net generation (outflow) using Generating Facility size ranges that were used in BC Hydro's response to BCUC IR 1.3.1.

Month	2018 Net Generation (Outflow) kWh by Generating Facility Size				
	≤ 5 kW	>5, ≤ 10 kW	>10, ≤ 25 kW	>25, ≤ 50 kW	>50 kW
January	7,960	12,994	15,810	16,818	109,804
February	23,148	38,820	29,376	22,630	95,846
March	69,636	118,911	73,832	39,528	108,951
April	99,643	168,213	94,801	53,853	114,675
May	192,770	326,745	185,895	82,417	177,367
June	148,951	265,441	158,714	111,350	174,866
July	200,686	372,458	220,712	142,099	192,148
August	153,089	294,496	181,494	103,090	183,410
September	107,949	211,600	129,742	74,293	152,583
October	78,842	160,220	97,297	71,622	92,544
November	25,177	52,149	40,310	53,457	112,594
December	11,006	24,313	21,988	41,617	101,514
Total	1,118,857	2,046,360	1,249,971	812,774	1,616,302

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28.0 Reference: Exhibit B-5, BCSEA 1.7.1 and BCSEA 1.8.1

2.28.1 What are the provisions in the SOP Purchase Agreements as to the term of the agreements?

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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28.0 Reference: Exhibit B-5, BCSEA 1.7.1 and BCSEA 1.8.1

2.28.2 What are the specific terms in the SOP Purchase Agreements regarding the termination of the agreements?

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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28.0 Reference: Exhibit B-5, BCSEA 1.7.1 and BCSEA 1.8.1

2.28.3 What are the specific terms in the SOP Purchase Agreements regarding the purchase price to be paid by BC Hydro?

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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29.0 Reference: Exhibit B-5, BCSEA 1.14.10

2.29.1 How many of the 1,851 participants (per Application, Tables 2 & 3) are located in NIAs?

RESPONSE:

Of the 1,851 participants in the Program, as provided in Tables 2 and 3 of the Application, 18 are located in Non-Integrated Areas (NIAs).

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29.0 Reference: Exhibit B-5, BCSEA 1.14.10

2.29.2 What portion of the \$324,358 in surplus energy payments in 2018 was to participants in NIAs?

RESPONSE:

0.5 per cent of Surplus Energy Payments in fiscal 2018 were made to customers in the Non-Integrated Areas (NIAs).

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30.0 Reference: Exhibit B-5, BCOAPO 1.9.1.2

2.30.1 How many of the current Net Metering participants with generation of 50 KW or less utilize a synchronous generator or take service at a Primary Voltage?

RESPONSE:

There are two customers that utilize a synchronous generator and 20 customers who take service at a Primary Voltage.

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30.0 Reference: Exhibit B-5, BCOAPO 1.9.1.2

2.30.1 How many of the current Net Metering participants with generation of 50 KW or less utilize a synchronous generator or take service at a Primary Voltage?

2.30.1.1 Were there “associated incremental costs” associated with connecting the generation of any of these customers such that they were required to pay for these costs? If yes, how many of these customers were required to make such payments?

RESPONSE:

There was one customer with a generating facility of 50 kW or less who utilized a synchronous generator or took service at a Primary Voltage who paid the associated incremental costs.

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30.0 Reference: Exhibit B-5, BCOAPO 1.9.1.2

2.30.2 How many of the 16 customer with generation greater than 50 kW (per Application, Table 3) were required to make pay for the incremental costs associated with connecting their generation?

RESPONSE:

Two customers with a Generating Facility greater than 50 kW, listed in Table 3 of the Application, were required to pay for the incremental interconnection costs associated with connecting their Generating Facility.

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31.0 Reference: Exhibit B-3, BCUC 1.15.6 and 1.15.6.1

2.31.1 Does BC Hydro agree that the electricity prices it charges (per its approved Tariffs) influence the capital investment decisions made by all of its customers?

RESPONSE:

BC Hydro expects that tariff rates for electricity are a consideration that would influence capital investment decisions by customers to reduce the amount of electricity they purchase from BC Hydro.

As stated in BC Hydro's response to BCCSC IR 1.6.26.2, as the Program is intended to be a load offset program, BC Hydro believes that the primary financial consideration for customers with regards to capital investments required to participate in the Program should be the value they expect to receive from the ability to offset their own consumption.

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31.0 Reference: Exhibit B-3, BCUC 1.15.6 and 1.15.6.1

2.31.1 Does BC Hydro agree that the electricity prices it charges (per its approved Tariffs) influence the capital investment decisions made by all of its customers?

2.31.1.1 If not, why not?

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.31.1.

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31.0 Reference: Exhibit B-3, BCUC 1.15.6 and 1.15.6.1

2.31.2 In previous applications by BC Hydro to change the rate design for particular customer classes, has consideration of customers' past capital investment decisions been factor in justifying the need for a "transition period"?

RESPONSE:

BC Hydro is unaware of any particular rate design applications where it has used customers' past capital investment decisions as a justification for a transition period. Typically transition periods are used to help mitigate customer bill impacts associated with rate design changes.

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31.0 Reference: Exhibit B-3, BCUC 1.15.6 and 1.15.6.1

2.31.2 In previous applications by BC Hydro to change the rate design for particular customer classes, has consideration of customers' past capital investment decisions been factor in justifying the need for a "transition period"?

2.31.2.1 If yes, please provide examples.

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.31.2.

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31.0 Reference: Exhibit B-3, BCUC 1.15.6 and 1.15.6.1

2.31.2 In previous applications by BC Hydro to change the rate design for particular customer classes, has consideration of customers' past capital investment decisions been factor in justifying the need for a "transition period"?

2.31.2.2 If yes, in the examples provided, did such considerations lead to i) a delay in the transition for existing customers (as proposed for Net Metering participants) or ii) a phase-in of the change in the rates over a transition period?

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 2.31.2.

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32.0 Reference: Exhibit B-5, BCCSC 1.6.5

The response states: “No portion of the Transmission system Return on Equity is specifically associated with electricity imports because electricity imports are of energy and the Transmission System Return on Equity is based on capacity”.

2.32.1 Please confirm that BC Hydro’s OATT and, in particular its Point to Point Transmission Rates, are derived from its Transmission Revenue Requirement which includes an allowance for return on equity.

RESPONSE:

The Point-To-Point Transmission Service rates that are included in OATT Rate Schedule 01 are derived from the Transmission Revenue Requirement, which includes the portion of return on equity that is functionalized to transmission based on rate base. These rates represent the maximum price for transmission reservations on BC Hydro’s system.

The Discount Rate shown on OATT Rate Schedule 01 may apply to Short-Term Point-To-Point Transmission Service including Firm and Non-Firm Service. The discounted Short-Term rates are not derived from BC Hydro’s Transmission Revenue Requirement. The current Short-Term rate design was approved by BCUC Order No. G-102-09 related to the British Columbia Transmission Corporation (BCTC) 2008 Application to Amend the OATT. The rationale for discounting the Short-Term Point-to-Point rates was to address a decline in Short-Term Point-to-Point transmission service revenues that BC Transmission Corporation had experienced with the previous rate design.

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32.0 Reference: Exhibit B-5, BCCSC 1.6.5

The response states: “No portion of the Transmission system Return on Equity is specifically associated with electricity imports because electricity imports are of energy and the Transmission System Return on Equity is based on capacity”.

2.32.1 Please confirm that BC Hydro’s OATT and, in particular its Point to Point Transmission Rates, are derived from its Transmission Revenue Requirement which includes an allowance for return on equity.

2.32.1.1 If not confirmed, please explain why?

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.32.1.

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32.0 Reference: Exhibit B-5, BCCSC 1.6.5

The response states: “No portion of the Transmission system Return on Equity is specifically associated with electricity imports because electricity imports are of energy and the Transmission System Return on Equity is based on capacity”.

2.32.2 Are electricity imports subject to BC Hydro’s Point to Point (either Short- Term or Long-Term) Transmission Rates?

RESPONSE:

The Point-To-Point Transmission Service (PTP) rates under the OATT represent the charges for transmission reservations on BC Hydro’s transmission system (i.e., capacity). The Transmission Customer that obtains the PTP has the right to schedule energy using the transmission reservation up to the amount of transmission reserved (megawatts), and length of the transmission reservation. The customer pays the full PTP charge regardless of whether or not or how much energy it schedules on the transmission reservation.

If a generator located outside of BC Hydro’s service area is selling electricity to a wholesale customer (e.g., an electric utility) in the BC Hydro service area, the applicable PTP rate (either Short-Term or Long-Term) would apply to the transmission reservations on the BC Hydro system that are required to schedule that transaction.

Where Network Economy Service transmission reservations are used to import electricity, BC Hydro has the right to transmit energy to serve network load, on an as-available basis, at no additional charge. The Network Integration Transmission Service (NITS) charge is ultimately recovered from BC Hydro’s domestic ratepayers.

However, BC Hydro, as Network Customer, can use non-designated resources, including those located outside of its service area, to supply its Network Load using Secondary Service under section 28.4 of the OATT, as modified by the Network Economy Service provisions of Attachment Q-2 and Tariff Supplement 80. BC Hydro, as Network Customer, pays the NITS charge under OATT (Attachment H and Rate Schedule 00) and, as a result, can use this service on an as-available basis, at no additional charge to the NITS charge that BC Hydro pays as Network Customer.

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32.0 Reference: Exhibit B-5, BCCSC 1.6.5

The response states: “No portion of the Transmission system Return on Equity is specifically associated with electricity imports because electricity imports are of energy and the Transmission System Return on Equity is based on capacity”.

2.32.2 Are electricity imports subject to BC Hydro’s Point to Point (either Short- Term or Long-Term) Transmission Rates?

2.32.2.1 If no, why not?

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.32.2.

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32.0 Reference: Exhibit B-5, BCCSC 1.6.5

The response states: “No portion of the Transmission system Return on Equity is specifically associated with electricity imports because electricity imports are of energy and the Transmission System Return on Equity is based on capacity”.

2.32.2 Are electricity imports subject to BC Hydro’s Point to Point (either Short- Term or Long-Term) Transmission Rates?

2.32.2.2 If yes, who pays the tariff?

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.32.2.

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33.0 Reference: Exhibit B-5, BCCSC 1.6.25

The response states: “BC Hydro is proposing that the transitional Energy Price apply to all customers with accepted applications as of April 20, 2018. This would include customers who expanded their Generating Facility after April 20, 2018, provided that the expansion met the eligibility requirements of the Program”.

2.33.1 Please confirm that a customer who is already receiving service under RS 1289 but plans to expand its generating capacity must file a “new” Net Metering Application in order to receive service under RS 1289 for the expanded generation capability.

RESPONSE:

Confirmed.

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33.0 Reference: Exhibit B-5, BCCSC 1.6.25

The response states: “BC Hydro is proposing that the transitional Energy Price apply to all customers with accepted applications as of April 20, 2018. This would include customers who expanded their Generating Facility after April 20, 2018, provided that the expansion met the eligibility requirements of the Program”.

2.33.1 Please confirm that a customer who is already receiving service under RS 1289 but plans to expand its generating capacity must file a “new” Net Metering Application in order to receive service under RS 1289 for the expanded generation capability.

2.33.1.1 If not confirmed, please explain why, given the definition in the Appendix B of a “Net Metering Application”.

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.33.1

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33.0 Reference: Exhibit B-5, BCCSC 1.6.25

The response states: “BC Hydro is proposing that the transitional Energy Price apply to all customers with accepted applications as of April 20, 2018. This would include customers who expanded their Generating Facility after April 20, 2018, provided that the expansion met the eligibility requirements of the Program”.

2.33.2 With regard to the response to BCCSC 1.6.25, please clarify whether an existing RS 1289 customer (as of April 20, 2018) who subsequently plans to expand their generation capacity and submits a Net Metering Application in that regard after April 20, 2018 will be eligible for the transitional Energy Price.

RESPONSE:

Customers with an original application, accepted as of April 20, 2018, who subsequently apply to expand their existing Generating Facilities, during the transitional Energy Price period, would be eligible for the transitional Energy Price, provided that the expansion(s) meets the eligibility requirements of the Program, including the requirement that the estimated Annual Energy Output not exceed the estimated Annual Load.

In BC Hydro’s view, the requirement that the estimated Annual Energy Output not exceed the estimated Annual Load means that allowing these customers to be eligible for the transitional Energy Price should have a minimal impact on total Surplus Energy Payments during the transitional period.

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33.0 Reference: Exhibit B-5, BCCSC 1.6.25

The response states: “BC Hydro is proposing that the transitional Energy Price apply to all customers with accepted applications as of April 20, 2018. This would include customers who expanded their Generating Facility after April 20, 2018, provided that the expansion met the eligibility requirements of the Program”.

2.33.2 With regard to the response to BCCSC 1.6.25, please clarify whether an existing RS 1289 customer (as of April 20, 2018) who subsequently plans to expand their generation capacity and submits a Net Metering Application in that regard after April 20, 2018 will be eligible for the transitional Energy Price.

2.33.2.1 If the answer is yes, does this eligibility apply to any subsequent Application received over the five year transition period?

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.33.2.

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33.0 Reference: Exhibit B-5, BCCSC 1.6.25

The response states: “BC Hydro is proposing that the transitional Energy Price apply to all customers with accepted applications as of April 20, 2018. This would include customers who expanded their Generating Facility after April 20, 2018, provided that the expansion met the eligibility requirements of the Program”.

2.33.2 With regard to the response to BCCSC 1.6.25, please clarify whether an existing RS 1289 customer (as of April 20, 2018) who subsequently plans to expand their generation capacity and submits a Net Metering Application in that regard after April 20, 2018 will be eligible for the transitional Energy Price.

2.33.2.2 If the answer is yes, please explain why this is appropriate.

RESPONSE:

Please refer to BC Hydro’s response to BCOAPO IR 2.33.2.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.1 Is that an accurate description of BC Hydro's reasons for its proposed ban on new intentional oversized generation?

RESPONSE:

As described in section 2.2 of the Application, the proposed amendments with regards to Oversized Generating Facilities are intended to align the Program with its original intent of being a load offset program that limits cost shifting to non-participants.

The misalignment of the Energy Price with the value of excess generation from customers in the Program to BC Hydro contributes to cost-shifting to non-participants.

Allowing Oversized Generating Facilities results in the Program being more akin to an energy procurement program rather than a load offset program. As BC Hydro has suspended the Standing Offer Program, it is not appropriate for the Program to essentially become a replacement energy procurement program by allowing Program customers to intentionally install Oversized Generating Facilities.

Please also refer to BC Hydro's response to BCUC IR 1.10.2 where we explain why it is appropriate to value excess generation from customers in the Program based on the market value.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
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In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.2 If BC Hydro has any additional reasons for the proposed ban on intentional oversized generation please state them.

RESPONSE:

Please refer to BC Hydro's response to BCSEA IR 2.23.1.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

1.23.3 Would BC Hydro agree that while it says in the Application and in some of the IR responses that its proposed Mid-C market-based Energy Price would reflect the value of Surplus Energy to BC Hydro, BC Hydro's more nuanced position is that its proposed Energy Price would only reduce, but not eliminate, cost-shifting regarding Surplus Energy Payments?

RESPONSE:

BC Hydro's proposed amendments to the Energy Price are intended to mitigate the cost-shifting associated with Surplus Energy Payments, but may not eliminate such cost shifting. As discussed in BC Hydro's response to BCUC IR 1.12.4, the market price is a reasonable approximation of the value of excess generation from customers in the Program to BC Hydro.

The value of the specific net generation (outflow) received by BC Hydro will vary depending on various factors (e.g., time of delivery, location of the customer, etc.). Simplicity is one of the key principles for the design of the Program. Developing an Energy Price that incorporates these elements would add considerable complexity and would not be consistent with this principle.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.4 Would BC Hydro agree that in principle the proposed methodology for establishing the Energy Price could be adjusted so that it fully reflects the value of Surplus Energy to BC Hydro?

RESPONSE:

While BC Hydro agrees that an Energy Price that includes adjustments for line losses and wheeling charges would better reflect the value to BC Hydro of excess energy from customers in the Program, it would not fully reflect the value of that energy to BC Hydro.

As discussed in BC Hydro's response to BCUC IR 1.12.4, BC Hydro cannot determine the exact times within a given year that a customer's net generation (outflow) contributed towards their excess generation. Therefore, it is not possible to determine the exact value of the specific net generation (outflow) received by BC Hydro. As shown in BC Hydro's response to BCUC IR 1.12.4, an Energy Price based on the annual average Mid-C for the most recent calendar year provides a reasonable approximation of the value of the energy received by BC Hydro.

As discussed in section 4.7 of the Application, to maintain a simple approach and to recognize the BCUC's previous determination that limited cost-shifting is warranted to support the implementation of net metering, BC Hydro does not believe that Energy Price should be adjusted to account for line losses and wheeling charges.

As discussed further in BC Hydro's response to BCUC IR 2.26.2, the proposed update to the Energy Price is only intended to mitigate the cost shifting associated with Surplus Energy Payments. The remaining cost shifting resulting from the Program is not being mitigated through the Application.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.5 Please identify any factors in addition to energy delivery costs that are not included in BC Hydro's proposed market-based Energy Price and that would cause the Energy Price not to fully reflect the value of Surplus Energy to BC Hydro.

RESPONSE:

In BC Hydro's view, besides line losses and wheeling charges, there are no other factors that could be potential adjustments to the Energy Price at this time.

As discussed in section 7.3 of the Application, over time, as participation in the Program increases, BC Hydro may be able to recognize certain additional benefits from the Program. For example, Austin Energy has a "value of solar" tariff that recognizes benefits such as loss savings, energy savings, generation capacity savings, fuel price hedge value, transmission and distribution capacity savings and environmental benefits.

As discussed in BC Hydro's response to BCSEA IR 2.23.4, while an Energy Price that includes adjustments for line losses and wheeling charges would better reflect the value to BC Hydro of excess energy from customers in the Program, it would not fully reflect the value of that energy.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.6 Please provide an appropriate methodology for determining an Energy Price that reflects the actual full value of Surplus Energy to BC Hydro such that Surplus Energy Payments would not involve any cost-shifting between participating and non-participating customers. Exclude any cost-shifting associated with costs of meeting demand or costs of providing energy.

RESPONSE:

As discussed in BC Hydro's response to BCSEA IR 2.23.4, while an Energy Price that includes adjustments for line losses and wheeling charges would better reflect the value of Surplus Energy to BC Hydro, it would not fully reflect the value of that Surplus Energy to BC Hydro.

The appropriate methodology for determining an Energy Price with adjustments for line losses and wheeling charges is:

(Annual Average Mid-C Price/MWh - (Annual Average Mid-C Price/MWh X 0.019) - (\$5.16/MWh)) * Exchange Rate

For further information on the values used in this calculation, please refer to BC Hydro's response to CEC IR 1.15.4.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.7 Please provide an example of an Energy Price determined by this methodology using the most recent year for which data is available or reasonable forecasted estimates.

RESPONSE:

As shown in BC Hydro's response to BCSEA IR 2.23.6, the methodology to include adjustments for line losses and wheeling charges is:

(Annual Average Mid-C Price/MWh - (Annual Average Mid-C Price/MWh X 0.019) - (\$5.16/MWh)) * Exchange Rate

Using values for calendar year 2018, the calculation would be:

(\$30.76/MWh - (\$30.76/MWh * 0.019) - (\$5.16/MWh)) * 1.2957 = \$32.41/MWh

Divide by 1,000 to convert to kWh: 3.24 cents per kWh

For further information on the values used in this calculation, please refer to BC Hydro's response to CEC IR 1.15.4.

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23.0 Topic: Rationale for Ban on New Intentional Oversized Generation

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

In the first round of information requests, BCSEA asked whether, in the event the Commission approves a new Energy Price based on the value of annual net excess generation to BC Hydro, there needs to be a ban on new intentional oversized generation. The questions assumed that the 100 kW maximum generator size and the Interconnection Approval requirement remain in place. BCSEA understands BC Hydro's response to be that new intentional oversized generation should be banned for two reasons. First, BC Hydro's requested update to the Energy Price does not actually reflect the full value to BC Hydro of annual Surplus Energy because it doesn't include BC Hydro's export energy delivery costs. Second, even if the Energy Price reflected the full value to BC Hydro, a ban on new intentional oversized generation is necessary to meet BC Hydro's Objective 1 to maintain Net Metering as a load offset program.

2.23.8 For clarity, please compare the size of the Energy Price for a given year determined by (a) BC Hydro's proposed methodology and (b) a methodology that yields an Energy Price reflecting the full value of Annual Surplus Energy to BC Hydro.

RESPONSE:

Using the values provided in BC Hydro's response to BCSEA IR 2.23.7, the Energy Price using BC Hydro's proposed methodology is 3.99 cents per kWh (as provided in section 4.7 of the Application) and the Energy Price with adjustments for line losses and wheeling charges is 3.24 cents per kWh.

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24.0 Topic: Energy Price, Costs of Delivery to Mid-C Market

Reference: BC Hydro, Freshet Rate Pilot Final Evaluation Report, December 2018

BC Hydro's Freshet Rate Pilot, Rate Schedule 1892, includes a CAD\$3.00/MWh proxy for BC Hydro's costs of delivering energy to the market in order to protect non-participating ratepayers from risk. The objectives of the rate are described in BC Hydro's Freshet Rate Pilot Final Evaluation Report, December 2018, as follows:

"1.1 Pilot Objectives

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

- Increase the ability to import market electricity during low-priced periods;
- Reduce the volume of surplus energy forced to export markets; and/or
- Reduce spill risk at BC Hydro facilities.

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

In the same report, BC Hydro explains the wheeling charges in the Freshet Rate as follows:

"3.1.2 Wheeling Charges

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

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

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

- 2.24.1 In BC Hydro's view, is the "wheeling charge" in the Freshet Rate a suitable model for incorporating the costs of delivering energy to the market in the Energy Price in the Net Metering Program? If so, why? If not, why not?

RESPONSE:

No, the Freshet Rate (Rate Schedule 1892) wheeling charge would not be a suitable model for incorporating the costs of delivering energy to the market, under the Program, for the following reasons:

- **The wheeling charge under Rate Schedule 1892 is intended to act as a cost-recovery mechanism for margin and risk related to the provision of incremental energy under the Freshet Rate. It is a notional reference price only. There is no physical wheeling of energy to or from the Mid-C market associated with Freshet Rate service. In its forthcoming application to make the Freshet Rate permanent, BC Hydro intends to replace the term "wheeling rate" with "energy change adder" to make this clear; and**
- **In contrast, net generation (outflow) from customers in the Program is physically delivered to the BC Hydro system. BC Hydro takes receipt of that energy at the Point of Interconnection. In order to realize the export value of the energy at Mid-C, BC Hydro must wheel the energy through the BC Hydro**

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system to the BC border and then from the BC border to the Mid-C market. For the wheel from the BC border to the Mid-C market, the physical energy transaction is subject to Bonneville Power Administration's Open Access Transmission Tariff. The wheeling rate for this non-firm point-to-point transmission service is US\$5.16/MWh, plus a 1.9 per cent energy loss adjustment.

As discussed in section 4.7 of the Application, to maintain a simple approach and to recognize the BCUC's previous determination that limited cost-shifting is warranted to support the implementation of net metering, BC Hydro is not proposing any adjustments to the average annual Mid-C market price beyond the conversion from US to Canadian currency.

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24.0 Topic: Energy Price, Costs of Delivery to Mid-C Market

Reference: BC Hydro, Freshet Rate Pilot Final Evaluation Report, December 2018

BC Hydro's Freshet Rate Pilot, Rate Schedule 1892, includes a CAD\$3.00/MWh proxy for BC Hydro's costs of delivering energy to the market in order to protect non-participating ratepayers from risk. The objectives of the rate are described in BC Hydro's Freshet Rate Pilot Final Evaluation Report, December 2018, as follows:

"1.1 Pilot Objectives

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

- Increase the ability to import market electricity during low-priced periods;
- Reduce the volume of surplus energy forced to export markets; and/or
- Reduce spill risk at BC Hydro facilities.

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

In the same report, BC Hydro explains the wheeling charges in the Freshet Rate as follows:

"3.1.2 Wheeling Charges

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

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

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

- 2.24.2 Please confirm, or otherwise explain, that the quotes in the preamble from the Freshet Rate Pilot Final Evaluation Report, December 2018, are accurate.

RESPONSE:

Confirmed.

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25.0 Topic: Purpose of Net Metering Program

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
 Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

BC Hydro maintains that one rationale for the proposed ban on intentional oversized generation is that the Net Metering Program was intended to be, and was approved as, a load offset program. The following questions are aimed at what should be the purpose of the Net Metering Program going forward, as distinct from what was the purpose of the Program in the past.

2.25.1 Assuming for the sake of discussion that (a) the Net Metering Program is at the present a load offset program, (b) all cost-shifting factors except those related to Surplus Energy Payments are not being addressed in the current proceeding, (c) the Commission approves an Energy Price that reflects the full value of Surplus Energy to BC Hydro, and (d) all the maximum generator size and system impact constraints remain in place, please state all the reasons why BC Hydro says the Net Metering Program should not be changed so that its purpose is no longer limited to load offset and instead includes intentional sales of Annual Surplus Energy to BC Hydro priced at the full value to BC Hydro.

RESPONSE:

BC Hydro is unable to respond to the question as it requires BC Hydro to make four separate assumptions that may or may not be true in practice. BC Hydro's rationale for the amendments with regards to Oversized Generating Facilities is set out in BC Hydro's response to BCSEA IR 2.23.1.

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25.0 Topic: Purpose of Net Metering Program

**Reference: Exhibit B-5, BC Hydro Response to BCSEA IR 1.1.2;
Exhibit B-3, BC Hydro Response to BCUC 1.5.3**

BC Hydro maintains that one rationale for the proposed ban on intentional oversized generation is that the Net Metering Program was intended to be, and was approved as, a load offset program. The following questions are aimed at what should be the purpose of the Net Metering Program going forward, as distinct from what was the purpose of the Program in the past.

2.25.2 Would BC Hydro agree that there is strong interest among certain BC Hydro customers in a net metering program in which they would be allowed to intentionally size their generation facility to create annual Surplus Energy for sale to BC Hydro at an Energy Price that reflects the full value to BC Hydro and hence to other ratepayers?

RESPONSE:

As illustrated in Figure 3 on page 20 of the Application, 34 per cent of participants preferred no load-to-generation ratio. Accordingly, it is reasonable to assume that there is interest among some customers in the Program to intentionally size their Generating Facility to create excess energy for sale to BC Hydro.

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26.0 Topic: Cost-shifting

Reference: Exhibit B-3, BC Hydro Response to BCUC 1.5.1; Exhibit B-5, BC Hydro Response to BCSEA 1.1.2

BCUC IR 1.5.1 asked BC Hydro to elaborate on how cost-shifting from NM customers to other non-participants occurs based on BC Hydro’s rate design and cost of service for each of the customer classes eligible for the NM program. BC Hydro’s response begins with the following two statements:

“Cost-shifting occurs when BC Hydro’s cost of service is not fully recovered from customers in the Program, which results in non-participating customers bearing any unrecovered costs.

The amendments proposed in the Application are intended to address cost-shifting that occurs between participating and non-participating customers with regards to Surplus Energy Payments.”

After explaining its view of how Surplus Energy Payments currently involve cost-shifting, BC Hydro describes two additional types of (putative) cost-shifting that are not addressed through the proposed amendments in the Application:

“Net Metering Customers Still Require Energy on Demand..., and

Net Metering Customers Accumulate a Generation Account Balance to Reduce Subsequent Bill(s)...”

BC Hydro maintains that even if the Energy Price reflected the full value of Surplus Energy to BC Hydro the proposed ban on intentional Oversized Generation would be justified by Objective 1 to maintain the program as a load offset program.

2.26.1 Does BC Hydro accept that (putative) Energy Demand cost-shifting and Generation Account Balance cost-shifting are not reasons for maintaining Net Metering as a load offset program?

RESPONSE:

BC Hydro’s rationale for the amendments with regards to Oversized Generating Facilities is set out in BC Hydro’s response to BCSEA IR 2.23.1.

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26.0 Topic: Cost-shifting

Reference: Exhibit B-3, BC Hydro Response to BCUC 1.5.1; Exhibit B-5, BC Hydro Response to BCSEA 1.1.2

BCUC IR 1.5.1 asked BC Hydro to elaborate on how cost-shifting from NM customers to other non-participants occurs based on BC Hydro’s rate design and cost of service for each of the customer classes eligible for the NM program. BC Hydro’s response begins with the following two statements:

“Cost-shifting occurs when BC Hydro’s cost of service is not fully recovered from customers in the Program, which results in non-participating customers bearing any unrecovered costs.

The amendments proposed in the Application are intended to address cost-shifting that occurs between participating and non-participating customers with regards to Surplus Energy Payments.”

After explaining its view of how Surplus Energy Payments currently involve cost-shifting, BC Hydro describes two additional types of (putative) cost-shifting that are not addressed through the proposed amendments in the Application:

“Net Metering Customers Still Require Energy on Demand..., and

Net Metering Customers Accumulate a Generation Account Balance to Reduce Subsequent Bill(s)...”

BC Hydro maintains that even if the Energy Price reflected the full value of Surplus Energy to BC Hydro the proposed ban on intentional Oversized Generation would be justified by Objective 1 to maintain the program as a load offset program.

2.26.2 Does BC Hydro accept that (putative) Energy Demand cost-shifting and Generation Account Balance cost-shifting are not reasons for the proposed ban on Oversized Generation?

RESPONSE:

BC Hydro’s rationale for the amendments with regards to Oversized Generating Facilities is set out in BC Hydro’s response to BCSEA IR 2.23.1.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
B	Demand-related Costs	12.82 (\$/kW/month) * 36,366 kW / month provided by BC Hydro	\$466,212
C	Customer-related Costs	140 (\$/year/account) * 409 accounts	\$57,230
D	Program Administration Costs	175 (\$ / year / account) * 409 accounts	\$71,575
E	Total Costs to Serve	E = A + B + C + D	<u>\$782,905</u>
BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
H	Total Revenues and Value Received	H = F + G	\$524,472

Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

- 2.24.1 The BC Hydro Total Costs to serve for the program are \$782,905 and the total revenues and values received are \$524,572. Can the total costs borne by non-participating customers for the program in fiscal 2016 be calculated as the difference, of approximately \$258,433?

RESPONSE:

As described in BC Hydro's response to BCUC IR 2.26.3, the results of Table 8 in BC Hydro's response to BCUC IR 1.5.2 provide an estimate of average cost shifting per Residential (Rate Schedule 1101) customer in the Program in fiscal 2016, based on the analysis of 409 accounts.

In order to estimate the total cost shifting for Residential (Rate Schedule 1101) customers in the Program in fiscal 2016, the average cost shifting per account in fiscal 2016 should be multiplied by the total number of Rate Schedule 1101 customers in the Program in fiscal 2016 as follows:

Total estimated cost shifting for Residential (Rate Schedule 1101) Program customers in fiscal 2016 = \$456/year per account X 640 Rate Schedule 1101 customers in the Program in fiscal 2016 = \$291,840.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
B	Demand-related Costs	12.82 (\$/kW/month) * 36,366 kW / month provided by BC Hydro	\$466,212
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E	Total Costs to Serve	E = A + B + C + D	<u>\$782,905</u>
BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
H	Total Revenues and Value Received	H = F + G	\$524,472

Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

2.24.1 The BC Hydro Total Costs to serve for the program are \$782,905 and the total revenues and values received are \$524,572. Can the total costs borne by non-participating customers for the program in fiscal 2016 be calculated as the difference, of approximately \$258,433?

2.24.1.1 If not, please explain why not and provide the correct calculation.

RESPONSE:

Please refer to BC Hydro's response to CEC IR 2.24.1.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
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BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
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Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

2.24.1 The BC Hydro Total Costs to serve for the program are \$782,905 and the total revenues and values received are \$524,572. Can the total costs borne by non-participating customers for the program in fiscal 2016 be calculated as the difference, of approximately \$258,433?

2.24.1.2 If yes is it expected that this figure would be continued, and expanding every year as the program increases? Please comment.

RESPONSE:

The actual average cost shifting per customer in the Program, as set out in BC Hydro's response to BCUC IR 1.5.2, is for customers in the Program served under Rate Schedule 1101 in fiscal 2016.

Cost shifting associated with customers in the Program served under Rate Schedule 1101 is expected to increase as the number of customers in the Program served under Rate Schedule 1101 increases.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
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E	Total Costs to Serve	E = A + B + C + D	<u>\$782,905</u>
BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
H	Total Revenues and Value Received	H = F + G	\$524,472

Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

2.24.2 BC Hydro was unable to provide the 'Actual Average cost shifting analysis' for customers served on other rate schedules. Is it fair to expect that the other rate schedules would produce similar results? Please explain and discuss whether the values would likely be similar.

RESPONSE:

Generally, BC Hydro would expect cost shifting to be greatest for customers in the Program with solar photovoltaic generation that take service under Rate Schedule 1101 (Residential Service) and RS13XX (Small General Service). This is primarily because:

- Solar photovoltaic generation is not coincident with BC Hydro's system peak, which means there are no resulting demand-related cost savings; and
- Under both Rate Schedule 1101 and Rate Schedule 13XX, BC Hydro recovers demand related costs through Energy Charges and customers in the Program can avoid paying the Energy Charges under their applicable rate

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schedule by accumulating a Generation Account Balance to offset their net consumption purchased from BC Hydro.

BC Hydro expects that cost shifting would be lower for customers in the Program that take service under a rate schedule with a Demand Charge (e.g., Rate Schedule 16XX - Large General Service) and for customers in the Program with generation that is coincident with BC Hydro's system peak (e.g., biomass).

For further discussion, please refer to BC Hydro's response to BCUC IR 2.26.4.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
B	Demand-related Costs	12.82 (\$/kW/month) * 36,366 kW / month provided by BC Hydro	\$466,212
C	Customer-related Costs	140 (\$/year/account) * 409 accounts	\$57,230
D	Program Administration Costs	175 (\$ / year / account) * 409 accounts	\$71,575
E	Total Costs to Serve	E = A + B + C + D	<u>\$782,905</u>
BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
H	Total Revenues and Value Received	H = F + G	\$524,472

Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

2.24.3 Please provide the revenue to cost ratios for other rate classes.

RESPONSE:

The following table provides BC Hydro's Fiscal 2017 Revenue to Cost Ratios for its rate classes. BC Hydro has not calculated the Revenue to Cost ratios for customers in the Program other than those that took service under Rate Schedule 1101 in fiscal 2016 (see BC Hydro's response to BCUC IR 1.5.2). Rate Schedule 1101 customers are part of the Residential Rate Class, along with customers on other residential service rate schedules such as Rate Schedule 1107 (Residential Service - Zone II).

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Rate Class	Revenue to Cost Ratios				
	F2014 Actual (%)	F2016 Forecast (%)	F2016 Actual (%)	F2017 Actual (%)	Percentage Point Change (F2016 Actual to F2017 Actual) (%)
Residential	92.9	93.3	90.8	93.2	2.4
GS < 35 kW	123.5	111.9	122.6	123.6	1.0
MGS	119.5	117.2	123.5	115.1	-8.4
LGS	101.5	101.3	103.9	103.9	0.0
Irrigation	90.3	87.6	95.1	89.5	-5.6
Street Lighting – BC Hydro Owned	129.4	173.6	183.6	198.4	14.8
Street Lighting – Customer Owned		104.8	101.8	95.1	-6.7
Transmission	97.3	102.6	98.8	95.4	-3.4
Total	100.0	100.0	100.0	100.0	100.0

Source: <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/reports/2019-02-14-facos-f2017-ff.pdf>

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
B	Demand-related Costs	12.82 (\$/kW/month) * 36,366 kW / month provided by BC Hydro	\$466,212
C	Customer-related Costs	140 (\$/year/account) * 409 accounts	\$57,230
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E	Total Costs to Serve	E = A + B + C + D	<u>\$782,905</u>
BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
H	Total Revenues and Value Received	H = F + G	\$524,472

Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

- 2.24.4 Is it fair to state that commercial customers non-participating in the net metering program will likely be significantly subsidizing commercial customers participating in the net metering programs?

RESPONSE:

BC Hydro's analysis of costs of service for customers in the Program taking service under Rate Schedule 1101 (Residential Service) in fiscal 2016 shows that there is cost-shifting from customers in the Program that take service under Rate Schedule 1101 to non-participating customers, including commercial customers. For further information on this analysis, please refer to BC Hydro's response to BCUC IR 1.5.2.

While BC Hydro has not analyzed the extent of cost shifting associated with customers in the Program aside from those taking service under Rate Schedule 1101 in fiscal 2016, it is reasonable to expect that there is cost shifting from all customers in the Program in BC Hydro's integrated areas to non-participating customers to some extent because:

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- all of the rate schedules under which customers in the Program take service rely to a varying extent on Energy Charges to recover Demand related costs of service;
- under the terms of Rate Schedule 1289, customers in the Program can avoid paying Energy Charges; and
- the predominant type of generation for customers in the Program is solar photovoltaic which does not result in Demand related cost savings.

As BC Hydro's costs of service substantially differ in the non-integrated areas compared to the integrated areas, further work is required to understand whether cost shifting from customers in the Program to non-participants is occurring in the non-integrated areas.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
B	Demand-related Costs	12.82 (\$/kW/month) * 36,366 kW / month provided by BC Hydro	\$466,212
C	Customer-related Costs	140 (\$/year/account) * 409 accounts	\$57,230
D	Program Administration Costs	175 (\$ / year / account) * 409 accounts	\$71,575
E	Total Costs to Serve	E = A + B + C + D	<u>\$782,905</u>
BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
H	Total Revenues and Value Received	H = F + G	\$524,472

Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
J	Average Residential Non Net Metering Customer Revenue to Cost Ratio	Per BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study	91%
K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

2.24.5 Is it fair to state that commercial customers not participating in the net metering program are also significantly subsidizing residential ratepayers who are participating in the program and have a R:C of 68%. Please explain why or why not.

RESPONSE:

Please refer to BC Hydro's response to CEC IR 2.24.4.

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24.0 Reference: Exhibit B-5, CEC 1.1.1 and Exhibit B-3, BCUC 1.5.2 and BCUC 1.5.2.1

1.1.1 Does BC Hydro believe that cost-shifting has occurred? Please explain and, if so, quantify.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.1 where we discuss how cost shifting between customers in the Program and non-participating customers occurs and to BC Hydro's response to BCUC IR 1.5.2 where we provide a cost-shifting analysis.

The proposed update to the Energy Price is intended to only address the cost-shifting with regards to Surplus Energy Payments.

Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
A	Energy-related Costs	0.031 (\$/kWh) * 6,041,355 kWh provided by BC Hydro	\$187,866
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BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
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I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
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K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

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RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide:

- Illustrative bills for each scenario referenced in the question for a hypothetical Residential RS 1101 customer using average fiscal 2018 energy usage for RS 1101 customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Illustrative bills for each scenario referenced in the question for a hypothetical Small General Service RS 13xx customer based on average fiscal 2018 energy sales to Small General Service customers and fiscal 2020 interim approved rates, on a bi-monthly billing cycle;
- Actual average cost-shifting analysis in fiscal 2016 for 409 residential customers in the Program served under RS 1101; and
- Cost-shifting results for the hypothetical RS 1101 customer scenarios referenced in the question.

BC Hydro is unable to provide this analysis for customers served on other rate schedules within the time allowed for responses to Round 1 information requests, given the resources required to conduct this analysis.

2.24.5 Is it fair to state that commercial customers not participating in the net metering program are also significantly subsidizing residential ratepayers who are participating in the program and have a R:C of 68%. Please explain why or why not.

2.24.5.1 If yes, please confirm, or otherwise explain, that commercial ratepayers that are not net metering customers can be considered to be cross-subsidizing all net metering customers who are participating, regardless of rate class.

RESPONSE:

Please refer to BC Hydro's response to CEC IR 2.24.4.

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25.0 Reference: Exhibit B-5, CEC 1. 7.3 and Exhibit B-3, BCUC 1.5.2.1

1.7.3 Please provide the total rate impact on non-participating ratepayers of the surplus energy payments over the last five years.

RESPONSE:

The cost-shifting from customers in the Program to non-participants caused by Surplus Energy Payments can be quantified by the difference between the total Surplus Energy Payments provided and the value of the excess generation received by BC Hydro for those payments. This is shown in the table below, along with the corresponding rate impact, for fiscal 2015 to fiscal 2019.

Fiscal Year	Surplus Energy Payments (\$)	Total Electricity Purchased Through Surplus Energy Payments (kWh)	Value of Energy Received ¹ (\$)	Difference Between Payments and Value Received (\$)	Rate Impact
2015	167,947	1,651,148	66,046	101,901	0.003
2016	171,999	1,721,713	55,095	116,904	0.003
2017	261,830	2,620,920	73,386	188,444	0.004
2018	324,358	3,246,827	94,158	230,200	0.005
2019	367,779	3,681,154	146,878	220,901	0.005

In responding to this question, BC Hydro noticed an error with regards to BC Hydro's response to BCUC IR 1.9.3. This response quantified the cost-shifting from customers in the Program to non-participants caused by Surplus Energy Payments using the Total Electricity Purchased Through Surplus Energy Payments figure, adjusted to account for the estimated impact of BC Hydro's proposed amendments with regards to the Anniversary Date. The calculation should have used the unadjusted figure.

As shown in the table above, total Surplus Energy Payments in fiscal 2018 were \$324,358 and the value of that energy to BC Hydro was approximately \$94,158. This equates to difference of \$230,200.

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Table 8 Actual Average Cost Shifting Per Residential (RS 1101) Net Metering Customer in Fiscal 2016

BC Hydro Cost of Service			
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BC Hydro Revenues and Avoided Costs			
F	BC Hydro Revenues Received	Electricity Bill Revenues less Surplus Energy Payments	\$474,342
G	Value to BC Hydro of Net Metering Generation Delivered	0.031 (\$/kWh) * 1,612,480 kWh Delivered to BC Hydro	\$50,148
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Cost Shifting			
I	Average Residential Net Metering Revenues to Cost Ratio	I = H / E	68%
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K	Actual Average Cost-shifting Per Account	J = E * (J - I) / 409 accounts	\$456 / year

2.25.1 In CEC 1.7.3, BC Hydro provides the cost shifting from non-participants caused by surplus energy payments as the difference between payments and value received for fiscal 2016 as \$116,904. In Table 8, BC Hydro provides actual average cost shifting total costs to serve of \$782,905 and total revenue and value received of \$524,472 for the residential sector only, which has a difference of approximately \$258,000. Please explain and provide any calculations to rationalize the residential figures with those for the program as a whole.

RESPONSE:

The calculation of actual average cost shifting per residential (Rate Schedule 1101) account in the Program includes cost shifting resulting from Surplus Energy Payments. For a breakdown, please refer to BC Hydro's response to BCUC IR 2.26.2.

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26.0 Reference: Exhibit B-5, CEC 1.7.4

Schedule (RS) 1289

Amount Range (\$)	Number of Customers	% of Overall Participants	Total Amount in Range (\$)	% of Total Surplus Energy Payments	Average Surplus Energy Payment to Total Bill Charges without Surplus (%)
0	1,079	81.25	0	0	0
≤ 100	96	7.23	4,141	1	2
>100, < 500	113	8.51	28,251	9	130
≥ 500, ≤ 1,000	20	1.51	12,742	4	515
> 1,000, ≤ 6,000	15	1.13	35,652	11	1927
28,000 – 74,000	5	0.38	243,573	75	60029
Total	1,328	100	324,358	100	

2.26.1 Please confirm the table is for fiscal 2018.

RESPONSE:

Confirmed.

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27.0 Reference: Exhibit B-5, CEC 1.7.5 and CEC 1.9.1

1.7.5 For each of the 5 customers who received surplus energy payments ranging from \$28,000 to \$74,000 in 2018, please:

- a) provide their historical annual billing and surplus energy payments for the last five years;
- b) identify the generation type; and
- c) identify their rate class.

Customers may be identified by number or letter to maintain confidentiality.

RESPONSE:

All five customers who received Surplus Energy Payment between \$28,000 and \$74,000 in fiscal 2018 have a hydroelectric Generating Facility. The table below provides the rate schedule and billing information for fiscal 2015 to fiscal 2019.

Cust. ID	Rate	Size (kW)	F2015		F2016		F2017		F2018		F2019	
			Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)
1	1101	100	60	44,691	64	46,117	67	58,541	69	73,008	71	72,066
2	1300	100					85	60,156	116	59,095	124	58,130
3	1101	50	60	41,263	64	41,880	68	41,221	69	41,994	71	41,910
4	1101	100	57	3,483	64	4,088	68	10,214	69	40,711	71	50,150
5	1300	50	75	30,390	82	32,837	86	32,428	119	28,764	124	26,937

1.9.1 Does 110% represent an increase from the original of 100%? If so, why did BC Hydro believe it is necessary to increase the

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RESPONSE:

Currently, a customer's estimated Annual Load must be equal to or greater than the estimated Annual Energy Output of their Generating Facility (i.e., estimated Annual Energy Output cannot be greater than 100 per cent of estimated Annual Load).

As discussed in section 2.3 of the Application, through comments received from customers and stakeholders since the 2018 Amendment Application, BC Hydro became aware of the need to provide increased flexibility with regards to the size of a Customer's Generating Facility.

Accordingly, as discussed in section 2.7 of the Application, BC Hydro has proposed adjustments to provide additional flexibility to customers. This includes the proposal that customers (with a Generating Facility greater than 5 kW) be allowed to size their Generating Facility to have an estimated Annual Energy Output up to 110 per cent of their estimated Annual Load. As discussed in section 2.6 of the Application, this is similar to the approach taken by Newfoundland Power, Nova Scotia Power and Xcel Energy.

BC Hydro believes that this proposal, in combination with the other amendments discussed in section 2.7 of the Application, provides flexibility to customers while also maintaining the intent of the Program as a load offset program.

- 2.27.1 Please provide the value of the energy received and the cost shifting that occurs from non-participants for each customer if possible or explain why it is not possible.

RESPONSE:

Attachment 1 to this response compares the current Energy Price of 9.99 cents per kWh against the methodology proposed in the Application, using the historical Energy Price values provided in BC Hydro's response to BCSEA IR 1.11.2.

The Difference column provides a reasonable approximation, by year, of the cost shifting from each customer to non-participating customers, due to the Surplus Energy Payments that were provided.

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

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27.0 Reference: Exhibit B-5, CEC 1.7.5 and CEC 1.9.1

1.7.5 For each of the 5 customers who received surplus energy payments ranging from \$28,000 to \$74,000 in 2018, please:

- a) provide their historical annual billing and surplus energy payments for the last five years;
- b) identify the generation type; and
- c) identify their rate class.

Customers may be identified by number or letter to maintain confidentiality.

RESPONSE:

All five customers who received Surplus Energy Payment between \$28,000 and \$74,000 in fiscal 2018 have a hydroelectric Generating Facility. The table below provides the rate schedule and billing information for fiscal 2015 to fiscal 2019.

Cust. ID	Rate	Size (kW)	F2015		F2016		F2017		F2018		F2019	
			Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)	Bill (\$)	Surplus Energy Payment (\$)
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2	1300	100					85	60,156	116	59,095	124	58,130
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5	1300	50	75	30,390	82	32,837	86	32,428	119	28,764	124	26,937

1.9.1 Does 110% represent an increase from the original of 100%? If so, why did BC Hydro believe it is necessary to increase the

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RESPONSE:

Currently, a customer's estimated Annual Load must be equal to or greater than the estimated Annual Energy Output of their Generating Facility (i.e., estimated Annual Energy Output cannot be greater than 100 per cent of estimated Annual Load).

As discussed in section 2.3 of the Application, through comments received from customers and stakeholders since the 2018 Amendment Application, BC Hydro became aware of the need to provide increased flexibility with regards to the size of a Customer's Generating Facility.

Accordingly, as discussed in section 2.7 of the Application, BC Hydro has proposed adjustments to provide additional flexibility to customers. This includes the proposal that customers (with a Generating Facility greater than 5 kW) be allowed to size their Generating Facility to have an estimated Annual Energy Output up to 110 per cent of their estimated Annual Load. As discussed in section 2.6 of the Application, this is similar to the approach taken by Newfoundland Power, Nova Scotia Power and Xcel Energy.

BC Hydro believes that this proposal, in combination with the other amendments discussed in section 2.7 of the Application, provides flexibility to customers while also maintaining the intent of the Program as a load offset program.

- 2.27.2 If BC Hydro has spoken directly with the individual customers above regarding the intentions and expectations of the net metering programs, please provide a brief summary of their views, if available.

RESPONSE:

With regards to the Application, BC Hydro has not undertaken any additional discussions with customers beyond the webinars and Engagement Survey, which are summarized in Appendix D of the Application.

Through day-to-day Program administration, BC Hydro staff spends much of their time communicating with individual customers on a variety of issues. However, we do not maintain a record of these discussions.

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28.0 Reference: Exhibit B-5, CEC 1.13.2 and CEC 1.15.4

1.13.2 Please confirm that during periods of surplus, the value of the energy received from customers to BC Hydro could appropriately be valued at the price that it can be sold for at Mid C, less the cost of transmission.

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.10.5, BC Hydro has recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods.

Please also refer to BC Hydro's response to BCSEA IR 1.11.1 where we explain that the rationale for using an unadjusted Mid-C price as the Energy Price and to BC Hydro's response to NMRG IR 1.4.1 where we explain that Mid-C is well established as an appropriate proxy for market value in the Electric Tariff and that excess energy from customers in the Program has negligible direct value in wholesale markets.

RESPONSE:

Please refer to BC Hydro's response to BCOAPO IR 1.8.2 where we provide the Energy Price with and without an adjustment for line losses and wheeling charges, based on a range of theoretical annual average Mid-C market prices.

The following calculation would determine the line losses and wheeling charges for the Energy Price based on calendar year 2018 data.

Annual Average Mid-C Price (2018): USD \$30.76/MWh.

Line Losses: (1.9% x USD \$30.76/MWh) = USD \$0.58/MWh.

Wheeling Charges: USD \$5.16/MWh.

Total Cost for 2018 (USD): \$0.58 + \$5.16 = USD \$5.74/MWh.

2018 Exchange Rate = 1.2957 CAD/USD
 (source: <https://www.bankofcanada.ca/rates/exchange/annual-average-exchange-rates/>).

Total Cost for 2018 (CAD): \$5.74 x 1.2957 = CAD \$7.44/MWh (\$0.00744/KWh).

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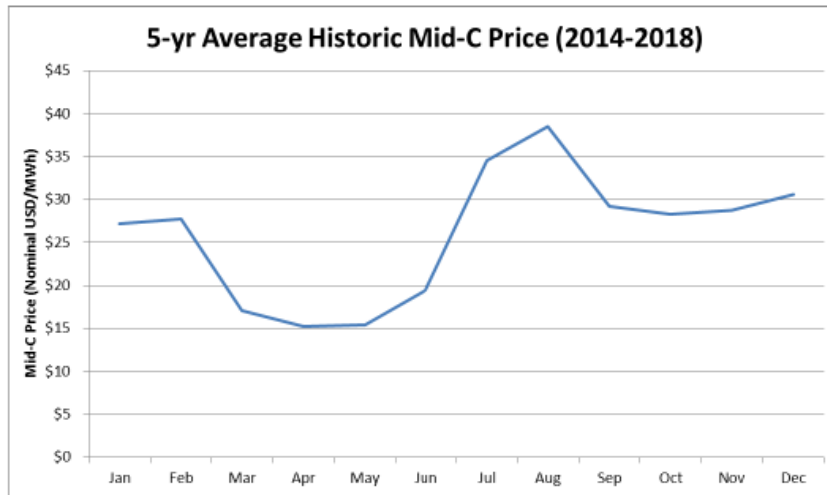
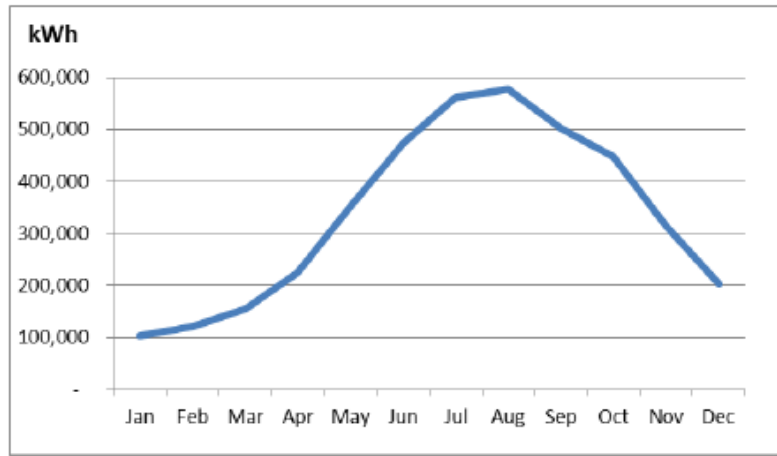
2.28.1 Did BC Hydro account for transmission costs when accounting for the value of energy received? Please discuss and explain why or why not.

RESPONSE:

To maintain a simple and easy to understand approach, the costs associated with transmission of the excess energy BC Hydro receives from customers in the Program to the Mid-C market have not been included in the proposed Energy Price.

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29.0 Reference: Exhibit B-3, CEC 1.13.3 and 1.13.4 and 1.7.5



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- 1.7.5 For each of the 5 customers who received surplus energy payments ranging from \$28,000 to \$74,000 in 2018, please:
- a) provide their historical annual billing and surplus energy payments for the last five years;
 - b) identify the generation type; and
 - c) identify their rate class.

Customers may be identified by number or letter to maintain confidentiality.

RESPONSE:

All five customers who received Surplus Energy Payment between \$28,000 and \$74,000 in fiscal 2018 have a hydroelectric Generating Facility. The table below provides the rate schedule and billing information for fiscal 2015 to fiscal 2019.

- 2.29.1 Please provide a brief discussion as to how hydroelectric projects such as those of the five high-producing customers differ from solar photovoltaic in the timing of energy produced, and graph according to month.

RESPONSE:

In general, the profile of energy outflow delivered to BC Hydro in 2018 from solar participants¹ in the Program differs from that of hydro participants in the Program in the following ways:

- Solar energy is delivered predominantly in the spring and summer months, while hydro energy is delivered with a comparatively flat annual profile and a small peak in July through August; and
- Solar energy is delivered predominantly during Heavy Load Hours, while hydro energy is delivered with a comparatively flat annual profile between Heavy Load Hours and Light Load Hours. Please refer to BC Hydro's response to BCUC IR 1.12.2.1 for a definition of Heavy Load Hours and Light Load Hours.

The table below provides the monthly energy received from solar and hydro participants in the Program in 2018.

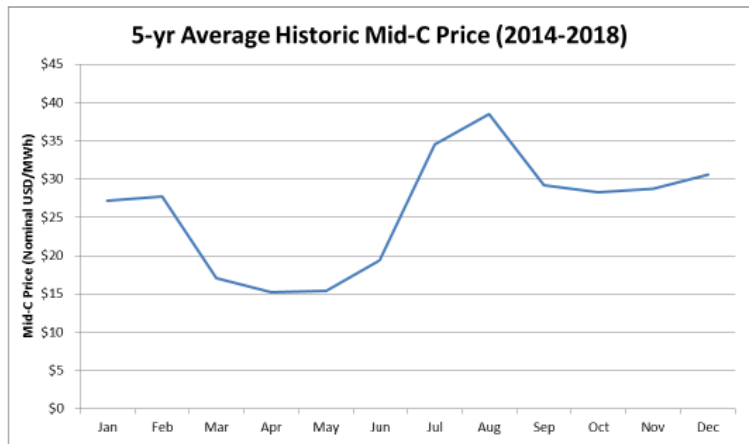
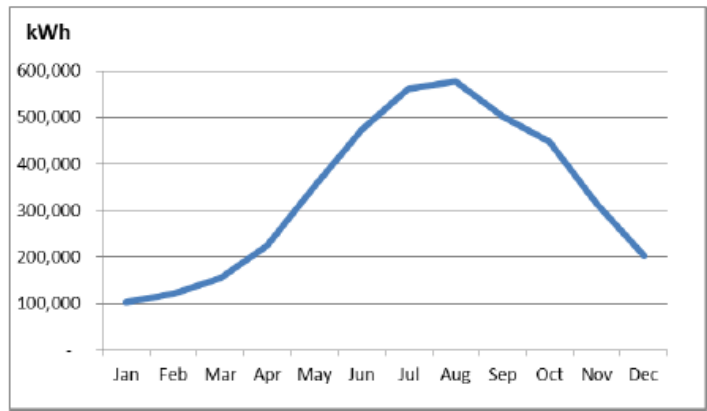
¹ Solar participants include all non-hydroelectric participants.

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Month (Calendar Year 2018)	Generation Delivered from Solar Customers in the Program (MWh)	Generation Delivered from Hydro Customers in the Program (MWh)
January	32	131
February	93	117
March	278	131
April	409	121
May	804	159
June	660	201
July	911	216
August	716	201
September	495	184
October	362	139
November	118	166
December	55	145

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29.0 Reference: Exhibit B-3, CEC 1.13.3 and 1.13.4 and 1.7.5



1.7.5 For each of the 5 customers who received surplus energy payments ranging from \$28,000 to \$74,000 in 2018, please:

- a) provide their historical annual billing and surplus energy payments for the last five years;
- b) identify the generation type; and
- c) identify their rate class.

Customers may be identified by number or letter to maintain confidentiality.

RESPONSE:

All five customers who received Surplus Energy Payment between \$28,000 and \$74,000 in fiscal 2018 have a hydroelectric Generating Facility. The table below provides the rate schedule and billing information for fiscal 2015 to fiscal 2019.

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2.29.2 If there is a significant difference, please discuss the differences in the value of energy received from hydroelectric energy and solar photovoltaic and quantify based on the timing of surplus and deficit and Mid-C pricing.

RESPONSE:

As set out in BC Hydro's responses to BCOAPO IRs 2.22.2 and 2.22.3, respectively:

- the average 2018 value for solar PV energy¹ if the monthly solar PV energy delivered to BC Hydro from customers in the Program in Light Load Hours and Heavy Load Hours were valued at the average monthly Mid-C price in the Light Load Hours and Heavy Load Hours, respectively, would be 4.7 cents per kWh; and
- the average 2018 value for hydro energy, using the same approach, would be 4.2 cents per kWh.

¹ This accounts for all non-hydro energy, which is primarily solar PV energy

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30.0 Reference: Exhibit B-5, CEC 1.16.3

1.16.3 Please confirm or otherwise explain that customers with unauthorized generation are not able to offset their energy bills and do not receive compensation from BC Hydro in any form.

RESPONSE:

BC Hydro does not compensate customers with unauthorized generators for energy received by BC Hydro; however, the energy produced and consumed by the customer offsets the customer's load and reduces the amount of energy purchased from BC Hydro by the customer.

2.30.1 What options are available to a customer who requires back-up generation in the event that BC Hydro service is temporarily unavailable?

RESPONSE:

Customers can connect back-up generation either via a transfer switch or by using an inverter with a stand-alone output that is not interconnected with the BC Hydro system.

Open transition transfer switches (i.e., break before make) that are certified to CSA standards and installed in accordance with the BC Electrical Safety Regulation, may be installed without notifying BC Hydro.

Closed transition transfer switches (i.e., make before break), are commonly used in hospitals where a momentary outage is not acceptable during the transition back to BC Hydro supply. As these generators briefly connect to the BC Hydro system, BC Hydro requires customers to obtain interconnection approval from BC Hydro and follow BC Hydro's Closed Transition Transfer Interconnection Requirements.

Inverters can be used to supply back-up power in conjunction with batteries and other energy sources such as solar PV. The inverters and associated electrical equipment must be certified to CSA standards and installed in accordance with the BC Electrical Safety Regulation. Inverters that only have a stand-alone output

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that is not connected to the BC Hydro system do not need to seek BC Hydro approval. Inverters that have both a stand-alone output and a utility output also need to meet BC Hydro's Interconnection requirements and obtain BC Hydro's approval for connection.

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31.0 Reference: Exhibit B-5, CEC 1.17.1.2

1.17.1.2 If no, how and when can the Commission determine at what point it would be appropriate for the tariff to recover fixed costs? Please explain.

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.18.1, BC Hydro will monitor the level of cost-shifting between customers in the Program and non-participating customers. Additional amendments to further improve cost recovery from Program participants may be included in future applications.

2.31.1 Does BC Hydro propose to report on cost shifting in the program on a regular basis to the BCUC?

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 2.25.1, BC Hydro plans to include a detailed analysis on cost shifting in its next Net Metering evaluation report. BC Hydro is amenable to including an analysis in future evaluation reports should the BCUC determine it would be of value.

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31.0 Reference: Exhibit B-5, CEC 1.17.1.2

1.17.1.2 If no, how and when can the Commission determine at what point it would be appropriate for the tariff to recover fixed costs? Please explain.

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.18.1, BC Hydro will monitor the level of cost-shifting between customers in the Program and non-participating customers. Additional amendments to further improve cost recovery from Program participants may be included in future applications.

2.31.1 Does BC Hydro propose to report on cost shifting in the program on a regular basis to the BCUC?

2.31.1.1 If yes, please explain when and how this would be accomplished.

RESPONSE:

Please refer to BC Hydro's response to CEC IR 2.31.1.

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31.0 Reference: Exhibit B-5, CEC 1.17.1.2

1.17.1.2 If no, how and when can the Commission determine at what point it would be appropriate for the tariff to recover fixed costs? Please explain.

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.18.1, BC Hydro will monitor the level of cost-shifting between customers in the Program and non-participating customers. Additional amendments to further improve cost recovery from Program participants may be included in future applications.

2.31.1 Does BC Hydro propose to report on cost shifting in the program on a regular basis to the BCUC?

2.31.1.2 If no, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to CEC IR 2.31.1.

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32.0 Reference: Exhibit B-3, BCUC 1.18.3

1.18.3 Please comment on how BC Hydro expects the size of the NM program to change in 5 years' time (2024) in terms of i) number of customers enrolled, and ii) total energy generated under the program.

RESPONSE:

BC Hydro does not have a projection of overall Program growth; however, BC Hydro has prepared a high-level projection of the growth of customer rooftop solar participation in the Program. Approximately 98 per cent of customers in the Program have rooftop solar generation.

The projection is based on an estimate of total customer rooftop space that is technically suitable for installation of solar photovoltaics, and a model of customer adoption described by the National Renewable Energy Lab's Distributed Generation Market Demand Model.¹ The model inputs (e.g., solar equipment costs, solar installation costs, customer adoption parameters) are all subject to significant uncertainty. Therefore, the rate of solar adoption is highly uncertain and the projection provided below should be considered as indicative of the scale of Net Metering growth over the next five years.

2.32.1 Why did BC Hydro not consider the potential for hydroelectric generation when the surplus generation can be so significant? Please explain.

RESPONSE:

The projection provided in BC Hydro's response to BCUC IR 1.18.3 is a high-level projection of Program growth and not a projection of excess generation.

Over the long term, BC Hydro expects that the growth of the Program will largely be determined by the growth of solar generation because:

- Solar generation is theoretically viable for a majority of BC Hydro customers, and the economics are projected to improve as the cost of photovoltaic systems decreases; and
- The viability of hydroelectric generation is limited to a relatively small number of customers with access to hydroelectric resources at their premise.

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33.0 Reference: Exhibit B-5, CEC 1.18.2 and 1.19.2

1.18.2 Please provide the total cost that BC Hydro has paid for the net metering connections to the system over each of the last five years.

RESPONSE:

The table below provides the costs for BC Hydro system upgrades related to net metering connections for the past five fiscal years.

	F2015	F2016	F2017	F2018	F2019	Total
Cost (\$)	0	11,000	11,000	0	6,000	28,000

1.19.2 What might constitute 'system' constraints? Please explain and provide an example.

RESPONSE:

This answer also responds to CEC IRs 1.19.3 and 1.19.4

System constraints refer to any constraints on interconnecting new generation imposed by the design or operation of the existing BC Hydro system as a whole. Technical constraints generally refer to specific technical limitations of individual pieces of standard equipment.

System constraints can be eliminated by adding or upgrading infrastructure or by changing the configuration or operation of the BC Hydro system.

If the cost associated with eliminating the system or technical constraints is high, this creates a financial constraint. Financial constraints can also be created when the operation of new generation facilities negatively impacts BC Hydro's existing contractual agreements.

An example of a system constraint is a substation transformer overload caused by interconnecting a new generator. Potential options to address such an overload include upgrading the transformer, performing switching (if possible) or reducing the output of dispatchable generation.

An example of a technical constraint is the limit imposed on connecting generation to a distribution feeder due to the thermal ratings of the largest standard distribution conductor. This constraint could be eliminated by building another distribution feeder.

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2.33.1 Please provide order of magnitude costs that BC Hydro would not consider appropriate to undertake for interconnecting new generation.

RESPONSE:

BC Hydro's response to CEC IR 1.18.1 and 1.18.2 generally describes the upgrades that BC Hydro considers appropriate to undertake to interconnect new generation under the Program and provides the average cost for projects requiring upgrades.

The order of magnitude cost for this work is generally less than \$10,000.

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3.0 City of Fort St. John Micro-Hydro

Reference: **Exhibit B-3, BCUC IR 5.3, Exhibit B 5, BC Community Solar Coalition (BCCSC) IR 6.3, BCUC IR 27.1, 27.2, City of Fort St. John IR 1.3.1, 1.3.2**
Net Metering Program as a load offset program

2.3.4 Can BC Hydro share insight on why they supported the City of Fort St John to advance the project as is structured, given the now clearly stated program objective of "load offsetting"? In responding to this question, it is important to recall that the City's project was celebrated with BC Hydro as the first community-owned project of this nature at the scale of 100 kW.

RESPONSE:

As discussed in BC Hydro's response to FORT ST. JOHN IRs 1.1.1, 1.1.2 and 1.3.1, at the time that the City of Fort St. John was exploring the development of its generation project:

- **Rate Schedule 1289 did not provide BC Hydro with the discretion to deny applications from customers with Oversized Generating Facilities;**
- **Both the Standing Offer Program and the Net Metering Program were available options for the project; and**
- **BC Hydro was not contemplating the amendments proposed in the Application.**

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3.0 City of Fort St. John Micro-Hydro

**Reference: Exhibit B-3, BCUC IR 5.3, Exhibit B 5, BC Community Solar Coalition (BCCSC) IR 6.3, BCUC IR 27.1, 27.2, City of Fort St. John IR 1.3.1, 1.3.2
Net Metering Program as a load offset program**

2.3.5 If the true goal of the Net Metering Program is to offer a "load offsetting" mechanism for its customers, how come BC Hydro did not include a virtual/community net metering component in this BCUC application? Would its inclusion not have represented a more fair and complete proposal for the BCUC's consideration? Please note that the City is of the opinion that such a measure would have represented a meaningful option for existing Net Metering Program customers, to limit their respective material financial impacts associated with the proposed changes to the program, while limiting future payments by BC Hydro for surplus energy?

RESPONSE:

In BC Hydro's view, adequate consideration of the various potential approaches to Virtual Net Metering and their potential implications would require additional time and engagement beyond what was feasible to undertake as part of the Application, considering the requirement to file by April 30, 2019.

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3.0 City of Fort St. John Micro-Hydro

Reference: **Exhibit B-3, BCUC IR 5.3, Exhibit B 5, BC Community Solar Coalition (BCCSC) IR 6.3, BCUC IR 27.1, 27.2, City of Fort St. John IR 1.3.1, 1.3.2**
Net Metering Program as a load offset program

2.3.6 Further to the above question, could BC Hydro provide a clear definition to the following key terms as it relates to the Net Metering Program? Meter, account, and customer. Furthermore, could BC Hydro clearly articulate how the definition of each applies in the context of the Net Metering Program?

RESPONSE:

Customer

The definition for Customer for the Net Metering Tariff (Rate Schedule 1289) is that contained within section 1.2 of BC Hydro's Electric Tariff as follows:

Customer - Any Person whose application for Service has been accepted by BC Hydro or, in the absence of such an application, the Person with possession of the Premises to which Service is provided or the Owner or such other Person designated as the Customer pursuant to the Electric Tariff. If a Customer receives Service at more than one Premises, such Customer will be considered a separate Customer for each Premises. BC Hydro will determine the number of Premises for the purpose of this definition.

As it relates to Net Metering, BC Hydro considers a customer a single Program customer receiving service under the terms of Rate Schedule 1289 through one meter at a Premise.

Account

Account is not a defined term within BC Hydro's Electric Tariff. However, it is often used interchangeably with the term "Customer". An account is generally considered a customer taking service through one meter at a Premise.

As it relates to Net Metering, BC Hydro considers an account a single Net Metering customer receiving service under the terms of Rate Schedule 1289 through one meter at a Premise.

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Meter

Meter- While “meter” is not a defined term in the Electric Tariff the term metering equipment is and reads as follows:

Metering Equipment (Meter) - An assembly of metering and ancillary equipment, including one or more Legacy Meters, Radio-off Meters and / or Smart Meters, auxiliary control units, cabling, communication links, range extenders and any other devices owned and used by BC Hydro in connection with metering Electricity for a Premises, providing remote access to the metered data and / or monitoring the condition of the installed equipment, as applicable.

As it relates to Net Metering, Rate Schedule 1289 contains a section labelled metering, which states that inflows and outflows to a Customer will be determined by a single meter capable of measuring flows of electricity in both directions.

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4.0 Engagement Survey and Fairness

Reference: Figure E-4, CFSJ IR 1.4.2

BC Hydro continually references the conclusion that there is a need to change the program in support of fairness to all rate payers. However, with a limited consultation process and no direct consultation or communication with the City, it is difficult for the City Fort St John to appreciate how the proposed changes are fair.

2.4.3 Given the above statement, we request that BC Hydro explain why no direct consultation or communication process was executed with those potentially materially impacted by the proposed changes; especially given that BC Hydro could have easily identified the limited number of existing customers (5) that currently represent the majority of surplus energy to the grid?

RESPONSE:

BC Hydro provided notice of the webinars and Engagement Survey to all customers in the Program, including those with applications pending, who consented to receive Program updates.

Given the City of Fort St. John's interest, BC Hydro will reach out to the City of Fort St. John and other customers who did not provide consent to receive communications on Program updates.

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4.0 Engagement Survey and Fairness

Reference: Figure E-4, CFSJ IR 1.4.2

BC Hydro continually references the conclusion that there is a need to change the program in support of fairness to all rate payers. However, with a limited consultation process and no direct consultation or communication with the City, it is difficult for the City Fort St John to appreciate how the proposed changes are fair.

2.4.3.1 Further, could BC Hydro share any and all data and analysis related to the fairness of the proposed changes as soon as possible given the material financial impact to the City of Fort St John?

RESPONSE:

An analysis of the cost-shifting between customers in the Program and non-participating customers is provided in BC Hydro's response to BCUC IR 1.5.2. With regards to the Energy Price specifically, cost-shifting calculations are provided in BC Hydro's response to CEC IR 1.7.3.

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4.0 Engagement Survey and Fairness

Reference: Figure E-4, CFSJ IR 1.4.2

BC Hydro continually references the conclusion that there is a need to change the program in support of fairness to all rate payers. However, with a limited consultation process and no direct consultation or communication with the City, it is difficult for the City Fort St John to appreciate how the proposed changes are fair.

2.4.4 Given the very limited consultation process executed and no direct engagement with the City with respect to the proposed Rate Schedule changes, would BC Hydro reconsider its grandfathering period to an evidence-based/collaborative approach that supports fairness to the City and other Net Metering customers? This is suggested given the assumed limited impact to all rate payers (estimated to be approximately \$200,000 savings) relative to the material impact anticipated from the proposed changes upon the City of Fort St. John?

RESPONSE:

BC Hydro believes that the proposed five-year transitional Energy Price is reasonable, for the reasons discussed in BC Hydro's response to BCUC IR 1.15.1.

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5.0 Firm Energy

Reference: NMRP IR 1.4.1, BCSEA IR 1.21.4

2.5.1 The City's Micro-Hydro Project offers BC Hydro firm power given it has an engineered "reservoir"; offering a consistent and reliable energy generation profile. Has this been considered in the definition of firm power used as part of this BC Hydro application to the BCUC?

RESPONSE:

No. Generally, net generation (outflow) from customers in the Program is not firm and continuous. In addition, under the terms of Rate Schedule 1289, customers in the Program are not obligated to generate electricity.

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6.0 Fairness

Reference: BCCSC IR 1.4.4

- 2.6.1 Has BC Hydro calculated the total financial impact of the proposed surplus energy rate change payments from \$99.90 / MWh to the Mid C rate to all rate payers? Based on information provided to date, this represents approximately \$200,000 in savings to BC Hydro's total expenditures. Is that estimated differential (i.e. savings) material in the context of BC Hydro's overall budget and if so, please detail how these savings will directly benefit all rate payers?

RESPONSE:

Please refer to BC Hydro's response to CEC IR 1.7.3 for the information requested in the question. BC Hydro expects that, absent an update to the Energy Price, cost shifting associated with Surplus Energy Payments would increase as participation in the Program continues to grow.

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7.0 Integrated Resource Plan

Reference: BCCSC IR 1.5.1, BCCSC IR 1.5.5, BCSEA IR 1.7.12

BC Hydro references the inclusion of Net Metering in the next Integrated Resource Plan. How does the following relate to the existing Integrated Resource Plan?

- 2.7.1 Could BC Hydro provide a clear explanation as to why it wishes to change the surplus energy rate to the Mid C rate, with regards to specific policy /program objectives it has outlined in the existing Integrated Resource Plan as it pertains to the Net Metering Program? Further, please provide analysis that suggests this change will meaningfully support these specific objectives?

RESPONSE:

The Load Resource Balance of the 2013 Integrated Resource Plan is out of date, which has implications for how BC Hydro values incremental energy. BC Hydro's reasons for the proposed update to the Energy Price are provided in section 4 of the Application and further explained in BC Hydro's response to BCUC IR 1.10.2.

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#2 Does Hydro intend to be fair to all customers with the pricing of power they acquire and does Hydro not in future intend to average out the cost of new power with that of the heritage assets, but only acquire power that can be sold as a net benefit to the Province?

Response Please refer to BC Hydro’s response to BCUC IR 1.10.2 where we explain why it is appropriate to value excess generation from customers in the Program based on the market value.

Hydro’s referral in their response to my second question, to BCUCs question 1.10.2 which refers to 1.10.1 as well, and section 4.6 of the application, etc etc, does not answer my question unless Hydro has a more explicit link. I will try to rephrase the question.

2.2.1.a Does Hydro intend to be fair to all customers with the pricing of power they acquire,?

RESPONSE:

The intent of the proposed amendment with regards to the Energy Price is to address the cost-shifting that occurs between participating and non-participating customers with regards to Surplus Energy Payments. BC Hydro believes that the proposed Energy Price addresses this cost-shifting because it better reflects the value that BC Hydro receives from excess generation from customers in the Program, which will improve fairness between participating and non-participating customers.

Hadland, Randal Information Request No. 2.2.1.b Dated: September 29, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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#2 Does Hydro intend to be fair to all customers with the pricing of power they acquire and does Hydro not in future intend to average out the cost of new power with that of the heritage assets, but only acquire power that can be sold as a net benefit to the Province?

Response Please refer to BC Hydro’s response to BCUC IR 1.10.2 where we explain why it is appropriate to value excess generation from customers in the Program based on the market value.

Hydro’s referral in their response to my second question, to BCUCs question 1.10.2 which refers to 1.10.1 as well, and section 4.6 of the application, etc etc, does not answer my question unless Hydro has a more explicit link. I will try to rephrase the question.

2.2.1.b Does Hydro intend to average the cost of new power with that of the heritage assets?

RESPONSE:

As discussed in BC Hydro’s response to BCUC IR 1.10.5, BC Hydro has recently adopted the market price as a conservative interim assumption for evaluating new energy resources during surplus and deficit periods.

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#2 Does Hydro intend to be fair to all customers with the pricing of power they acquire and does Hydro not in future intend to average out the cost of new power with that of the heritage assets, but only acquire power that can be sold as a net benefit to the Province?

Response Please refer to BC Hydro’s response to BCUC IR 1.10.2 where we explain why it is appropriate to value excess generation from customers in the Program based on the market value.

Hydro’s referral in their response to my second question, to BCUCs question 1.10.2 which refers to 1.10.1 as well, and section 4.6 of the application, etc etc, does not answer my question unless Hydro has a more explicit link. I will try to rephrase the question.

2.2.1.c Does Hydro only acquire power that can be sold as a net benefit to the Province?

RESPONSE:

Generally, when BC Hydro acquires power from third parties, it seeks to enter into agreements that are cost effective over the term of the agreement. As discussed in BC Hydro’s response to BCUC IR 1.10.2, BC Hydro believes excess generation from customers in the Program should be based on market prices.

Hadland, Randal Information Request No. 2.3.1 Dated: September 29, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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#3 What factors is Hydro taking into account when it determines that unfairness might infringe on the non participating customers?

Response Please refer to BC Hydro’s response to BCUC IR 1.5.1 where we explain how cost-shifting between customers in the Program and non-participating customers occurs and to BC Hydro’s response to CEC IR 1.7.3 where we quantify the cost-shifting caused by the current Energy Price.

2.3.1 Ie. how does the cost shifting compare, financially, to the unfairness of building a dam at site c and selling that energy at about 1/3rd of cost dropping the remainder of the cost on the same customers Hydro is currently trying to reduce benefits of net metering to?

RESPONSE:

The Site C Project does not result in cost-shifting because all ratepayers receive the benefits and the cost will be recovered from all ratepayers. The proposed update to the Energy Price is intended to address the cost-shifting associated with Surplus Energy Payments by better reflecting the value that non-participating ratepayers receive from excess generation from customers in the Program.

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#3 What factors is Hydro taking into account when it determines that unfairness might infringe on the non participating customers?

Response Please refer to BC Hydro’s response to BCUC IR 1.5.1 where we explain how cost-shifting between customers in the Program and non-participating customers occurs and to BC Hydro’s response to CEC IR 1.7.3 where we quantify the cost-shifting caused by the current Energy Price.

2.3.2 Are environmental factors included in Hydros assessment of the unfairness of allowing micro solar systems compared to the unfairness of building a dam on land we need for a sustainable future?

RESPONSE:

BC Hydro’s assessment of the cost-shifting between customers in the Program and non-participating customers is set out in BC Hydro’s responses to BCUC IRs 1.5.1 and 1.5.2.

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#4 Would Hydro explain in what way does this respond to changing technological advancements?---question from page 41, "BC Hydro believes that the proposed amendment should be approved. The amendment.... Responds to the Evaluation Report which indicated that the Energy Price would be reviewed to ensure alignment with changing technological advancements and changing system needs."

Response The reference to changing technological advancements is meant to convey BC Hydro's intention to review the Energy Price, considering, among other things, the value of energy, based on technological advancements. Please refer to BC Hydro's response to BCUC IR 1.10.5 where we state that BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods, in part, due to technology cost uncertainty over the long term.

2.4.1.a Does Hydro believe that this amendment application for net metering responds to the falling price of alternatives in a manner that represents the best interests of British Columbians? If so, did Hydro look at other ways of responding, and what alternatives were considered?

RESPONSE:

Please refer to section 4 of the Application for a discussion of the background and rationale for the proposed update to the Energy Price as well as the alternatives considered.

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#4 Would Hydro explain in what way does this respond to changing technological advancements?---question from page 41, "BC Hydro believes that the proposed amendment should be approved. The amendment.... Responds to the Evaluation Report which indicated that the Energy Price would be reviewed to ensure alignment with changing technological advancements and changing system needs."

Response The reference to changing technological advancements is meant to convey BC Hydro's intention to review the Energy Price, considering, among other things, the value of energy, based on technological advancements. Please refer to BC Hydro's response to BCUC IR 1.10.5 where we state that BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods, in part, due to technology cost uncertainty over the long term.

2.4.1.b Does Hydro believe that the lower market price is also caused in part by surpluses here in BC and in markets like California?

RESPONSE:

The market price for electricity fluctuates based on a number of factors, including, but not limited to, the availability of supply resources, the demand for electricity, weather conditions, gas market prices and exchange rates. Accordingly, BC Hydro cannot speculate as to which market factors could cause a "lower market price" during certain time periods.

Hadland, Randal Information Request No. 2.4.1.c Dated: September 29, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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#4 Would Hydro explain in what way does this respond to changing technological advancements?---question from page 41, "BC Hydro believes that the proposed amendment should be approved. The amendment.... Responds to the Evaluation Report which indicated that the Energy Price would be reviewed to ensure alignment with changing technological advancements and changing system needs."

Response The reference to changing technological advancements is meant to convey BC Hydro's intention to review the Energy Price, considering, among other things, the value of energy, based on technological advancements. Please refer to BC Hydro's response to BCUC IR 1.10.5 where we state that BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods, in part, due to technology cost uncertainty over the long term.

2.4.1.c Has Hydro evaluated whether this application is a more fiscally responsible approach than developing a major bundle of energy like Site C? If so, please provide that evaluation.

RESPONSE:

As discussed in BC Hydro's response to NMRG IR 1.4.1, net generation (outflow) from customers in the Program is intermittent, infrequent, non-firm energy that cannot be accurately forecasted, planned or operationalized. The Site C Project is a flexible capacity resource that will be available upon demand, facilitate the integration of intermittent renewable resources like wind and solar, contribute to the reduction of greenhouse gas emissions, and provide other reliability benefits.

Hadland, Randal Information Request No. 2.6.1 Dated: September 29, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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#6 Is it possible through this amendment, that Hydro could purchase low cost energy from consumers and sell back high priced power?

Response Please refer to BC Hydro’s response to BCUC IR 1.12.4 where we explain why BC Hydro’s proposed approach to update the Energy Price provides a reasonable approximation of the value of the energy received by BC Hydro. Please also refer to BC Hydro’s response to BCUC IR 1.5.1 where we explain how cost-shifting occurs between customers in the Program and non-participating customers with regards to Surplus Energy Payments.

2.6.1 I don't believe that Hydro answered this question so I will repeat it. Is it possible through this amendment, that Hydro could purchase low cost energy from consumers and sell back high priced power?

RESPONSE:

No, it is not possible that, through this amendment BC Hydro could purchase low cost energy from consumers and sell back high priced power.

Customers must first offset their load requirements, and then any net generation (outflow) is captured in the Generation Account and can be drawn down throughout the year when customer load exceeds generation. Any remaining Generation Account Balance is paid out on the Anniversary Date.

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#7 With respect to the objectives mentioned on page 3, Who and how and when were these objectives established?

Response The objectives set out in section 1.1 of the Application reflect the regulatory history of the Program, including the minimum parameters set out by the BCUC in 2003 by Letter No. L-37-03. As explained in section 1.3 of the Application, the BCUC has previously determined that the energy objectives in the Clean Energy Act support a focus on economic efficiency. BC Hydro believes that the proposed amendments reflect economic efficiency because they improve the allocation of costs between customers in the Program and non-participating customers with regards to Surplus Energy Payments.

2.7.a IE, are these objectives identified in the Clean Energy act that ordered Hydro to establish programs that encourage people to self generate electricity?

RESPONSE:

The *Clean Energy Act* does not require BC Hydro to establish programs to encourage self-generation of electricity. Please refer to BC Hydro’s response to BCUC IR 2.27.1, where we explain that the purpose of the Program to be a load offset program dates back to the inception of the Net Metering Program.

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#7 With respect to the objectives mentioned on page 3, Who and how and when were these objectives established?

Response The objectives set out in section 1.1 of the Application reflect the regulatory history of the Program, including the minimum parameters set out by the BCUC in 2003 by Letter No. L-37-03. As explained in section 1.3 of the Application, the BCUC has previously determined that the energy objectives in the Clean Energy Act support a focus on economic efficiency. BC Hydro believes that the proposed amendments reflect economic efficiency because they improve the allocation of costs between customers in the Program and non-participating customers with regards to Surplus Energy Payments.

2.7.a.1 IE, are these objectives identified in the Clean Energy act that ordered Hydro to establish programs that encourage people to self generate electricity? Such as Energy objective 2 (d) to use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources;

or 2 (k) to encourage economic development and the creation and retention of jobs;

or 2 (l) to foster the development of first nation and rural communities through the use and development of clean or renewable resources;

or 2 (m) to maximize the value, including the incremental value of the resources being clean or renewable resources, of British Columbia's generation and transmission assets for the benefit of British Columbia;

or 2 (p) to ensure the commission, under the Utilities Commission Act, continues to regulate the authority with respect to domestic rates but not with respect to expenditures for export, except as provided by this Act.

RESPONSE:

In BC Hydro's view, in order to achieve many of the objectives referenced in the preamble to the question, the cost-shifting between customers in the Program and non-participating customers must be addressed. Otherwise, any benefits to customers in the Program are supported through higher costs for non-participating customers.

Hadland, Randal Information Request No. 2.8.1 Dated: September 29, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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#8 Has Hydro analyzed whether the amendment might increase fairness in the relatively narrow circumstances outlined in the application to determine if it produces an increase in total unfairness, in total cost of the system, in terms of social and environmental costs if the amendment goes through and discourages customers from adapting alternative energies that are less costly than a dam at site c?

Response BC Hydro believes that the proposed amendments in the Application are a step towards improving cost recovery from customers in the Program and by extension, would be beneficial to ratepayers overall.

2.8.1 I don't believe Hydro answered this question so I will repeat it.

Has Hydro analyzed whether the amendment might increase fairness in the relatively narrow circumstances outlined in the application to determine if it produces an increase in total unfairness, in total cost of the system, in terms of social and environmental costs if the amendment goes through and discourages customers from adapting alternative energies that are less costly than a dam at site c?

RESPONSE:

BC Hydro does not believe that the amendments proposed in the Application will increase overall costs to ratepayers. Rather, updating the Energy Price to reflect the value of excess generation from customers in the Program will address the cost-shifting that occurs between customers in the Program and non-participating customers with regards to Surplus Energy Payments.

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14.0 Topic: SIZE OF GENERATING FACILITY

Reference: Exhibit B-3, PDF 66 – BCUC 1.5.2.

BCUC IR 1.5.2 requested:

"Please quantify the "cost-shifting" to non-participants by illustrating the cost recovery from the following hypothetical customers, including a breakdown and an illustrative example of the bill that the customer would pay in each billing cycle: i) an average SGS customer non-NM customer; ii) a hypothetical average SGS customer who offsets 50% of his/her own consumption with NM generation within each billing cycle; iii) a hypothetical average SGS customer who offsets 100% of his/her consumption within each billing cycle."

BCH Response included:

"Figure 1 below shows the actual net generation (outflow) pattern of 409 Residential (RS 1101) Net Metering customers in fiscal 2016. As shown, **these outflows have high seasonal variability, peaking in summer and approaching zero in winter.** Therefore, it would not be meaningful to estimate bills for scenarios where a Net Metering customer offsets either 50 per cent or 100 per cent of their consumption, in each billing cycle, as suggested in the question. Rather, illustrative bills are presented for Net Metering customers who offset either 50 per cent of 100 per cent of their consumption over the entire year, assuming that their generation follows the pattern shown in Figure 1 below." (emphasis added)

2.14.1 Do the graphs and explanations in this response reflect only net metering **solar** profiles? Please explain.

RESPONSE:

No, the graphs and explanations in BC Hydro's response to BCUC IR 1.5.2 do not reflect only net metering solar profiles.

The analysis was based on actual net generation (outflow) from 409 residential (Rate Schedule 1101) customers in the Program in fiscal 2016.

The generation sources were: 396 solar photovoltaic, three hydro, one hydro and solar photovoltaic, six wind, two wind and solar photovoltaic, and one biogas.

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14.0 Topic: SIZE OF GENERATING FACILITY

Reference: Exhibit B-3, PDF 66 – BCUC 1.5.2.

BCUC IR 1.5.2 requested:

"Please quantify the "cost-shifting" to non-participants by illustrating the cost recovery from the following hypothetical customers, including a breakdown and an illustrative example of the bill that the customer would pay in each billing cycle: i) an average SGS customer non-NM customer; ii) a hypothetical average SGS customer who offsets 50% of his/her own consumption with NM generation within each billing cycle; iii) a hypothetical average SGS customer who offsets 100% of his/her consumption within each billing cycle."

BCH Response included:

"Figure 1 below shows the actual net generation (outflow) pattern of 409 Residential (RS 1101) Net Metering customers in fiscal 2016. As shown, **these outflows have high seasonal variability, peaking in summer and approaching zero in winter.** Therefore, it would not be meaningful to estimate bills for scenarios where a Net Metering customer offsets either 50 per cent or 100 per cent of their consumption, in each billing cycle, as suggested in the question. Rather, illustrative bills are presented for Net Metering customers who offset either 50 per cent of 100 per cent of their consumption over the entire year, assuming that their generation follows the pattern shown in Figure 1 below." (emphasis added)

2.14.2 Is approximately 80% of net metering excess power in winter generated by hydro facilities rather than solar? Please explain.

RESPONSE:

In 2018, approximately 65 per cent of net generation (outflow) from customers in the Program in the winter months (November to February inclusive) was from customers with hydroelectric facilities.

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14.0 Topic: SIZE OF GENERATING FACILITY

Reference: Exhibit B-3, PDF 66 – BCUC 1.5.2.

BCUC IR 1.5.2 requested:

"Please quantify the "cost-shifting" to non-participants by illustrating the cost recovery from the following hypothetical customers, including a breakdown and an illustrative example of the bill that the customer would pay in each billing cycle: i) an average SGS customer non-NM customer; ii) a hypothetical average SGS customer who offsets 50% of his/her own consumption with NM generation within each billing cycle; iii) a hypothetical average SGS customer who offsets 100% of his/her consumption within each billing cycle."

BCH Response included:

"Figure 1 below shows the actual net generation (outflow) pattern of 409 Residential (RS 1101) Net Metering customers in fiscal 2016. As shown, **these outflows have high seasonal variability, peaking in summer and approaching zero in winter.** Therefore, it would not be meaningful to estimate bills for scenarios where a Net Metering customer offsets either 50 per cent or 100 per cent of their consumption, in each billing cycle, as suggested in the question. Rather, illustrative bills are presented for Net Metering customers who offset either 50 per cent of 100 per cent of their consumption over the entire year, assuming that their generation follows the pattern shown in Figure 1 below." (emphasis added)

2.14.3 Does BC Hydro's use of solar profiles in this context skew the results of BC Hydro's analysis? Would the results of BC Hydro's analysis be significantly different if net metering excess power output from hydro rather than solar was given appropriate weighting?

RESPONSE:

Please refer to BC Hydro's response to NMRG IR 2.14.1.

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14.0 Topic: SIZE OF GENERATING FACILITY

Reference: Exhibit B-3, PDF 66 – BCUC 1.5.2.

BCUC IR 1.5.2 requested:

"Please quantify the "cost-shifting" to non-participants by illustrating the cost recovery from the following hypothetical customers, including a breakdown and an illustrative example of the bill that the customer would pay in each billing cycle: i) an average SGS customer non-NM customer; ii) a hypothetical average SGS customer who offsets 50% of his/her own consumption with NM generation within each billing cycle; iii) a hypothetical average SGS customer who offsets 100% of his/her consumption within each billing cycle."

BCH Response included:

"Figure 1 below shows the actual net generation (outflow) pattern of 409 Residential (RS 1101) Net Metering customers in fiscal 2016. As shown, **these outflows have high seasonal variability, peaking in summer and approaching zero in winter.** Therefore, it would not be meaningful to estimate bills for scenarios where a Net Metering customer offsets either 50 per cent or 100 per cent of their consumption, in each billing cycle, as suggested in the question. Rather, illustrative bills are presented for Net Metering customers who offset either 50 per cent of 100 per cent of their consumption over the entire year, assuming that their generation follows the pattern shown in Figure 1 below." (emphasis added)

2.14.4 Please confirm that the "409 residential customers in the Program served under RS 1101" as the basis for BC Hydro's actual average cost-shifting analysis for fiscal 2016 excluded any consideration of the five largest net metering excess power producing hydro generation facilities.

RESPONSE:

Not confirmed. The analysis included two of the five customers referenced in the question. For further discussion on this analysis, please refer to BC Hydro's response to BCUC IR 2.26.3.

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14.0 Topic: SIZE OF GENERATING FACILITY

Reference: Exhibit B-3, PDF 66 – BCUC 1.5.2.

BCUC IR 1.5.2 requested:

"Please quantify the "cost-shifting" to non-participants by illustrating the cost recovery from the following hypothetical customers, including a breakdown and an illustrative example of the bill that the customer would pay in each billing cycle: i) an average SGS customer non-NM customer; ii) a hypothetical average SGS customer who offsets 50% of his/her own consumption with NM generation within each billing cycle; iii) a hypothetical average SGS customer who offsets 100% of his/her consumption within each billing cycle."

BCH Response included:

"Figure 1 below shows the actual net generation (outflow) pattern of 409 Residential (RS 1101) Net Metering customers in fiscal 2016. As shown, **these outflows have high seasonal variability, peaking in summer and approaching zero in winter.** Therefore, it would not be meaningful to estimate bills for scenarios where a Net Metering customer offsets either 50 per cent or 100 per cent of their consumption, in each billing cycle, as suggested in the question. Rather, illustrative bills are presented for Net Metering customers who offset either 50 per cent of 100 per cent of their consumption over the entire year, assuming that their generation follows the pattern shown in Figure 1 below." (emphasis added)

2.14.5 Would the inclusion of the five largest net metering excess power producing hydro generation facilities in BC Hydro's actual average cost-shifting analysis for fiscal 2016 have significantly changed the results?

RESPONSE:

Two of the five accounts referenced in the question were included in the results. Both of these accounts were Residential (Rate Schedule 1101) accounts.

Two of the accounts referenced in the question are Small General Service (Rate Schedule 1300) accounts. Inclusion of Rate Schedule 1300 accounts in the analysis would not have been appropriate as the cost of service differs between Rate Schedule 1101 and Rate Schedule 1300 customers.

As stated in BC Hydro's response to BCUC IR 2.26.3, BC Hydro believes that the actual average cost shifting provided in the analysis is a representative estimate of average cost shifting for all net metering customers that took service under Rate Schedule 1101 in fiscal 2016.

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14.0 Topic: SIZE OF GENERATING FACILITY

Reference: Exhibit B-3, PDF 66 – BCUC 1.5.2.

BCUC IR 1.5.2 requested:

"Please quantify the "cost-shifting" to non-participants by illustrating the cost recovery from the following hypothetical customers, including a breakdown and an illustrative example of the bill that the customer would pay in each billing cycle: i) an average SGS customer non-NM customer; ii) a hypothetical average SGS customer who offsets 50% of his/her own consumption with NM generation within each billing cycle; iii) a hypothetical average SGS customer who offsets 100% of his/her consumption within each billing cycle."

BCH Response included:

"Figure 1 below shows the actual net generation (outflow) pattern of 409 Residential (RS 1101) Net Metering customers in fiscal 2016. As shown, **these outflows have high seasonal variability, peaking in summer and approaching zero in winter.** Therefore, it would not be meaningful to estimate bills for scenarios where a Net Metering customer offsets either 50 per cent or 100 per cent of their consumption, in each billing cycle, as suggested in the question. Rather, illustrative bills are presented for Net Metering customers who offset either 50 per cent of 100 per cent of their consumption over the entire year, assuming that their generation follows the pattern shown in Figure 1 below." (emphasis added)

2.14.6 Please provide a revised version of BC Hydro's response to BCUC 1.5.2 that fully reflects the inclusion of the five largest net metering excess power producing hydro generation facilities.

RESPONSE:

Please refer to BC Hydro's response to NMRG IR 2.14.5.

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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.1 For clarity please confirm that the Standing Offer Program (SOP) has not been cancelled, expired or otherwise terminated.

RESPONSE:

As stated in BC Hydro’s response to BCUC IR 1.10.1 and as referenced in section 4.6 of the Application, BC Hydro indefinitely suspended the Standing Offer Program in February 2019 as a result of the Government of B.C.’s Comprehensive Review of BC Hydro.

This means that BC Hydro is not accepting new applications and is not awarding any new Electricity Purchase Agreements, with the exception of five First Nations clean energy projects which were announced on March 14, 2018. The decision to indefinitely suspend the program did not impact existing executed Electricity Purchase Agreements.

For further discussion, please refer to BC Hydro’s response to BCSEA IR 1.7.5.

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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.2 Is the most accurate characterization of the current status of the SOP that BC Hydro has suspended any new applications to the SOP? Please explain.

RESPONSE:

Please refer to BC Hydro’s response to NMRG IR 2.15.1.

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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.3 Please confirm that to give effect to BC Hydro’s “indefinite suspension” of the SOP it has delivered written notice to each of its EPA (under the SOP only) counterparties to advise of that those EPAs are indefinitely suspended. If not confirmed, please explain why BC Hydro would not provide such notice to its EPA counterparties.

RESPONSE:

Not confirmed. For further discussion, please refer to BC Hydro’s response to NMRG IR 2.15.1.

Net Metering Ratepayers Group Information Request No. 2.15.4 Dated: October 3, 2019 British Columbia Hydro & Power Authority Response issued October 24, 2019	Page 1 of 1
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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.4 Please confirm that BC Hydro has in no way suspended its rights or obligations, or purported to suspend the rights and obligations of its counterparties, in any of the EPAs currently under the SOP. If the rights or obligations of either BC Hydro or its counterparties with EPAs under the SOP have been suspended or are purported to be suspended has that resulted in any current litigation or disputes? Please explain.

RESPONSE:

Confirmed. For further discussion, please refer to BC Hydro’s response to NMRG IR 2.15.1.

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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.5 Please confirm that some of the Energy Purchase Agreements (EPAs) under the SOP have 40-year terms and expressly allow for further negotiations and potential renewals and other EPAs are index linked.

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.6 Given the remaining terms of a number of EPAs under the SOP please confirm that it will be necessary for BC Hydro to continue the SOP for at least another 35 years. Please also confirm that if negotiations with EPA counterparties resulted in one or more renewal the SOP will necessarily stay in effect for more than another 35 years.

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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15.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 125 – BCUC 10.1.

The response states in part:

“In BC Hydro’s view, now that the SOP has been indefinitely suspended...”

2.15.7 Please confirm that approximately 20% of all of BC Hydro energy acquisitions are achieved acquired through EPAs under the SOP. If 20% is incorrect please provide the correct percentage.

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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16.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127-128 – BCUC 1.10.2 and PDF 201-202 – BCUC 1.15.7.

The first referenced response states in part:

“As discussed further in BC Hydro’s response to BCUC IR 1.10.1, now that the Standing Offer Program (SOP) has been indefinitely suspended, the SOP price should no longer be used as a basis for the Energy Price;”

The second referenced response states in part:

“As stated in BC Hydro’s response to BCUC IR 1.10.1, now that the Standing Offer Program has been indefinitely suspended, the Energy Price should be re-evaluated and updated accordingly.”

2.16.1 In the responses to BCUC 1.10.2 and 1.15.7 why did BC Hydro omit the qualifying phrase "in BCH's view" when referring back to BCUC 1.10.1 stating that the SOP has been indefinitely suspended?

RESPONSE:

As BC Hydro was referring back to a response, and was providing the reference to the reader, there was no need to repeat the response in its entirety.

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16.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127-128 – BCUC 1.10.2 and PDF 201-202 – BCUC 1.15.7.

The first referenced response states in part:

“As discussed further in BC Hydro’s response to BCUC IR 1.10.1, now that the Standing Offer Program (SOP) has been indefinitely suspended, the SOP price should no longer be used as a basis for the Energy Price;”

The second referenced response states in part:

“As stated in BC Hydro’s response to BCUC IR 1.10.1, now that the Standing Offer Program has been indefinitely suspended, the Energy Price should be re-evaluated and updated accordingly.”

2.16.2 Does the SOP price remain in effect for the remaining terms of the EPAs under the SOP? Please describe the process steps required for BC hydro to change the SOP price if it wishes to do so.

RESPONSE:

BC Hydro respectfully declines to answer the question as it is outside of the scope of the Application.

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17.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 128 – BCUC 1.10.2

BC Hydro's response to BCUC 1.10.2 states in part:

"The value of energy delivered to BC Hydro by customers in the Program **does not necessarily differ** among resource types:"

2.17.1 Please confirm that the value of energy delivered to BC Hydro by customers in the Net Metering Program **does or may differ** among resource types.

RESPONSE:

The value of energy delivered to BC Hydro by customers in the Program may differ based on resource types.

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17.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 128 – BCUC 1.10.2

BC Hydro's response to BCUC 1.10.2 states in part:

"The value of energy delivered to BC Hydro by customers in the Program **does not necessarily differ** among resource types:"

- 2.17.2 Please identify and discuss the variables that will affect or determine the value of energy delivered to BC Hydro by customers in the Net Metering Program such that it differs among specific resource types.

RESPONSE:

In general, the value of net generation (outflow) delivered to BC Hydro from customers in the Program is affected by the:

- **Seasonal profile of net generation (outflow) (i.e., annual energy distribution between seasons);**
- **Daily profile of net generation (outflow) (i.e., energy distribution between High Load Hours and Light Load Hours); and**
- **Alignment between the seasonal and daily profile of net generation (outflow) and the annual Mid-C price profile.**

Please refer to BC Hydro's response to CEC IR 2.29.1 for a description of how the seasonal and daily energy profiles differ between solar and hydro resources.

As set out in BC Hydro's response to CEC IR 2.29.2, application of the 2018 Mid-C price, accounting for differences in seasonal and daily energy profiles, results in a slightly higher average value for solar generation (4.7 cents per kWh) over hydro generation (4.2 cents per kWh). However, this difference is subject to change if a different year's Mid-C price is used. For further discussion on this approach, please refer to BC Hydro's response to BCOAPO IR 2.22.2.

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17.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 128 – BCUC 1.10.2

BC Hydro's response to BCUC 1.10.2 states in part:

"The value of energy delivered to BC Hydro by customers in the Program ***does not necessarily differ*** among resource types:"

2.17.3 For each resource type provide specific examples of how the variables identified in response to NMRG 17.2 above will result in different values of energy delivered to BC Hydro by customers in the Net Metering Program.

RESPONSE:

Please refer to BC Hydro's response to NMRG IR 2.17.2.

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17.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 128 – BCUC 1.10.2

BC Hydro's response to BCUC 1.10.2 states in part:

"The value of energy delivered to BC Hydro by customers in the Program ***does not necessarily differ*** among resource types:"

2.17.4 As a general proposition will excess energy generated by net metering solar facilities tend to have more variation in its value than excess energy generated by net metering hydro facilities? Please explain.

RESPONSE:

BC Hydro has not conducted an analysis to determine whether net generation (outflow) from net metering solar facilities would tend to have more variation in value than net generation (outflow) from net metering hydro facilities.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.1 Please explain further how losses, ancillary services and system capacity issues are "associated" with excess generation from customers in the Program.

RESPONSE:

To apply Rate Schedule 1289, BC Hydro only meters net generation (outflow) received and net consumption delivered at each net metering customer's meter.

Losses, ancillary services and system capacity are attributes of BC Hydro's transmission and distribution system and are not directly measured. These attributes are estimated through studies and are applied against energy sources as part of energy planning and energy procurement activities.

As discussed in BC Hydro's response to BCUC IR 1.10.2, BC Hydro has not determined the degree to which aggregate generation from customers in the Program can be relied upon over the long-term. Accordingly, and to support simplicity, BC Hydro has not applied these system attributes to excess energy from customers in the Program.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.2 Does BC Hydro already have or could it acquire new Itron smart meters?

RESPONSE:

BC Hydro has Itron smart meters and could acquire new Itron smart meters if required.

Please also refer to BC Hydro's response to NMRG IR 2.22.1 where we explain that BC Hydro has sufficient meters to estimate the energy consumed by losses and unmetered loads on a distribution feeder but cannot directly measure the losses associated with each energy source.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.3 Do meters and or other equipment from itron or other vendors provide solutions to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program? Please explain and discuss why any obstacles to those solutions can't be overcome by BC Hydro, separately addressing each of: measuring losses; ancillary services; and system capacity issues.

RESPONSE:

Please refer to BC Hydro's response to NMRG IR 2.18.1 where we explain that losses, ancillary services, and system capacity are not directly measured using meters.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro’s response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.4 In the context of BC Hydro’s apparent challenges with measuring losses, ancillary services, or system capacity associated with excess generation from customers in the Program please comment on the following statement from the itron website at [Learn](#) [Mor https://www.itron.com/na/solutions/who-we-serve/electricity](https://www.itron.com/na/solutions/who-we-serve/electricity):
“Make solar work
Integrating renewable energy sources like solar and wind makes accurate energy demand forecasting more important than ever. Itron’s forecasting framework and software accurately predicts the load volatility caused by intermittent resources—and equips utilities to schedule reserve generation much more cost effectively.”

RESPONSE:

Please refer to BC Hydro’s response to NMRG IR 2.18.1 where we explain that losses, ancillary services, and system capacity are not directly measured using meters.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.5 Apart from smart meter or other technological solutions, please confirm that all Net Metering customers necessarily have bi-directional metering.

RESPONSE:

Customers in the Program are required to have a bi-directional meter unless BC Hydro determines that dual meters would be more appropriate. Please refer to BC Hydro's response to NMRG IR 2.18.6.

As stated in BC Hydro's response to CEC IR 1.16.10, Measurement Canada defines a bi-directional meter as a meter that has the capacity to meter delivered energy or received energy and to record the energy in separate registers.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.6 Without bi-directional metering how would it be possible for BC Hydro to accurately calculate how much to charge and pay/credit Net Metering customers?

RESPONSE:

The Metering section of Rate Schedule 1289 outlines the metering requirements for Program participants and states:

1. **“Inflows of Electricity from the BC Hydro system to the Customer, and outflows of electricity from the Customer’s Generating Facility to the BC Hydro system, will normally be determined by means of a single meter capable of measuring flows of electricity in both directions; and**
2. **Alternatively, if BC Hydro determines that flows of electricity in both directions cannot be reliably determined by a single meter, or that dual metering will be more cost-effective, BC Hydro may require that separate meters be installed to measure inflows and outflows of electricity.”**

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.7 Are losses an essential part of the calculations used by BC Hydro to operate its system?

RESPONSE:

Losses are an attribute that are considered when planning and operating the BC Hydro system; however, the location of generation from a loss perspective is not considered for the dispatch of generation in real-time.

Please also refer to BC Hydro's response to NMRG IR 2.22.1 where we explain that while meters are used to estimate losses and unmetered loads, they cannot directly measure the losses associated with each energy source.

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18.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 127 – BCUC 1.10.2.

BC Hydro's response to BCUC 1.10.2 states in part:

"BC Hydro does not have any meaningful way to measure losses, ancillary services, or system capacity associated with excess generation from customers in the Program."

2.18.8 In what specific ways does do losses "associated" with excess generation from customers in the Program create any unique challenges?

RESPONSE:

BC Hydro is not aware of any unique challenges created by losses associated with excess generation from customers in the Program.

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19.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 137 – BCUC 1.11.2

BC Hydro’s response to BCUC 1.11.2 states in part:

“To provide capacity benefits, BC Hydro requires the resource to be reliably generating when needed which is typically during the system evening peak in the winter. More than 98 per cent of all customers in the Program have solar photovoltaic Generating Facilities. These resources do not provide capacity benefits because they do not have generation in winter evenings.”

2.19.1 Please reconcile the statement in the Preamble with BC Hydro’s statement in response to BCUC 1.10.2.1 that "The value of energy delivered to the grid by customers in the Program does not necessarily differ among resource types".

RESPONSE:

The statement provided in BC Hydro’s response to BCUC IR 1.11.2 refers to the potential for net generation (outflow) from customers in the Program to provide capacity benefits. At this time, BC Hydro does not consider net generation (outflow) from customers in the Program, on an aggregate basis, to provide capacity benefits.

The statement in BC Hydro’s response to BCUC IR 1.10.2.1 relates to the value of net generation (outflow) delivered to BC Hydro from customers in the Program. Please refer to BC Hydro’s response to NMRG IR 2.17.2 for further discussion with regards to the factors that may affect the value of net generation (outflow) to BC Hydro.

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19.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 137 – BCUC 1.11.2

BC Hydro's response to BCUC 1.11.2 states in part:

“To provide capacity benefits, BC Hydro requires the resource to be reliably generating when needed which is typically during the system evening peak in the winter. More than 98 per cent of all customers in the Program have solar photovoltaic Generating Facilities. These resources do not provide capacity benefits because they do not have generation in winter evenings.”

2.19.2 Please confirm that energy generated with hydro facilities by customers in the Program does provide capacity benefits, and quantify those benefits.

RESPONSE:

Not confirmed. BC Hydro has not determined the degree to which generation from customers in the Program, either in aggregate or by specific resource type, can be relied upon over the long term. Further, BC Hydro has not determined the degree to which hydro generation from customers in the Program can reliably generate coincident with our system peak.

As discussed in BC Hydro's response to BCUC IR 1.10.2, to-date, BC Hydro has not considered the potential energy contribution from customers in the Program to be sufficiently large to include in our long-term planning. The potential capacity contribution from customers in the Program would be even less than the potential energy contribution.

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19.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 137 – BCUC 1.11.2

BC Hydro's response to BCUC 1.11.2 states in part:

“To provide capacity benefits, BC Hydro requires the resource to be reliably generating when needed which is typically during the system evening peak in the winter. More than 98 per cent of all customers in the Program have solar photovoltaic Generating Facilities. These resources do not provide capacity benefits because they do not have generation in winter evenings.”

2.19.3 Why did BC Hydro's response not identify and discuss those capacity benefits from hydro facilities rather than focusing on solar facilities?

RESPONSE:

BC Hydro's response to BCUC IR 1.11.2 was meant to indicate that any capacity benefits from net generation (outflow) from customers in the Program (which is predominantly solar generation) would be less than any energy benefits delivered to BC Hydro.

As stated in BC Hydro's response to NMRG IR 2.19.2, BC Hydro has not determined the degree to which hydro generation from customers in the Program can reliably generate coincident with our system peak.

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19.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 137 – BCUC 1.11.2

BC Hydro’s response to BCUC 1.11.2 states in part:

“To provide capacity benefits, BC Hydro requires the resource to be reliably generating when needed which is typically during the system evening peak in the winter. More than 98 per cent of all customers in the Program have solar photovoltaic Generating Facilities. These resources do not provide capacity benefits because they do not have generation in winter evenings.”

2.19.4 Why did BC Hydro’s response focus on the number of Net Metering customers (e.g. 98%) rather the percentage of excess generated energy by resource type?

RESPONSE:

BC Hydro’s response to BCUC IR 1.11.2 was meant to indicate that any capacity benefits from net generation (outflow) from customers in the Program (which is predominantly solar generation) would be less than any energy benefits delivered to BC Hydro.

In 2018, significantly more net generation (outflows) was delivered to BC Hydro from customers in the Program with solar generation than from customers in the Program with hydro generation. This is shown in the table below.

This reflects the fact that customers in the Program are able to apply their Generation Account Balance against subsequent bill(s) and receive a Surplus Energy Payment for any remaining balance that exists on their Anniversary Date. Net generation (outflow) is not equivalent to the energy for which a customer receives a Surplus Energy Payment.

Month (Calendar Year 2018)	Generation Delivered from Solar Customers in the Program (MWh)	Generation Delivered from Hydro Customers in the Program (MWh)
January	32	131
February	93	117
March	278	131
April	409	121

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Month (Calendar Year 2018)	Generation Delivered from Solar Customers in the Program (MWh)	Generation Delivered from Hydro Customers in the Program (MWh)
May	804	159
June	660	201
July	911	216
August	716	201
September	495	184
October	362	139
November	118	166
December	55	145
Total	4,933	1,911

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19.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 137 – BCUC 1.11.2

BC Hydro’s response to BCUC 1.11.2 states in part:

“To provide capacity benefits, BC Hydro requires the resource to be reliably generating when needed which is typically during the system evening peak in the winter. More than 98 per cent of all customers in the Program have solar photovoltaic Generating Facilities. These resources do not provide capacity benefits because they do not have generation in winter evenings.”

2.19.5 Do 1.2% of Net Metering customers, comprising 16 hydro plants, produce 80% of the total excess power? If not, provide the correct percentage of excess power produced by those customers.

RESPONSE:

No. In 2018, 28 per cent of the net generation (outflow) from customers in the Program was from customers with hydroelectric facilities (16 customers in total).

To clarify, Surplus Energy Payments do not apply to the total net generation (outflow) received by BC Hydro in a given year. This is because customers in the Program are able to apply their Generation Account Balance against subsequent bill(s) and receive a Surplus Energy Payment for any remaining balance that exists on their Anniversary Date.

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19.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 137 – BCUC 1.11.2

BC Hydro's response to BCUC 1.11.2 states in part:

“To provide capacity benefits, BC Hydro requires the resource to be reliably generating when needed which is typically during the system evening peak in the winter. More than 98 per cent of all customers in the Program have solar photovoltaic Generating Facilities. These resources do not provide capacity benefits because they do not have generation in winter evenings.”

2.19.6 Please confirm that excess power from those Net Metering hydro plants, which makes up the 80% of the total excess power in the Program, has the same firm/long run qualities as BC Hydro's other hydro resources. If not, please explain.

RESPONSE:

Not confirmed.

To clarify, while customers in the Program with hydro Generation Facilities received approximately 80 per cent of the total Surplus Energy Payments in fiscal 2018, they delivered less than 30 per cent of the total net generation (outflow) received by BC Hydro in fiscal 2018. This difference arises from the fact that customers in the Program receive credits for net generation and are able to apply credits in their Generation Account Balance against subsequent bill(s) and receive a Surplus Energy Payment for any remaining balance that exists on their Anniversary Date.

BC Hydro has not determined the degree to which hydro generation from customers in the Program is comparable to run of river resources in BC Hydro's portfolio in terms of firm energy or other long-run qualities.

BC Hydro's heritage assets have flexibility and storage capabilities that provide significant value to BC Hydro ratepayers and are very different from program customer hydro Generating Facilities.

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20.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 143-151 – BCUC 1.12.3 Attachment 1 Table of Total Daily Net Generation Supplied to BC Hydro by NM Customers in 2018

2.20.1 Why do both the graphs and the table in response to BCUC 1.12.3 show no hydro production at all for one day every week in High Load Hours (HLH)?

RESPONSE:

The graphs and the table provided in BC Hydro’s response to BCUC IR 1.12.3 show no hydro production for one day every week in High Load Hours because all hours on Sundays and holidays are considered Light Load Hours.

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20.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 143-151 – BCUC 1.12.3 Attachment 1 Table of Total Daily Net Generation Supplied to BC Hydro by NM Customers in 2018

2.20.2 What is the basis for BC Hydro’s assumption of zero production days each week for hydroelectric generation?

RESPONSE:

Please refer to BC Hydro’s response to NMRG IR 2.20.1.

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21.0 Topic: PRICE OF SURPLUS ENERGY

Reference: Exhibit B-3, PDF 174 – BCUC 1.14.2.

Although the BCUC 1.14.2 was clear in requesting: "Please compare NM customers' generation and consumption patterns as observed by BC Hydro. ***Please include data by rate class and by generation source***, respectively." (emphasis added) the response appears to reflect only the solar profile.

2.21.1 Please provide an additional set of the graphs provided but show only Net Metering hydroelectric excess generation, which accounts for 80% of total Net Metering excess generation.

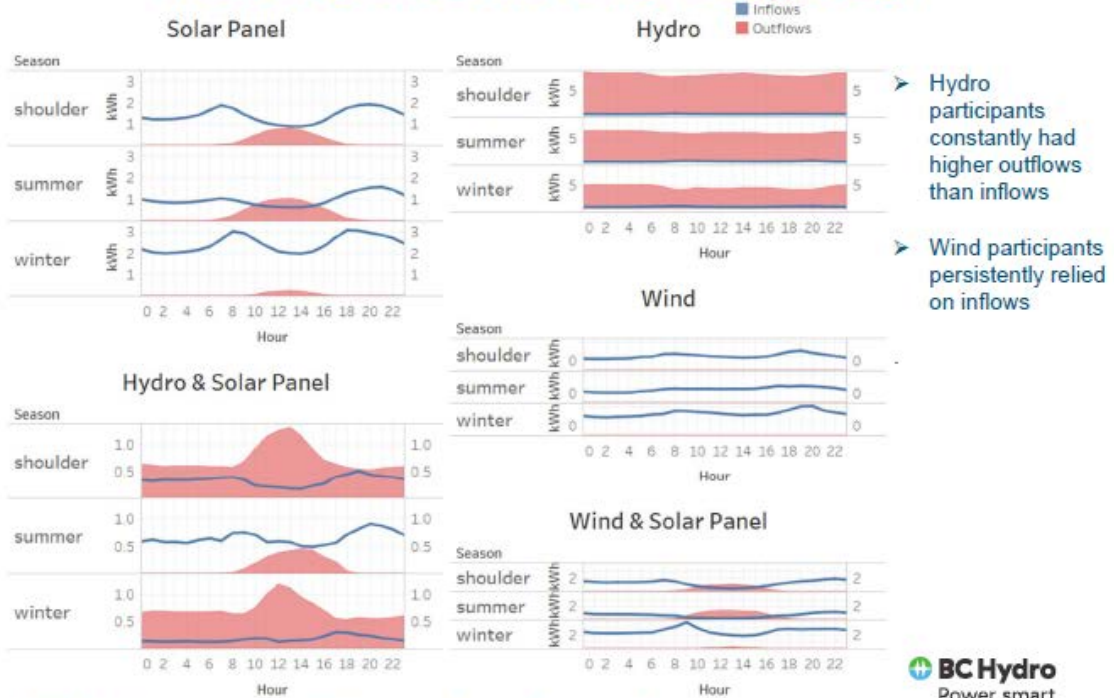
RESPONSE:

Please refer to BC Hydro's response to NMRG IR 2.19.6.

The information provided in BC Hydro's response to BCUC IR 1.14.2 was for all 409 Rate Schedule 1101 customers in the Program that were included in the analysis. This includes both customers with solar generation and with hydro generation.

The graphs below provide the load shapes by generation source for the 409 Rate Schedule 1101 customers in the Program that were analyzed. These load shapes show net consumption (service from BC Hydro to the Customer) and net generation (outflow).

Average Daily Load Shape for Residential Net Metering Customers by Technology



396 PV, 3 Hydro, 1 Hydro & PV, 6 Wind, 2 Wind & PV, and 1 Biogas participants



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22.0 Topic: Price Typically Received by BC Hydro for Net Metering Generation

Reference: Exhibit B-5, PDF 608 – NMRG 1.5.2

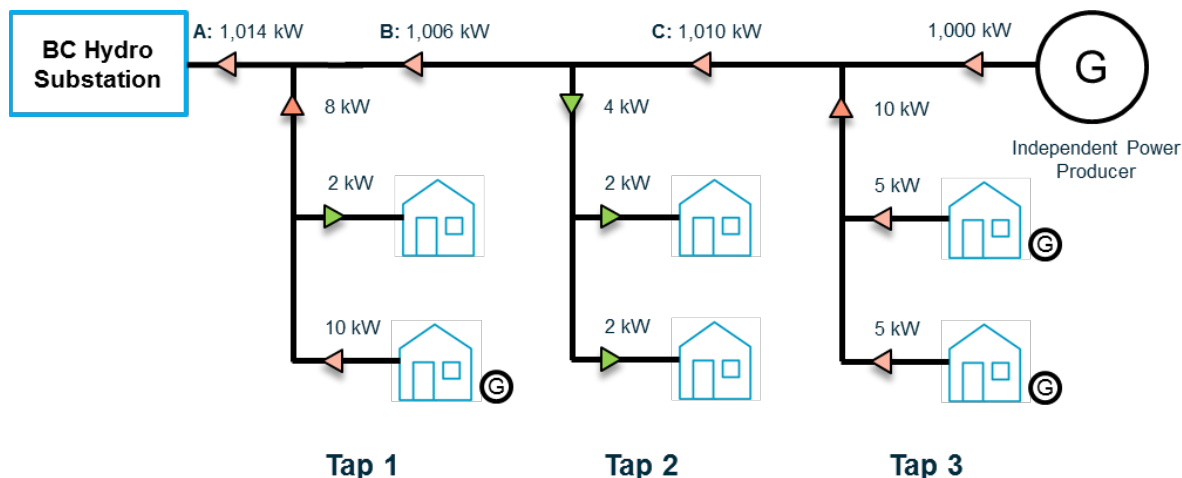
“The flow of electric power on a distribution feeder is governed by system impedances, the amount and location of load on the feeder, and the amount and location of generation on the feeder. The shortest physical distance is not always the shortest electrical distance. As the load and generation is constantly changing, it is not practical to determine the exact path the electric power generated by a customer in the Program takes on the BC Hydro distribution system.”

2.22.1 Please assume an example that shows a typical single distribution line being fed at one end by a BC Hydro substation and at the other end having a Net Metering generator who is producing the average amount of excess energy with 100 houses in between that have a typically average demand load (e.g. 2kw) and that the load is steady as if a snapshot of time were to be taken. Demonstrate in detail with calculations and graphic aids how the flow of power would not flow from the nearest source of generation to the nearest load, including the magnitude of flows from both BC Hydro substation and Net Metering plant to the houses.

RESPONSE:

The following diagram is an illustrative representation of a distribution line. It is not an actual distribution feeder; however, it does represent scenarios that exist on BC Hydro’s distribution system. Demand and generation values are illustrative. For simplicity, system impedance, losses, and reactive power are not included. The diagram shows a snapshot in time.

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Tap 1 consists of a Program customer who has 10 kW of net generation (outflow) and a customer consuming 2 kW. In this case, the energy generated by the Program customer is consumed by their closest neighbour. The excess 8 kW is delivered to the main feeder trunk.

Tap 3 consists of two Program customers who are both producing 5 kW of net generation (outflow). In this case, the energy generated by the Program customer at the end of the line is not delivered to their neighbour at this point in time but instead added to their neighbour's net generation (outflow) and delivered to the main feeder trunk.

Tap 2 consists of two BC hydro customers each consuming 2 kW. The 4 kW is being supplied from the end of the distribution line. BC Hydro does not control or monitor the source of the energy delivered to these two customers. At another point in time, if the Independent Power Producer is out of service and the Program customers are not producing net generation (outflow), then the energy will be delivered to Tap 2 from the BC Hydro substation.

BC Hydro has a smart meter at each customer and a power meter at the Independent Power Producer and the substation. With this information, BC Hydro can estimate the energy consumed by losses and unmetered services (e.g., streetlights, cable power supplies) on the distribution feeder but cannot directly measure the losses associated with each load or energy source.

For example, if there were 30 kW of losses in segment C in the diagram above, BC Hydro cannot directly measure which generating customer is responsible for the losses. Please refer to BC Hydro's response to NMRG IR 2.18.1 where we explain that losses are a system attribute, which are not directly measured but instead estimated through studies and applied against energy sources as part of energy planning and procurement activities.

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22.0 Topic: Price Typically Received by BC Hydro for Net Metering Generation

Reference: Exhibit B-5, PDF 608 – NMRG 1.5.2

“The flow of electric power on a distribution feeder is governed by system impedances, the amount and location of load on the feeder, and the amount and location of generation on the feeder. The shortest physical distance is not always the shortest electrical distance. As the load and generation is constantly changing, it is not practical to determine the exact path the electric power generated by a customer in the Program takes on the BC Hydro distribution system.”

2.22.2 Assume the same scenario described in 22.1 above and provide a map showing distance and the most likely flow of power to meet the most probable typical loads found in a typical residential situation would be served by both typical BC Hydro substation and typical Net Metering customer who is producing excess.

RESPONSE:

Please refer to BC Hydro’s response to NMRG IR 2.22.1.

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23.0 Topic: Not Specified in BCOAPO et al IR

Reference: Exhibit B-5, PDF 224 – BCOAPO et al 1.7.2

BC Hydro claims that it "... does not track Surplus Energy Payments on monthly basis."

2.23.1 Does BC Hydro not track Surplus Energy Payments on a monthly basis by choice or because it is unable to do so. If the latter, please explain in detail why tracking Surplus Energy Payments on a monthly basis.

RESPONSE:

To clarify, BC Hydro does not track Surplus Energy Payments on a monthly basis for individual customers as the Surplus Energy Payment is only calculated at the annual Anniversary Date. However, BC Hydro is able to track Surplus Energy Payments paid out on a monthly basis. The table below provides total Surplus Energy Payments paid out each month in fiscal 2018.

Month	Total Surplus Energy Payments (\$)
Apr-2017	609
May-2017	48,800
Jun-2017	4,773
Jul-2017	13,125
Aug-2017	6,162
Sep-2017	5,330
Oct-2017	71,854
Nov-2017	6,660
Dec-2017	9,374
Jan-2018	31,171
Feb-2018	75,688
Mar-2018	50,812
Total	324,358

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23.0 Topic: Not Specified in BCOAPO et al IR

Reference: Exhibit B-5, PDF 224 – BCOAPO et al 1.7.2

BC Hydro claims that it "... does not track Surplus Energy Payments on monthly basis."

2.23.2 Doesn't calculation of annual Surplus Energy Payments necessarily involve tracking Surplus Energy Payments on a monthly basis? Please explain.

RESPONSE:

Please refer to BC Hydro's response to NMRG IR 2.23.1.

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24.0 Topic: Energy Price

Reference: Exhibit B-5, PDF 294, 296-297 – BCSEA 1.9.1

The response states in part: "BC Hydro has not determined the degree to which aggregate generation from customers in the Program can be relied upon over the long-term and, to date, has not considered the potential energy contribution from customers in the Program to be sufficiently large to include in our long term planning."

2.24.1 Has BC Hydro chosen not to determine the degree to which aggregate generation from customers in the Program can be relied upon over the long-term? If not, could BC Hydro make that determination if directed to by the BCUC? What obstacles may prevent BC Hydro from making that determination?

RESPONSE:

BC Hydro plans to evaluate the degree to which aggregate generation from customers in the Program can be relied upon over the long term through the 2021 Integrated Resource Plan.

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24.0 Topic: Energy Price

Reference: Exhibit B-5, PDF 294, 296-297 – BCSEA 1.9.1

The response states in part: "BC Hydro has not determined the degree to which aggregate generation from customers in the Program can be relied upon over the long-term and, to date, has not considered the potential energy contribution from customers in the Program to be sufficiently large to include in our long term planning."

2.24.2 What potential energy contribution from customers in the Program would BC Hydro consider sufficiently large to include in its long-term planning?

RESPONSE:

BC Hydro has not quantified a specific threshold beyond which the Program would be considered sufficiently large to include in its long term planning.

However, recognizing the declining costs of new customer Generating Facilities and the projected growth of the Program, BC Hydro plans to evaluate the degree to which aggregate generation from customers in the Program can be relied upon over the long term through its upcoming Integrated Resource Plan.

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25.0 Topic: Transitional Provisions

Reference: Exhibit B-5, PDF 317 – BCSEA 1.13.6

BC Hydro states: "The Net Metering Program is not an energy procurement program."

2.25.1 Please confirm that BC Hydro has never promoted the Net Metering Program as an energy procurement program.

RESPONSE:

BC Hydro has not intentionally promoted the Program as an energy procurement program. While customers in the Program may, from time to time, generate more than they consume, the Program was always intended to be a load offset program and was never intended to be an energy procurement program.

In presentations and other communications related to the Standing Offer Program and Micro-Standing Offer Program, the Program was included as a part of an overall offering by BC Hydro for customers generating electricity whether for sale to BC Hydro or to offset their own load. The intent of including the Program in these communications was to demonstrate that net metering was part of a suite of opportunities to generate electricity.

For example, in presentations related to the launch of the Micro-Standing Offer Program in March 2016, BC Hydro provided the following graphic which depicts the suite of programs available from BC Hydro to generators and customers who generate electricity.

At a glance: Micro-Standing Offer Program launch and Standing Offer Program updates

We purchase electricity from small and clean or renewable¹ energy projects throughout B.C. through the following programs:



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1.0 Reference: 1 Introduction and 1.2 Proposed Amendments

DOC_55177_B5-BCH-Response-to-Intervenors-IR1 Responses to SJOMAN Information Request No. 1BCH did not answer the IR correctly, below is a clarification of the IR.

2.1.1 RS 1289 is available to residential and commercial customers, please provide the following for the year ending 31 March 2018 (F2017) and for the year ending 31 March 2019 (F2018):

- Residential customers (**all BCH** accounts):
 - In F2017
 - **Total** Number of **all BCH** residential customers
 - Total revenue from BASIC CHARGE
 - Total revenue from STEP 1 ENERGY CHARGE
 - Total revenue from STEP 2 ENERGY CHARGE
 - In F2018
 - **Total** Number of all BCH residential customers
 - Total revenue from BASIC CHARGE
 - Total revenue from STEP 1 ENERGY CHARGE
 - Total revenue from STEP 2 ENERGY CHARGE
- Commercial customers (all BCH accounts):
 - In F2017
 - **Total** Number of all BCH commercial customers
 - Total revenue from BASIC CHARGE
 - Total revenue from ENERGY CHARGE
 - In F2018
 - **Total** Number of all BCH commercial customers
 - Total revenue from BASIC CHARGE
 - Total revenue from ENERGY CHARGE

RESPONSE:

The tables below provide the requested information for fiscal 2018 and fiscal 2019.

The revenue numbers are provided on a billed sales basis.

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Table 1 – Information for BC Hydro Residential Customers

Fiscal Year	Number of Residential Customers	Total Revenue from Basic Charge (\$ million)	Total Revenue from Step 1 Energy Charge (\$ Million)	Total Revenue from Step 2 Energy Charge (\$ million)
Fiscal 2018	1,803,752	123.2	892.8	899.0
Fiscal 2019	1,833,097	129.9	930.8	895.2

Table 2 – Information for BC Hydro Commercial Customers

Fiscal Year	Number of Commercial Customers	Total Revenue from Basic Charge (\$ million)	Total revenue from Energy Charge (\$ million)
Fiscal 2018	210,673	21.3	1,381.0
Fiscal 2019	212,446	22.7	1,421.0

Note: Commercial customer information includes Light Industrial and Commercial customers.

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**2.0 Reference: 1.5 Net Metering Program Growth,
 2.2 In Fiscal 2018 Surplus Energy Payments, Table 5**

DOC_55177_B5-BCH-Response-to-Intervenors-IR1 Responses to SJOMAN
 Information Request No. 1

BCH declined to fully answer the IR. I don't understand why the town or nearest town is considered confidential. The reason for asking is to get an understanding of the regional distribution of net metering projects.

2.2.1 Please provide the following details for each of the 256 Net Metering customers that got surplus payment (Table 5):

- Town (or nearest town),

RESPONSE:

The public version of the response has been redacted to maintain confidentiality over customer information. BC Hydro will make the un-redacted version of the response available to intervenors with a legitimate interest in seeing it, upon signing the BCUC's form of undertaking.

The table below provides the Town (or nearest town) for each of the customers in the Program who received a Surplus Energy Payment in fiscal 2018.

Town	Number of customers
100 Mile House	█
Abbotsford	█
Agassiz	█
Aldergrove	█
Alert Bay	█
Argenta	█
Birken	█
Bowser	█
Britannia Beach	█
Burnaby	█
Campbell River	█

Town	Number of customers
Charlie Lake	█
Chemainus	█
Chilliwack	█
Clearwater	█
Cobble Hill	█
Coldstream	█
Comox	█
Coquitlam	█
Courtenay	█
Cowichan Bay	█
Cranbrook	█

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Town	Number of customers
Crofton	■
Cumberland	■
Dawson Creek	■
Delta	■
Denman Island	■
Duncan	■
Eagle Bay	■
Edgewood	■
Enderby	■
Engen	■
Errington	■
Fort St. James	■
Fort St. John	■
Gabriola Island	■
Galiano Island	■
Gibsons	■
Gold Bridge	■
Golden	■
Grindrod	■
Halfmoon Bay	■
Hornby Island	■
Houston	■
Hudson's Hope	■
Kamloops	■
Kanaka Bar	■
Kelowna	■
Kimberley	■
Lac La Hache	■
Ladysmith	■
Langley	■
Lumby	■
Madeira Park	■
Masset	■
Mayne Island	■

Town	Number of customers
McLeod Lake	■
Mill Bay	■
Moberly Lake	■
Nakusp	■
Nanaimo	■
New Denver	■
North Saanich	■
North Vancouver	■
Parksville	■
Pemberton	■
Pender Island	■
Pinantan Lake	■
Pitt Meadows	■
Port Alberni	■
Port Coquillam	■
Powell River	■
Prince George	■
Qualicum Beach	■
Queen Charlotte	■
Quesnel	■
Radium Hot Springs	■
Revelstoke	■
Roberts Creek	■
Rosebery	■
Royston	■
Salmon Arm	■
Salt Spring Island	■
Saturna Island	■
Sechelt	■
Sidney	■
Sooke	■
Sorrento	■
Spences Bridge	■
Squamish	■

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Town	Number of customers
Surrey	█
Thetis Island	█
Valemount	█
Vancouver	█
Vernon	█
Victoria	█
West Kelowna	█

Schedule 1

Town	Number of customers
West Vancouver	█
Whistler	█
Williams Lake	█
Wilmer	█
Windermere	█
Winfield	█
Total	249

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3.0 Reference: 2.1 Regulatory History

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As someone who has worked at BCH, a spill event is a notable event and as such is documented. The IR clearly asked about water releases from spillways when the reservoir is full.

2.3.1 From the beginning of the Net Metering Program please provide the following information:

- For every BC Hydro hydro plant with a storage reservoir,
 - When the storage hydro plants released water from the spillways. I.E. when the **reservoir was full** and any **surplus inflow** needed to be **spilled**.
 - Date for start of each spill event at each hydro plant.
 - Duration of each spill event (hours) at each hydro plant.

RESPONSE:

BC Hydro operates and manages its system, including its reservoirs, such that it would generally not be in a position where it was only required to spill due to surplus inflow just when at full pool. Therefore, BC Hydro is unable to identify specific circumstances where spilling would be required under the conditions identified in the question.