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July 23, 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 Information Request No. 1

BC Hydro writes in compliance with BCUC Order No. G-144-19 to provide its responses to BCUC Round 1 information requests (**IRs**) as follows:

Exhibit B-3	Responses to BCUC IRs (Public Version)
Exhibit B-3-1	Responses to BCUC IRs (Confidential Version)

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

Yours sincerely,

Fred James
Chief Regulatory Officer

cs/ma

Enclosure

1.0 A. GENERAL

Reference: GENERAL
Exhibit B-1 (Application), p. 1; Appendix B, pp. 1–2
Effective date of the amended tariff

British Columbia Hydro and Power Authority (BC Hydro) states on page 1 of the Application to Amend Net Metering Service under Rate Schedule 1289 (Application) that “If approved, BC Hydro requests that these amendments be made effective as of the first date of the month following the BCUC’s Order.”

In Appendix B to the Application, BC Hydro includes the following in its revised proposed tariff:

Energy Price:

For all Electricity represented by the Generation Account Balance remaining in the Customer’s Generation Account at any Anniversary Date, BC Hydro will pay:

(a) Customers with an accepted Net Metering Application from April 21, 2018 or later:

a price calculated 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.

(b) Customers with an accepted Net Metering Application from on or before April 20, 2018:

a transitional Energy Price of 9.99 ¢ per kWh. This transitional Energy Price will expire on April 30, 2024. After April 30, 2024, all Customers receiving Service under this Rate Schedule will be paid the Energy Price described in (a), above.

1.1.1 Please clarify what the effective date of the proposed tariff can be (date of the previous application in 2018, date of the current application in 2019, or a month from the date of the order).

RESPONSE:

BC Hydro’s proposed effective date for the proposed tariff is the first date of the month following the BCUC’s Order. The April 2018 date referenced in the

proposed tariff, with regards to the Energy Price, defines customer eligibility for the applicable Energy Price. The Energy Price is the unit price received by a customer for any remaining Generation Account Balance, at the time the customer receives a Surplus Energy Payment from BC Hydro.

As discussed in section 6.1 of the Application, customers whose Net Metering applications were accepted after April 20, 2018 are likely to have minimal Surplus Energy Payments going forward. This is because the April 2018 dates align with the effective date of the amendments to RS 1289 made pursuant to BCUC Order No. G-100-18, which allowed BC Hydro to defer the review of all Net Metering applications proposing a generating facility sized to generate an estimated annual energy output greater than the estimated annual load.

As the proposed amendments in the Application would also not allow oversized generating facilities to participate in the Program, BC Hydro expects that the update to the Energy Price will have a minimal impact to any applications which have been accepted since April 21, 2018. Accordingly, BC Hydro does not believe it is necessary to provide a transitional Energy Price to customers who entered the Program after April 20, 2018.

1.0 A. GENERAL

Reference: GENERAL
Exhibit B-1 (Application), p. 1; Appendix B, pp. 1–2
Effective date of the amended tariff

British Columbia Hydro and Power Authority (BC Hydro) states on page 1 of the Application to Amend Net Metering Service under Rate Schedule 1289 (Application) that “If approved, BC Hydro requests that these amendments be made effective as of the first date of the month following the BCUC’s Order.”

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(a) Customers with an accepted Net Metering Application from April 21, 2018 or later:

a price calculated 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.

(b) Customers with an accepted Net Metering Application from on or before April 20, 2018:

a transitional Energy Price of 9.99 ¢ per kWh. This transitional Energy Price will expire on April 30, 2024. After April 30, 2024, all Customers receiving Service under this Rate Schedule will be paid the Energy Price described in (a), above.

1.1.1 Please clarify what the effective date of the proposed tariff can be (date of the previous application in 2018, date of the current application in 2019, or a month from the date of the order).

1.1.1.1 Please discuss any potential issues by referencing a date in the revised terms that pre-dates: i) the effective date of the tariff, and ii) the date of the Application, respectively.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.1 where we explain why BC Hydro does not believe it is necessary to provide a transitional Energy Price to customers who entered the Program after April 20, 2018.

1.0 A. GENERAL

Reference: GENERAL
Exhibit B-1 (Application), p. 1; Appendix B, pp. 1–2
Effective date of the amended tariff

British Columbia Hydro and Power Authority (BC Hydro) states on page 1 of the Application to Amend Net Metering Service under Rate Schedule 1289 (Application) that "If approved, BC Hydro requests that these amendments be made effective as of the first date of the month following the BCUC's Order."

In Appendix B to the Application, BC Hydro includes the following in its revised proposed tariff:

Energy Price:

For all Electricity represented by the Generation Account Balance remaining in the Customer's Generation Account at any Anniversary Date, BC Hydro will pay:

(a) Customers with an accepted Net Metering Application from April 21, 2018 or later:

a price calculated 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.

(b) Customers with an accepted Net Metering Application from on or before April 20, 2018:

a transitional Energy Price of 9.99 ¢ per kWh. This transitional Energy Price will expire on April 30, 2024. After April 30, 2024, all Customers receiving Service under this Rate Schedule will be paid the Energy Price described in (a), above.

1.1.2 Please explain why the Energy Price that is applicable to existing versus future customers is based on the April 21, 2018 cut-off date, instead of, for example, the date of the Application or the effective date of the revised tariff.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.1 where we explain why BC Hydro does not believe it is necessary to provide a transitional Energy Price to customers who entered the Program after April 20, 2018.

2.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Appendix B, pp. 6–7
Application and interconnection process

Pages 6 to 7 of Appendix B details the Application and Interconnection Approval process.

1.2.1 Please provide a copy of the material provided to potential Net Metering (NM) customers regarding the Application and interconnection approval process and criteria.

RESPONSE:

Attached to this response are copies of the current versions of the following materials provided to potential Net Metering customers regarding the application and interconnection approval process and criteria.

- **Attachment 1 – Simple Generator System Interconnection Application**
- **Attachment 2 – Complex Generator System Interconnection Application**
- **Attachment 3 – Distributed Generation Technical Interconnection Requirements 100 kW and Below (DGTIR-100)**

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Net Metering Program
Simple Generator System Interconnection Application

Net Metering Site Information

This application is for ☐ a new generator ☐ an addition to an existing generator ☐ a replacement of an existing generator

Address:	City:	Postal code:	Site name (if applicable):
Service amperage: A	BC Hydro account #: meter #:		
BC Hydro account holder name (as it appears on the bill):	Account holder telephone:	Account holder email:	
GST # (if the account is on a general service business rate):	Contact name (if the account holder name is a business entity):		

BC Hydro Account Holder Acknowledgement and Privacy Statement

By applying for Net Metering Service (Rate Schedule1289 of the BC Hydro Electric Tariff) you acknowledge that you have read and understand the Net Metering Service requirements and the *Distributed Generation Technical interconnection Requirements – 100kW and Below*, and that you agree to comply with these requirements and design, install, operate and maintain your generator in accordance with applicable governmental and BC Hydro standards and requirements.

The personal information you provide to BC Hydro in support of this application is collected in furtherance of BC Hydro's mandate under the Hydro Power and Authority Act and the Utilities Commission Act and for the purposes of:

1. communicating with you regarding processing and managing of your application, the interconnection of your generator, and the net-metering relationship;
2. providing you with news and information about the net metering program; and
3. inviting you to participate in surveys, questionnaires or other engagement activities on the net metering program.

If you have any questions about the collection of your personal information or its use in connection with this program, please contact the net metering team at net.metering@bchydro.com.

Contractor or Installer Information

Company name (if applicable):	
First name:	Last name:
Telephone:	Email:

Simple Generator System Information

A generator system will be considered as *Simple* if all of the following are met:
- be an inverter-based system and certified to the requirements of CSA C22.2 No. 107.1-01 for utility interconnections
- has an aggregate inverter nameplate output rating (nominal) of 27 kW or less
- has self-contained revenue metering (services 200 A or less; meter codes P261, P263, P264, P960, P963, P967, P968)

Energy source	☐ Wind	☐ Solar	☐ Hydro	☐ Other	Please describe
Installed generator capacity (kW)					

Grid-Tie Inverter Information

Manufacturer:	Model:	Certified under CSA C22.2 No. 107.1-01: ☐ Yes ☐ No	
Number of inverters: X	Nominal output capacity: kW =	Total nominal output capacity: kW	Output voltage: V

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Net Metering Program
Simple Generator System Interconnection Application

Does the generator system include battery storage: ☐ Yes ☐ No

Describe if 'Yes':

Thank you for completing your net metering application.
Please email us your application to net.metering@bchydro.com.

What happens next

1. We review your application and email you our acceptance when all is in order
2. You proceed with the installation of your generator system
3. You email us a copy of the Electrical Inspection Certificate or the electrical contractor's Authorization and Declaration of Compliance when you obtain it
4. We review this document and email you our approval to connect your generator system to the grid *(do not connect your generator system until you are approved)*
5. We arrange to have your BC Hydro account set on the net metering rate

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Net Metering Program
Complex Generator System Interconnection Application

Net Metering Site Information			
This application is for ☐ a new generator ☐ an addition to an existing generator ☐ a replacement of an existing generator			
Address:	City:	Postal code:	Site name (if applicable):
Service voltage: V	Main switch size: A	BC Hydro account #:	meter #:
BC Hydro account holder name (as it appears on the bill):		Account holder telephone:	Account holder email:
GST # (if the account is on a general service business rate):		Contact name (if the account holder name is a business entity):	

BC Hydro Account Holder Acknowledgement and Privacy Statement

By applying for Net Metering Service (Rate Schedule1289 of the BC Hydro Electric Tariff) you acknowledge that you have read and understand the Net Metering Service requirements and the *Distributed Generation Technical interconnection Requirements – 100kW and Below*, and that you agree to comply with these requirements and design, install, operate and maintain your generator in accordance with applicable governmental and BC Hydro standards and requirements.

The personal information you provide to BC Hydro in support of this application is collected in furtherance of BC Hydro's mandate under the Hydro Power and Authority Act and the Utilities Commission Act and for the purposes of:

1. communicating with you regarding processing and managing of your application, the interconnection of your generator, and the net-metering relationship;
2. providing you with news and information about the net metering program; and
3. inviting you to participate in surveys, questionnaires or other engagement activities on the net metering program.

If you have any questions about the collection of your personal information or its use in connection with this program, please contact the net metering team at net.metering@bchydro.com.

Contractor or Installer Information	
Company name (if applicable):	
First name:	Last name:
Telephone:	Email:

Complex Net Metering Distributed Generator System Information					
Energy source	☐ Wind	☐ Solar	☐ Hydro	☐ Other	
Installed generator capacity (kW)					Please describe
☐ Single phase	☐ Three phase	Output voltage: V			

Synchronous, Induction or Inverter-Based Systems

The system is synchronous ☐	or induction ☐	☐ Inverter-based
Complete section A		*Complete section B*

SECTION A - Synchronous or Induction System	
Power factor: %	Subtransient reactance: p.u.
Generator manufacturer:	Generator model:

Version 3.1 April 2017

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Net Metering Program
Complex Generator System Interconnection Application

Protection relay(s) - provide manufacturer, model and function:			
For induction generators only. Applicant declares that the generator is not self-excited: ☐ Yes ☐ No		Power factor correction capacitor size:	kVAR
SECTION B - Inverter-Based System			
Inverter manufacturer:		Inverter model:	
Certified under CSA C22.2 No. 107.1-01: ☐ Yes ☐ No		If 'No', explain:	
Number of inverters: X	Nominal output capacity: kW	= Total nominal output capacity:	kW
Does the system include battery storage: ☐ Yes ☐ No		Describe if 'Yes':	

Additional documentation to include with your application

1. **Single Line Diagram** Please ensure the following details are included:
   - ☐ Project Title; Date; Revision Number; Site Address; Name of Person or Firm that prepared the drawing.
   - ☐ Differentiation between new and existing equipment (cloud or dividing line)
   - ☐ All switches, breakers, and relays shall have distinct identifiers or names.
   - ☐ Service Entrance equipment.
   - ☐ BC Hydro revenue meter and, if applicable, revenue metering instrument transformers and E-Plus Meter.
   - ☐ All electrical equipment between the Service Entrance and the generator (switches, breakers, cables, etc.).
   - ☐ Location of DG Disconnect Means.
   - ☐ Location of warning labels as required by *CEC Part I*.
   - ☐ Generator/Inverter nameplate information and model numbers.
2. **Site Plan** Please ensure the following details are included:
   - ☐ Project Title; Date; Revision Number; Site Address; Name of Person or Firm that prepared the drawing.
   - ☐ Plan view of the site, with nearby roads.
   - ☐ Location of PCC, BC Hydro metering, electrical panels, and generator/inverter.
   - ☐ Location of DG Disconnect Means.
   - ☐ Equipment names, which match the single line diagram.
   - ☐ Site Plan does not need to be to scale.
3. **Additional Documentation** for *Inverter-Based* generators:
   - ☐ Inverter datasheet.
4. **Additional Documentation** for *Induction* or *Synchronous* generators:
   - ☐ Generator data sheet showing nameplate information.
   - ☐ Description of Project Protection and Control System (logic block diagram or narrative).
   - ☐ Description of Protection failure scheme (see 4.2.3 of DGTIR-100).
   - ☐ Protection Single Line Diagram showing: protective relays, relay functions, and protection functions that trip mechanical equipment (such as a protection function failure scheme).
   - ☐ Description of the generator starting sequence (logic block diagram or narrative).

Thank you for completing your net metering application.
Please email us your application to net.metering@bchydro.com.

Distributed Generation
Technical Interconnection Requirements
100 kW and Below
(DGTIR-100)

Revision 1

October 17, 2014

Table of Contents

1 Introduction

BC Hydro provides a means for distribution-connected customers to connect a small energy source to the BC Hydro Distribution System to offset their load and participate in the Net Metering program (RS1289) or other energy procurement offers.

This document contains the technical interconnection requirements for connecting small generators to BC Hydro's Distribution System. The total generation must have an aggregate nameplate rating of 100 kW or less. DGs with generation over this limit should refer to *BC Hydro Interconnection Requirements for Power Generators 35 kV and Below*.

In this document, customers who are connecting a generator are referred to as Distributed Generator (DG) owners. DG owners must obtain approval from BC Hydro to interconnect their generation to the BC Hydro system.

The requirements outlined in this document are intended to:

- ensure the safety of the customer, BC Hydro personnel, and the public;
- maintain reliability and power quality on the Distribution System; and
- establish the range of operating conditions that DGs will encounter.

The aggregate nameplate rating of the generators at the Point of Common Coupling (or point of delivery) shall not exceed the capacity of the customer's existing electrical service. The customer may upgrade their electrical service to meet this requirement, at their cost.

Generators are classified into two categories: **Simple** Distributed Generators and **Complex** Distributed Generators. The technical and application requirements are simplified for Simple DG, while Complex DG are subject to a full review.

How to use this document

1. Confirm the generator can operate within the Distribution System parameters in Section 2;
2. Determine whether the generator is a Simple or Complex DG, based on the criteria in Section 3.1 and Section 4.1;
3. Refer to the applicable interconnection requirements for Simple DG (Section 3.2) or Complex DG (Section 4.2); and
4. Further information on all standards and references referred to in this document can be found in Appendix **A.2**. The titles of all standards and references found in Appendix **A.2** are italicised**.**

1.1 Disclaimers

The information contained in this document is subject to future revisions. Important notes of limitations include:

- this document is not a replacement for electrical codes or other applicable standards
- this document is not intended or provided by BC Hydro as a design specification or as an instruction manual for the DG owner, employees or agents, and the document shall not be used by the proponent, his employees or agents for those purposes. Persons using this information do so at no risk to BC Hydro and they rely solely upon themselves to ensure that their use of all or part of this document is appropriate in the particular circumstance,
- the DG owner, employees or agents recognize that they are, at all times, solely responsible for the generator plant design, construction and operation. BC Hydro, its employees or agents shall not be or become the agent of the proponent in any manner howsoever arising,
- the advice by BC Hydro, its employees or agents, that the generating plant design or equipment meets certain BC Hydro requirements does not mean, expressly or by implication, that all or any of the requirements of the law or good Engineering practice have been met by the owner and such judgement shall not be construed by the owner or others as an endorsement of the design or as a warranty by BC Hydro, its employees and agents, of the design or equipment, or any part thereof.

1.2 Revision History

Date	Revision	Comments
May 31, 2013	0	Major revision. Combined old NMIR/50 kW and NMIR <25 kW and updated to new CSA Standards.
October 17, 2014	1	Renamed document and removed references to Net Metering. Revised Complex DG Size limit to 100 kW and clarified P.Eng. seal requirements for Complex DG systems.

2 BC Hydro Distribution System

Under normal and emergency conditions, BC Hydro's Distribution System exhibits a range of electrical parameter fluctuations. They are summarized in Table 1. The owner must ensure that the DG System can operate satisfactorily under these conditions and protect itself against excursions outside of these parameter ranges.

Table 1 - Distribution System Parameters

Parameter	Typical Value or Reference	Notes and Standards Referencing
System Frequency	60 Hertz (59.7 Hz to 60.2 Hz)	Refer to Clause 5.2.2 of *CSA C22.2 No. 257-06.*
Service Entrance Voltage	Normal Operating Conditions: +4.2 / -8.3 % Extreme Operating Conditions: +6 / -11.5 %	For 1-Phase 120/240 V, 347/600 V Y, 240 V Delta and 480 V Delta. See **Table C.1** - Recommended Service Voltage Variation Limits in Appendix C.
Harmonics	Maximum Voltage Total Harmonic Distortion (THD): < 8% Long Term THD (≥10 min) < 11% Short Term THD (≤3 sec)	Refer to Clause 4.3 of *CAN/CSA C61000-2-2.*
Voltage Flicker	Compatibility levels for severity indices: short-term (10 min), P_{st} = 1.0 long-term (2 hour), P_{lt} = 0.8	Compatibility levels (95 % weekly probability) for flicker in LV systems; 99 % weekly probability values must fall within 1.3× 95 % levels. Refer to Table 1 of *CAN/CSA-C61000-3-7*.
Rapid Voltage Fluctuation	Number of Changes (n) / Voltage Change (%): n ≤ 4/day — 5-6 n ≤ 2/hour & > 4/day — 4 2 < n ≤ 10/hour — 3	Rapid voltage fluctuation on the MV system can become a problem when induction generators are started; voltage rise and fall constitutes 2 changes (n = 2), and higher values may be permissible under abnormal system conditions. Refer to Table 6 of *CAN/CSA-C61000-3-7*.
Voltage Unbalance	When averaged over 10 min, under normal conditions, BC Hydro targets: V_U of <2% for 95% of the time and V_U of <3% for 99.9% of the time.	The voltage unbalance factor (V_U) is approximated by dividing the greatest phase deviation from the mean voltage by the mean voltage. Refer to *CAN/CSA-C61000-4-30-04* for use of symmetrical component ratios for calculation of voltage imbalance. DGs interconnecting with the Distribution System must not create objectionable voltage unbalance. Refer to Clause 7.2.5 of *CAN/CSA-C22.3 No. 9-08*.
Fault Levels	These vary based on circuit configuration and project location.	
System Grounding	3-phase, 4-wire multi-grounded	
Fault and Line Clearing	BC Hydro may use automatic reclosing (re-energizing of the line) on circuit breakers which have been tripped for faults.	The DG System must cease delivering power within 0.16 seconds after de-energization of the Distribution System (unless explicitly accepted by BC Hydro) and not re-energize or synchronize until the Distribution System is Stable. 5 minutes after power restoration.

3 Interconnecting Simple Distributed Generators

3.1 What Qualifies as a Simple Distributed Generator?

For the purposes of this document, a Simple Distributed Generator (DG) system shall meet <u>all</u> of the following:

- be an inverter-based system installed in accordance with *Canadian Electrical Code (CEC) Part I* and **certified** to the requirements of *CSA C22.2 No. 107.1-01* for utility interconnection; and
- has an aggregate nameplate rating of 27 kW or less (30 kVA at 0.9 power factor) at the Point of Common Coupling (or point of delivery); and
- has self-contained revenue metering (services 200 A or less, and not 600V, 3 Phase, 3 Wire, Delta services).

3.2 Requirements

This section provides the technical requirements to be met by any Simple DG System that will be interconnected with the Distribution System.

3.2.1 Equipment

General

As applicable, Simple DG Systems shall meet:

- *CEC Part I (see Sections 50, 64 & 84)*
- *CAN/CSA-C22.2 No. 257-06*
- *CAN/CSA-C22.3 No. 9-08*
- *CSA C22.2 No. 107.1-01*

Point of Common Coupling

The Point of Common Coupling (PCC) is the point where the Distribution System and the DG owner's installation interconnect. This is typically at the weatherhead (for overhead service connections) or at the revenue meter base (for underground service connections). BC Hydro is responsible for design, construction, maintenance, and operation of all facilities on the BC Hydro side of the PCC. The DG owner shall be responsible for design, construction, inspection, maintenance, and operation of all facilities on their side of the PCC.

DG System Disconnect Means

All generators interconnected with the Distribution System require a means to safely disconnect them and ensure isolation in accordance with *CEC Part I*, Section 84. BC Hydro does not specify the physical location of the customer's means of disconnection.

As per *CEC Part I*, Section 84-030, the DG shall install a warning label at the revenue meter location and at the Disconnect Means, and a single-line, permanent, legible diagram of the interconnected system shall be installed in a conspicuous place at the disconnecting means.

3.2.2 Protection

The generator protection shall be in accordance with *CEC Part I* and **Table C.2** in Appendix **C**.

Anti-islanding

The anti-islanding requirements of *CAN/CSA-C22.2 No. 257-06* and *CSA C22.2 No. 107.1-01* requires the inverter to cease energizing the Distribution System within 0.1 seconds upon loss of the BC Hydro supply, as specified in **Table C.3**. This provides for the safety of electrical workers and the public.

Grid-dependent inverters are designed to only energize when the utility (BC Hydro) supply is present, but grid-interactive inverters can also operate in stand-alone (sometimes called off-grid) mode and must be verified to be in grid-dependent mode. A grid-interactive inverter may contain the internal disconnects and transfer switch to ensure isolation from the BC Hydro Distribution System while still supplying an essential load panel. Please see Appendix **A.1** for more detailed definitions.

3.2.3 Power Quality

Inverters certified to the requirements of *CSA C22.2 No. 107.1-01* for utility interconnection meet the power quality requirements for connection to the Distribution System.

3.2.4 Commissioning & Operation

General

The DG owner is required to confirm that all requirements of the manufacturer and Local Regulatory Authority are met, and that the DG System installation meets the requirements of this document and *CSA C22.2 No. 257-06*. If requested, the DG owner will provide to BC Hydro a list of step-by-step energizing and commissioning procedures prior to DG system commissioning.

The DG owner shall retain a complete set of manuals, installation drawings, permits, inspection and verification test reports and make them available to BC Hydro if requested.

Testing & Commissioning

Prior to completion of DG System commissioning, or whenever the generator system is modified, a verification test shall be performed as recommended by the equipment manufacturer and required by *CAN/CSA-C22.2 No. 257-06* Section 7. Testing of the DG System shall include procedures to functionally test all protective elements including verification of inverter trip timing.

Maintenance & Operation

In addition to keeping all equipment well maintained and functional, the DG owner shall verify the generator’s interconnection protective functions according to the manufacturer’s recommended schedule, or at least once a year as required by *CAN/CSA-C22.2 No. 257-06* Section 8. If there is no manufacturer’s recommendation, operation of the disconnecting means and verifying that the inverter system automatically ceases to energize is an acceptable method of verification. Maintenance records shall be maintained. Failure to perform and record maintenance can result in disconnection of the DG facility.

The DG owner must 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 to qualify as a Simple DG.

4 Interconnecting Complex Distributed Generators

4.1 What Qualifies as a Complex Distributed Generator?

The increased complexity and potential for impact on the Distribution System requires that Complex Distributed Generators (DG) be subject to a more rigorous review than Simple DG.

For the purposes of this document, a small generator system will be deemed a Complex DG if it meets any of the following conditions:

- is an inverter-based DG Systems that are not certified to the requirements of *CSA C22.2 No. 107.1-01* for utility interconnection; or
- has an aggregate nameplate rating greater than 27 kW and less than or equal to 100 kW at the Point of Common Coupling (or point of delivery); or
- is an induction or synchronous generator; or
- has instrument transformer revenue metering (services greater than 200 A, or 600V, 3 Phase, 3 Wire, Delta services).

Typically, the main distinction between Simple DG Systems and Complex DG Systems is that for Complex DG Systems the protection and isolation functions are not connected into factory assembled, tested, and certified single enclosure units with non-adjustable settings.

4.2 Requirements

This section provides the technical requirements to be met by any Complex DG System interconnecting with the Distribution System.

Application data requirements for Complex DG Systems are given in Appendix **E**. BC Hydro reserves the right to request that the application documents and drawings be sealed by a Professional Engineer registered in the Province of British Columbia.

4.2.1 Equipment

4.2.1.1 Common Requirements

General

As applicable, Complex DG Systems shall meet:

- *CEC Part I (see Sections 50, 64 & 84)*
- *CAN/CSA-C22.2 No. 257-06*
- *CAN/CSA-C22.3 No. 9-08*
- *CSAC22.2 No. 107.1-01*

Point of Common Coupling – Responsibilities and Quantity Measurement

The Point of Common Coupling (PCC) is the point where the Distribution System and the DG owner's installation interconnect. This is typically at the weatherhead (for overhead service connections) or at the revenue meter base (for underground service connections). BC Hydro is responsible for design, construction, maintenance, and operation of all facilities on the BC Hydro side of the PCC. The DG owner shall be responsible for design, construction, inspection, maintenance, and operation of all facilities on their side of the PCC.

The typical measurement locations of voltage and frequency for protection functions are shown in **Table C.8.**

Point of Disconnection - Safety

All generators interconnected with the Distribution System require a means to disconnect them and ensure isolation in accordance with CEC Part I, Section 84. Typically, BC Hydro does not specify the location of the customer's means of disconnection, except as noted below for instrument transformer metering.

As per *CEC Part I*, Section 84-030, the DG shall install a warning label at the revenue meter location and at the Disconnect Means, and a single-line, permanent, legible diagram of the interconnected system shall be installed in a conspicuous place at the disconnecting means. Where instrument transformers are used for revenue metering, the revenue meter and the instrument transformer enclosure each require a warning label.

According to Section 5 of BC Hydro *Requirements for Secondary Voltage Revenue Metering (750 V and less)*, DG Systems containing instrument transformer metering shall provide a main service box with the customer main disconnect on the supply side of the instrument transformer compartment, and a lockable disconnect on the load side of the instrument transformer enclosure.

DGs with primary metering shall meet the requirements in *Requirements for Manually Read Primary Service Voltage Revenue Metering – 4 kV to 35 kV*.

DG Systems that have potential for hazardous infeed (i.e. can continue to deliver power to the Distribution System after the system has been de-energized for greater than two seconds) require a facility specific Distribution Operating Order (DOO) to be prepared by the BC Hydro Control Centre to describe procedures for interconnected operation. This requirement applies to all synchronous generators and induction generators that are capable of self-excitation.

Voltage Regulation

The DG System shall not attempt to regulate the voltage and shall not adversely affect voltage at the PCC. BC Hydro will determine if voltage regulation is expected to be a concern and identify solutions during the technical review.

Power Factor

The Complex DG System is not required to adjust its power factor (PF) but shall be capable of operating in the range of ±0.90 PF. If the Complex DG causes the Distribution System to operate outside normal voltage levels at the PCC (see **Table C.1 -** for the Distribution System voltage variation limits), then the owner may be required to operate the DG System within a narrower PF range or take other compensatory measures.

Interconnection Grounding

In accordance with *CSA C22.3 No. 9-08*, DG Systems must be grounded as per manufacturer's recommendations and *CEC Part I*. The transformer grounding must be coordinated with BC Hydro to ensure it does not cause voltage disturbances and coordination of ground fault protection is maintained.

Interrupting Device Ratings

The design of the DG System must consider the fault current contributions from both BC Hydro and the DG System, to ensure that all circuit fault interrupters are adequately sized. If requested, BC Hydro will inform the DG owner of the present and anticipated future fault current contribution from the Distribution System at the PCC.

4.2.1.2 Special Requirements: Induction Generators

BC Hydro may require induction generators to provide reactive compensation (PF correction capacitors) to ensure the generator operates within a PF range of ±0.9. Conditions on the Distribution System, as well as the addition of reactive compensation, may increase the potential for self-excitation. If self-excitation is determined to be a credible possibility, mitigation measures will be required by BC Hydro.

4.2.1.3 Special Requirements: Customer Owned Transformers

Customers with a PCC voltage greater than 750 V must provide their own transformer and must connect their DG System to the low voltage side. BC Hydro prefers a transformer connection that is grounded-wye on the high voltage (BC Hydro) side, and a delta on the low voltage (DG System) side, but other configurations with their associated protection schemes may be approved. Please refer to Annex C in *CSA C22.3 No. 9-08* and *BC Hydro Interconnection Requirements for Power Generators 35kV and Below* for further information.

4.2.1.4 Special Requirements: Inverter-based DG Systems

BC Hydro requires that inverter-based DG Systems are **certified** to the requirements of *CSA C22.2 No. 107.1-01* for utility interconnection. At BC Hydro's discretion, a non-certified inverter may be allowed where the inverter is satisfactory to BC Hydro and the DG retains a Professional Engineer who designs, tests and signs off on the inverter system.

4.2.2 Protection – Inverter-Based Systems

The DG System shall be equipped with the required protective equipment outlined in **Table C.2** in Appendix C.

Anti-islanding

The anti-islanding requirements of *CAN/CSA-C22.2 No. 257-06* and *CSA C22.2 No. 107.1-01* require the inverter to cease energizing the Distribution System within 0.1 seconds upon loss of the BC Hydro supply, as seen in **Table C.3**. This provides for the safety of electrical workers and the public.

All inverter-based systems, including those not certified to CSA standards, must meet this anti-islanding requirement.

Overcurrent Protection

The DG System must detect and promptly cease to energize the Distribution System for any phase-to-phase or phase-to-ground overcurrent fault conditions in the DG System.

Under-Voltage and Over-Voltage Protection

Under-voltage and over-voltage protection is required to disconnect the DG System when the Distribution System operates outside of its normal operating range. The under-voltage and over-voltage conditions and pre-set delay times are shown in **Table C.3**.

Single-phase systems shall monitor either the phase-to-neutral or phase-to-phase voltage, based on equipment configuration. Three-phase systems shall monitor all individual phase-to-neutral voltages on a grounded-wye system or any individual phase-to-phase voltage on an ungrounded-wye or delta system. Settings for under- and over-voltage protection outside of the parameters of **Table C.3** will need approval from BC Hydro.

Under-frequency and Over-frequency Protection

Under-frequency and over-frequency protection with adjustable set points is required, to disconnect the DG System, when the Distribution System operates outside of its normal operating range. The under-frequency and over-frequency conditions and pre-set delay times are shown in **Table C.5**.

For three-phase systems, only one phase must be monitored. At least one adjustable under-frequency setting and one over-frequency setting with adjustable clearing time is required.

Synchronization

Inverter-based systems capable of standalone operation must meet the flicker requirements outlined in Section 2 when they synchronize to the Distribution System. The DG System must not re-energize or synchronize to the Distribution System until the BC hydro system is stable.

4.2.3 Protection – Induction and Synchronous Generators

The DG System shall be equipped with the required protective equipment outlined in **Table C.2**. If the protective equipment is compliant with *IEEE Std C37.90-2005*, it does not need to be tested and approved by BC Hydro.

The DG System shall cease energizing the Distribution System without delay when either the protection system or its auxiliary power source fails. The DG owner shall demonstrate that protection system (relay or breaker) failure has been mitigated using self-diagnostic features, redundancy, or fail-safe design.

Anti-islanding

Section 84 of *CEC Part I* requires automatic disconnection of the generator upon loss of voltage on the Distribution System. This provides for the safety of electrical workers and the public. Such anti-islanding protection for DG Systems is provided via the under-/over-voltage and under-/over-frequency protective equipment detailed below.

Scenarios where induction generators might resonate with Distribution System capacitor banks will require instantaneous over-voltage protection.

Overcurrent Protection

The DG System must detect and promptly cease to energize the Distribution System for any phase-to-phase or phase-to-ground overcurrent fault conditions in the DG System.

Under-Voltage and Over-Voltage Protection

Under-voltage and over-voltage protection is required to disconnect the DG System when the Distribution System operates outside of its normal operating range. The required under-voltage and over-voltage conditions and pre-set delay times are shown in **Table C.7**.

Single-phase systems shall monitor the phase-to-neutral or phase-to-phase voltage, based equipment configuration. Three-phase systems shall detect all individual phase-to-neutral voltages on a grounded-wye system, or any individual phase-to-phase voltage on an ungrounded-wye or delta system. Using settings outside of the parameters listed in **Table C.7**.

Under-frequency and Over-Frequency Protection

Under-frequency and over-frequency protection with adjustable set points is required to disconnect the DG System when the Distribution System operates outside of its normal operating range. The under-frequency and over-frequency conditions and pre-set delay times are shown in **Table C.6**. For three-phase systems, only one phase must be monitored. At least one under-frequency setting and one over-frequency setting with adjustable set points and clearing time are required.

Synchronization

Synchronous generators must be equipped with automatic synchronizing capabilities to be connected in parallel with the Distribution System. The DG System may only synchronise when the Distribution System is stable, and must meet the flicker requirements of **Table 1** without causing a voltage variation at the PCC greater than 5%. The synchronization device must be capable of matching the DG System output within 0.3 Hz of the Distribution System frequency, 10% of the Distribution System voltage, and 20 degrees of the Distribution System phase angle.

Induction generators do not require synchronization capabilities since there is no generated voltage prior to connecting to the Distribution System. However, the generator speed should be brought to within 0.5% of its rated value before being connected. Induction generators may be started as induction motors using power from the Distribution System provided they do not cause unacceptable voltage flicker on start-up or on connect/disconnect.

4.2.4 Power Quality

Harmonic Distortion

Complex DG Systems must comply with the limits from *CAN/CSA-C22.3 No. 9-0*, as listed in **Table C.4**. Total current harmonic distortion shall not exceed 5% of rated current.

DC Current Injection

In accordance with Clause 10.5.3 of *CSA C22.2 No. 107.1-01*, DG Systems "shall not inject a DC current greater than 0.5% of the unit rated output current after a period of six cycles" following connection to the Distribution System.

4.2.5 Commissioning & Operation

General

The DG owner is required to confirm that all requirements of the manufacturer, Local Regulatory Authority and applicable standards are met. Installation, commissioning and maintenance must be performed by qualified personnel with the DG keeping signed copies of the commissioning & test reports.

BC Hydro needs to perform field verification for some Complex DG Systems (see **Table D.1** for specifics). Accordingly, the DG owner shall notify BC Hydro at least 10 business days (or 20 business days during the winter period of December to February) before the initial energizing and start-up testing of the DG.

If field verification is required, BC Hydro will provide a Declaration of Compatibility (DoC) that will have to be completed prior to commencing operations (see Appendix F).

Testing & Commissioning

All commissioning tests shall be conducted after the DG System is ready for operation and BC Hydro has approved the protection settings (magnitude and time delay) applied to overcurrent and power quality protection relays. Prior to completion of DG system commissioning, or whenever the generator system is modified, a verification test shall be performed as recommended by the equipment manufacturer.

Verification testing for inverter-based DG shall be done according to *CAN/CSA-C22.2 No. 257-06* (see **Table D.2** for more detail). Verification testing for DG using induction or synchronous generators must be done according to *CSA C22.3 No. 9-08* Section 8 (see **Table D.3** for more detail).

The documentation required by BC Hydro at the commissioning stage is listed in **Table D.4**.

Maintenance & Operation

In addition to keeping all equipment well maintained and functional, the DG owner shall verify the generators protective functions according to the manufacturer's recommended schedule, or at least once a year as required by *CAN/CSA-C22.2 No. 257-06* Section 8 and *CSA C22.3 No. 9-08* Section 8. Maintenance records shall be maintained. Failure to perform and record maintenance can result in disconnection of the DG facility.

The DG owner must notify BC Hydro of any subsequent changes to equipment, by submitting a revised Interconnection Application form.

Appendix A: Definitions and References

A.1 Definitions and Acronyms

Canadian Standards Association (CSA): An accredited standards development organisation within Canada.

Cease to Energize: To stop and remove the capability to deliver electrical power to the Distribution System.

Clearing Time: The time from the start of the abnormal condition to when the Distributed Generation ceases to energize the Distribution System.

Disconnecting Means: A device, group of devices, or other means whereby the conductors of a circuit can be disconnected from their source of supply.

Distributed Generation (DG): Electric power generation facilities connected to the BC Hydro Distribution System through the Point of Common Coupling.

Distributed Generation Owner (DG Owner): Any legal entity responsible for the DG System interconnected to the Distribution System for the purpose of generating electric power.

Distributed Generation System (DG System): The aggregate of the Distributed Generation electricity generator, inverter(s), control system(s), sensing device(s) or function(s), and protection devices and functions to the customer service entrance disconnect switch.

Distribution System: That part of the BC Hydro system that operates at 34,500 V or less and distributes electric power between BC Hydro substations and Points of Common Coupling.

Generator: Equipment that produces electric power. (Note: The inverter is recognized as being a "generator" from the perspective of the Distribution System)

Interconnection: The result of the process of electrically connecting a Distributed Generation System in parallel with the Distribution System.

Interconnection System: The collection of all interconnection equipment, including the utility interconnected inverter, and functions, taken as a group, used to interconnect a Distributed Generator to the rest of the customer's facilities. The interconnection system can be internal to the Distributed Generation System (see Figure B.1).

Inverter: A power electronic device, which converts DC power into AC power.

> **Grid-Tied Inverter** (also known as *Grid-connected Inverter*): An inverter that is able to operate in *grid-parallel mode* (in which an inverter operates in parallel with the Distribution System and contains provision for synchronising its voltage, phase, and frequency to the Distribution System).
>
> **Grid-Dependent Inverter:** A type of *Grid-Tied Inverter* that operates only in *grid-dependent mode* (in which an inverter operating in grid-parallel mode depends on BC Hydro's distribution facility to initiate and maintain its operation). As per *CSA C22.2 No. 107.1-01*, Section 15.3.5.4, a Grid-Dependent Inverter must cease to deliver power within 2 seconds of loss of the grid.
>
> **Grid-Interactive Inverter:** A type of *Grid-Tied Inverter* that is able to operate in both *stand-alone mode* (in which an inverter operates in isolation from BC Hydro's distribution facility, and generates its own voltage, phase, and frequency conditions (i.e. self-commutated) and *grid-*

parallel mode (see "Grid-Tied Inverter" definition) according to the availability of BC Hydro's distribution facility.

Island: A condition in which a portion of the Distribution System is energized by one or more Distributed Generation Systems while that portion of the Distribution System is electrically separated from the rest of the Distribution System.

Local Regulatory Authority: The ministry or local government which provides for an inspection service and has authority to require inspection of electrical work in an area of British Columbia.

Load Ratio: Ratio of the secondary voltage system average load (kVA) of all load customers on the secondary system to the aggregate maximum rated output (kVA) of the Distributed Generation Systems on that secondary system. This does not apply where a dedicated distribution transformer supplies the Distributed Generation customer. This is a measure of the risk of the Distributed Generation Systems for islanding the secondary system if it becomes isolated from the rest of the Distribution System.

Parallel Operation: The simultaneous energization of a Point of Common Coupling by the Distribution System and the Distributed Generation System.

Point of Common Coupling (PCC): The point at which the BC Hydro and the customer interface occurs.

Point of DG Connection: The point where an interconnection system is electrically connected to the DG owner's facility. The point of DG connection can be the same as the Point of Common Coupling (see Figure B.1).

Protection Scheme (or protection system): The protection functions, including associated sensors, relaying, and power supplies, intended to protect the distribution system or interconnection equipment.

Stable or Stabilized: Refers to the Distribution System voltage returning to the normal range of level and frequency for five minutes or a time as co-ordinated with BC Hydro, following a disturbance.

Stiffness Ratio (I_{sc}/I_{load}): Ratio of the Distribution System fault current at the Point of Common Coupling to the aggregate maximum rated output current of the DG System at the customer site. This is a measure of the risk of the DG System causing problems with voltage flicker, steady-state voltage regulation or harmonics.

Total Harmonic Distortion (THD): A measure of the total sum of squares of harmonic frequency signals compared to a fundamental frequency signal.

Utility Grade Relay: Relay having the same quality as those relays used by BC Hydro to protect its system. Utility grade relays are designed to provide the highest degree of reliability, repeatability, longevity, security and calibration accuracy. Such relays meet the performance tests and specifications in *IEEE Std C37.90-2005*.

Voltage Flicker: A variation in Distribution System voltage large enough to be perceived as an objectionable change of intensity from a light bulb.

Voltage Follower Mode: An inverter operation mode that follows the waveform of an external source and depends on the external source to initiate and maintain its operation while delivering power to that source.

Wires Owner (BC Hydro): The legal entity responsible for the Distribution System.

A.2 References

1. BC Hydro, "Electric Tariff."
   http://www.bchydro.com/netmetering
   Note: Rate Schedule 1289 contains details related to Net Metering.

2. BC Hydro, "Interconnection Requirements for Power Generators 35kV and Below." May 2010.
   http://www.bchydro.com/content/dam/hydro/medialib/internet/documents/info/pdf/info_distribution_interconnection_requirements.pdf

3. BC Hydro, "Requirements for Secondary Voltage Revenue Metering (750 V and less)." May 2013.
   https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/accounts-billing/forms-guides/requirements-secondary-72.pdf

4. BC Hydro, "Requirements for Complex Revenue Metering." March 2014
   https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/accounts-billing/electrical-connections/requirements-for-complex-revenue-metering.pdf

5. CAN/CSA-C22.2 No. 257-06, "Interconnecting Inverted-Based Micro-Distributed Resources to Distribution Systems." March 2006.

6. CAN/CSA-C22.3 No. 9-08, "Interconnection of Distributed Resources and Electricity Supply Systems." June 2008.

7. CAN/CSA-C61000-2-2, "Electromagnetic Compatibility (EMC) – Part 2-2: Environment – Compatibility Levels for Low-Frequency Conducted Disturbances and Signalling in Public Low-Voltage Power Supply Systems." November 2004.

8. CAN/CSA-C61000-3-7, "Electromagnetic Compatibility (EMC) – Part 3-7: Limits – Assessment of emission limits for the connection of fluctuating installations to MV, HV and EHV power systems." February 2009.

9. CSA C22.1-12, "Canadian Electrical Code Part 1, Safety Standards for Electrical Installations, 22nd Edition" (With BC Amendments). January 2012. (CEC Part I).
   Link to BC Amendments:
   http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_100_2004#section20

10. CSA C22.2 No. 0-10, "General Requirements – Canadian Electrical Code, Part II, 10th Edition." September 2010. (CEC Part II)

11. CSA CAN-3-C235-83, "Preferred Voltage Levels for AC Systems, 0 to 50,000 Volts, Canadian Utility Distribution Systems." Reaffirmed 2010.

12. CSA Standard C22.2 No. 107.1-01, "General Use Power Supplies." September 2001.

13. IEEE 100, "The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition." December 2000.

14. IEEE Std C37.90-2005, "IEEE Standard for Relays and Relay systems Associated with Electric Power Apparatus." January 2006.

Appendix B: Figures and Single Line Diagrams

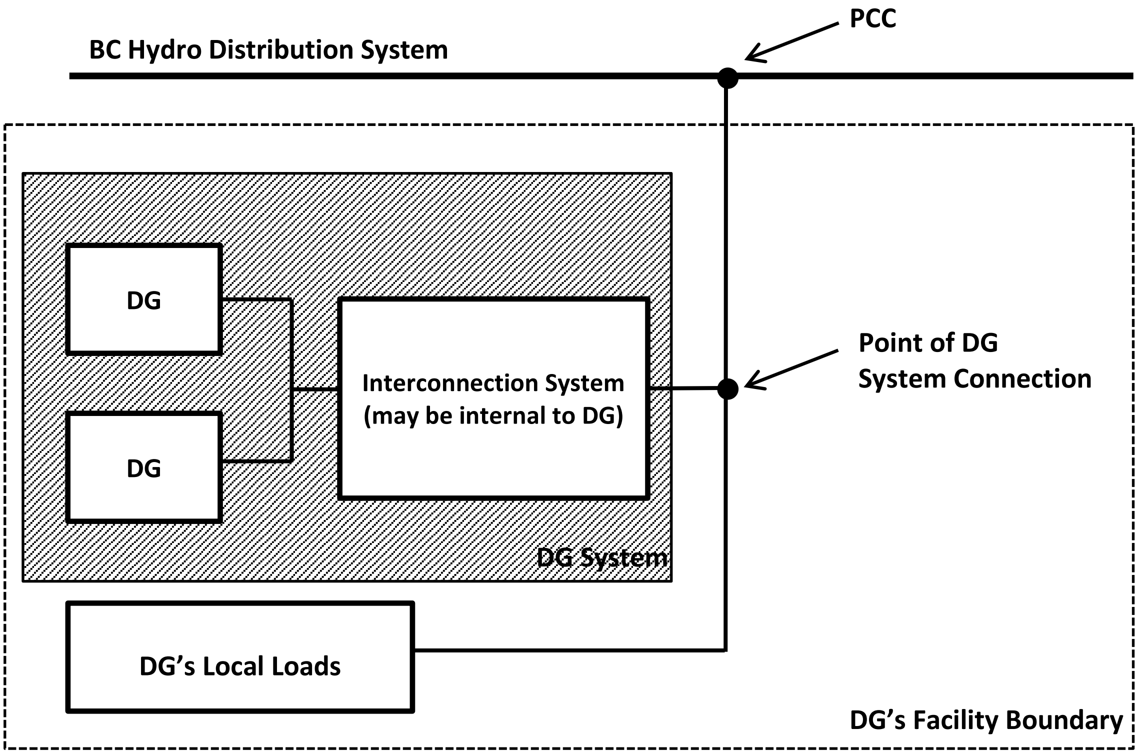

Figure B.1 – Relationship between DG System and Other Interconnection Terms
(Source: Adapted From *CAN/CSA-C22.2 No. 257-06* Figure 1)

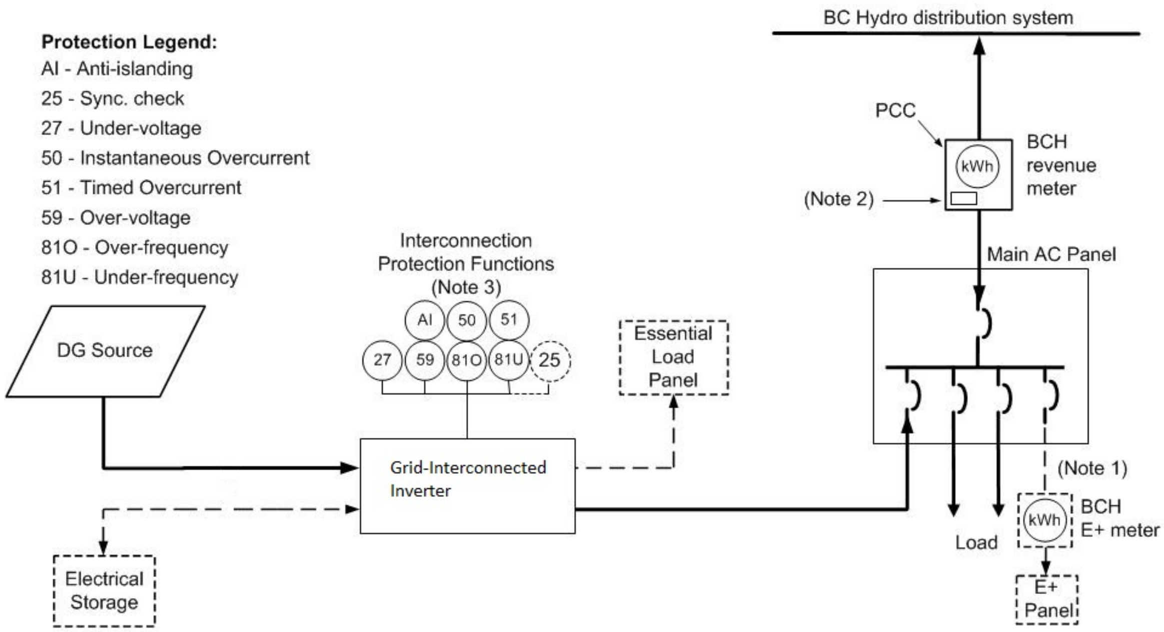

Figure B.2 – Single Line Diagram of a Typical Inverter-Based Simple or Complex DG System (Source: Adapted From *CAN/CSA-C22.2 No. 257-06* Figure B.1)

Notes:

1. Some BC Hydro customers have a separately metered sub panel for electric heating (i.e. E-Plus panel - rate schedule RS 1105). No DG shall be connected to an E-plus panel.
2. This is a warning notice required by Clause 84-030 of the *CEC Part I*. BC Hydro requires that the notice should be a permanent label suitable for outdoor conditions, with black letters on a white background, of a size and wording as indicated in Figure B.4. The notice must be mounted on the meter base (box), or if there is no meter base on the wall within 0.3 m (1 ft) of the meter.
3. Protection functions shown shall be internal for the inverter.
4. Elements shown with dashed line (- - -) are not typical for every installation.

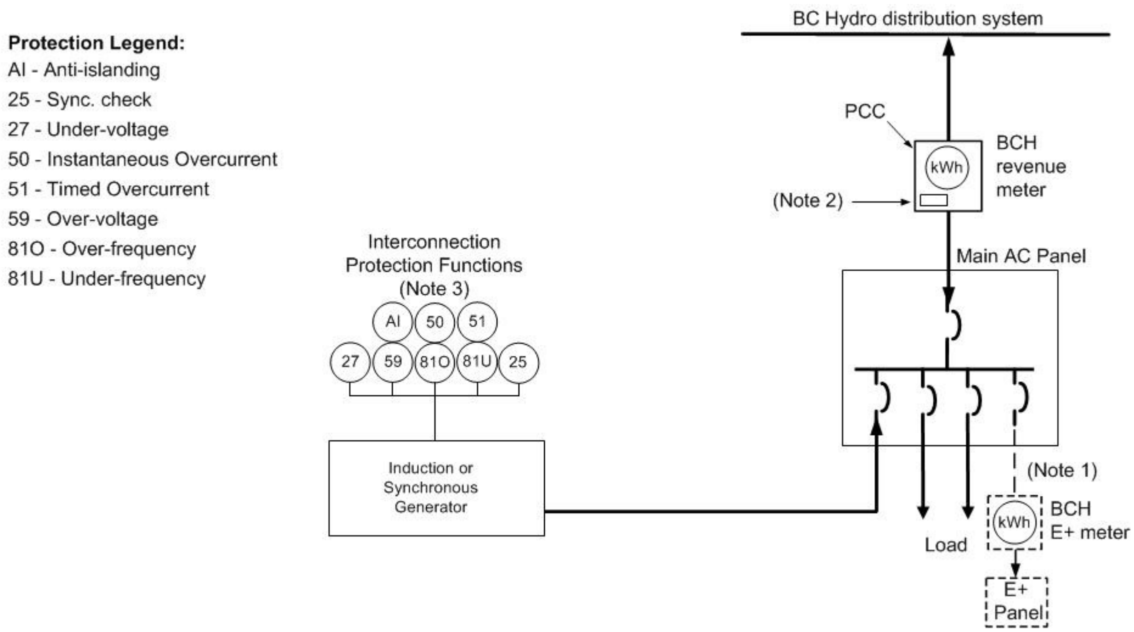

Figure B.3 - Single Line Diagram of a Typical Induction or Synchronous Generator-Based Complex DG System
(Source: Adapted From *CAN/CSA-C22.3 No. 9-08* Figure A.1)

Notes:

1. Some BC Hydro customers have a separately metered sub panel for electric heating (i.e. E-Plus panel - rate schedule RS 1105). No DG shall be connected to an E-plus panel.
2. This is a warning notice required by Clause 84-030 of the *CEC Part I* BC Hydro requires that the notice should be a permanent label suitable for outdoor conditions, with black letters on a white background, of a size and wording as indicated in Figure B.4. In addition, where a DOO is required, an additional label “Potential for hazardous infeed – Refer to DOO” is required. The notice must be mounted on the meter base (box), or if there is no meter base on the wall within 0.3 m (1 ft) of the meter.
3. Protection schematic shown is for typical Complex DG Systems. Refer to Section 4 for requirements on specific systems.

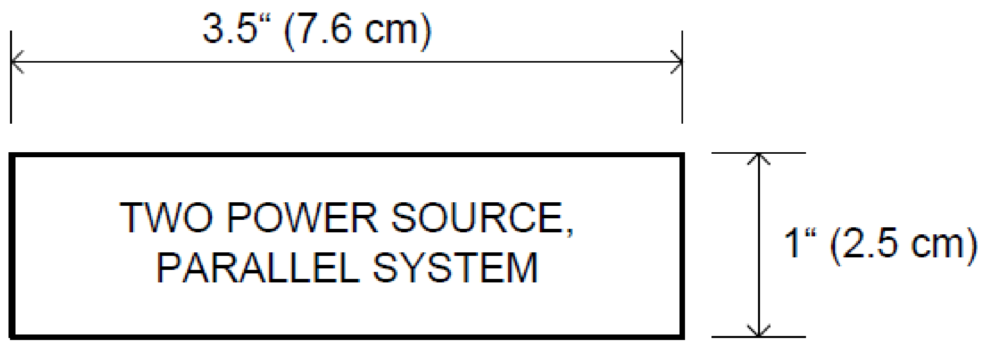

Figure B.4 - Warning Notice at BC Hydro Revenue Meter and Instrument Transformer Cabinet

Appendix C: Technical Tables

Table C.1 - Recommended Service Entrance Voltage Variation Limits
(Source: *CSA CAN-3-C235-83* Reaffirmed 2006 Table 3 and Section 6)

Nominal Voltage (Volts)	Service Entrance Voltage			
	Normal		Extreme	
	Min	Max	Min	Max
1-Phase 120/240	110/220 V	125/250 V	106/212 V	127/254 V
120/208 Y	112/194 V	125/216 V	110/190 V	127/220 V
347/600 Y	318/550 V	360/625 V	306/530 V	367/635 V
240 Delta	220 V	250 V	212 V	254 V
480 Delta	440 V	500 V	424 V	508 V
2400/4160 Grounded Wye	-6%	+6%	-6%	+6%
7200/12,470 Grounded Wye	-6%	+6%	-6%	+6%
14,400/24,940 Grounded Wye	-6%	+6%	-6%	+6%
19,920/34,500 Grounded Wye	-6%	+6%	-6%	+6%

Table C.2 - Interconnection Protection Function Requirements for Inverter-Based DGs
(Source: Adapted from *CAN/CSA-C22.2 No. 257-06* Table D.1)

Function		1 Phase	3 Phase	
			≤ 27 kW	27 kW – 100 kW
52	AC Disconnect Means	Y	Y	Y
	Anti-islanding	Y	Y	Y
25	Automatic Synchronizing[3]	Y	Y	Y
27	Under-voltage Trip	Y	Y(3)	A(3)
59	Over-voltage Trip	Y	Y(3)	A(3)
50	Instantaneous Overcurrent[4]	Y	Y(3)	Y(3)
51	Timed Overcurrent[4]	Y	Y(3)	Y(3)
81/U	Under-frequency Trip	Y	Y	A
81/O	Over-frequency Trip	Y	Y	A

Notes:

1. For interconnection of 1 and 3 phase generation units connected at 600 volts or less in accordance with *CEC Part I.*
   Y = required, not adjustable; A = required, adjustable set points in accordance to **Table C.3** and **Table C.5**.
2. Number of phases monitored shown in parentheses, e.g. (3).
3. For inverters with standalone capability.
4. 50/51 functions may be met by fuses or circuit breaker.

Table C.3 – Inverter-Based DG Response to Abnormal Voltage Levels
(Source: Adapted from *CAN/CSA-C22.2 No. 257-06* Table C.2)

<table>
<tr><th colspan="2">For DG Systems Rated ≤ 27 kW[1]</th><th colspan="2">For DG Systems Rated > 27 kW[1]</th></tr>
<tr><th>Voltage Condition</th><th>Max. Number of Cycles to Disconnect</th><th>Voltage Condition</th><th>Max. Number of Cycles to Disconnect</th></tr>
<tr><td>V < 50%</td><td>6</td><td>V < 50%</td><td>6</td></tr>
<tr><td>50% < V < 88%</td><td>120</td><td>50% ≤ V ≤ 88%</td><td>120</td></tr>
<tr><td>106% < V < 120%</td><td>120</td><td>106% < V < 110%</td><td>Field adjustable trip may be required</td></tr>
<tr><td rowspan="2">V > 120%</td><td rowspan="2">Instantaneous</td><td>110% ≤ V < 120%</td><td>120</td></tr>
<tr><td>V > 120%</td><td>Instantaneous</td></tr>
</table>

Notes:

1. 27 kW was chosen as representing CSA's 30 kVA x 0.9 power factor.
2. The CSA standard allows a wider normal voltage range than **Table C.1** - to allow line regulation equipment time to function. Field adjustable settings for Complex DG Systems may be required to improve protection. Field adjustable settings are to be adjusted by qualified personnel only.

Table C.4 – Maximum Harmonic Current Distortion
(Source: *CAN/CSA-C22.3 No. 9-08* Table 1)

Individual Harmonic Order, h	h < 11	11 ≤ h < 17	17 ≤ h < 23	23 ≤ h < 35	35 ≤ h	Total Demand Distortion
Distortion, Percentage of Current	4.0%	2.0%	1.5%	0.6%	0.3%	5.0%

Notes: The current specified in this Table is the greater of:

a) The Distribution System maximum load current integrated demand (15 or 30 min) without the DG; or
b) The DG unit rated current capacity, transformed at the PCC when a transformer exists between the DG unit and the PCC.

The maximum distortion values specified in this Table are for odd harmonics. To obtain maximum distortion values for even harmonics, the value in the corresponding h-range shall be multiplied by 25%

Table C.5 - Frequency Operating Limits for Inverter-Based DGs
(Source: Adapted From *CAN/CSA-C22.2 No. 257-06* Table C.3)

DG System Capacity	Frequency Range (Hertz)	Number of Cycles to Disconnect
≤ 27 kW	F < 59.5	6
≤ 27 kW	F > 60.5	6
> 27 kW	59.8 - 57	6 - 900
> 27 kW	F > 60.5	6 - 900

Table C.6 - Frequency Operating Limits for Induction and Synchronous DGs
(Source: Adapted from CAN/CSA-C22.3 No. 9-08 Table 2 & 3)

DG System Capacity	Adjustable Set Point, Hz	Clearing Time (Adjustable Set Point)
≤ 27 kW	59.3–57	0.1–2 s
≤ 27 kW	60.7–61.7	0.1–2 s
> 27 kW	59.3-55.5	0.1 – 300 s
> 27 kW	60.7-63.5	0.1 – 180 s

Note: In some cases BC Hydro may specify two over-frequency and under-frequency set points.

Table C.7 - Induction and Synchronous Generator Response to Abnormal Voltage Levels
(Source: Adapted From *CAN/CSA-C22.3 No. 9-08* Table 4)

Voltage Condition at PCC, % of Nominal Voltage[1]	Clearing Time[2,3]
V < 50%	Not to exceed 0.16 s
50% ≤ V < 88%	Instantaneous – 2 s
88% ≤ V < 106%	Nominal Operation
106% < V ≤ 120%	2.0 s
V > 120%	Not to exceed 0.16 s

Notes:

1. Nominal system voltage shall be in accordance with Clause 6.2 of *CAN/CSA-C22.3 No. 9-08.*
2. Specific clearing times within the ranges in this Table may be specified by BC Hydro. Other clearing times or voltage ranges may be arranged through consultation between the DG Owner and BC Hydro.
3. Instantaneous means no intentional delay.

Table C.8 - Typical Measurement Location of Voltage and Frequency for Protection Functions
(Source: References Embedded in Table)

DG System Description	Transformer Winding Configuration at Distribution System Side	Generator Synchronization Location[4]	Point of Measurement[4]	Reference
Inverter-based systems[1]	n/a	n/a	AC Output of Inverter	n/a
Simple DG	n/a	n/a	AC Output of Generator or Inverter	*CAN/CSA-C22.3 No. 9-08* - Section 7.4.1.4
Complex DG Connected at Secondary Voltage	n/a	n/a	AC Output of Generator or Inverter	*CAN/CSA-C22.3 No. 9-08* - Section 7.4.1.4
Connected at Primary Voltage[2,3]	Grounded Wye	Primary Side of Transformer	Primary Side of Transformer	*CAN/CSA-C22.3 No. 9-08* - Fig A.2
Connected at Primary Voltage[2,3]	Grounded Wye	Secondary Side of Transformer	Primary Side of Transformer	*CAN/CSA-C22.3 No. 9-08*- Fig A.3
Connected at Primary Voltage [2,3]	Delta	Primary Side of Transformer	Primary Side of Transformer	*CAN/CSA-C22.3 No. 9-08*- Fig A.4
Connected at Primary Voltage [2,3]	Delta	Secondary Side of Transformer	Secondary Side of Transformer	*CAN/CSA-C22.3 No. 9-08*- Fig A.5

Notes:

BC Hydro may approve exceptions to this table

1. Inverter-based systems generally have built-in protection functions which inherently measure at their AC terminals.
2. Primary Voltage connection is defined as having a voltage greater than 750 V at the PCC.
3. The protection function to detect ground faults on the Distribution System (59G) must measure the primary side of transformer.
4. Primary Side of the transformer is the side connected to the BC Hydro Distribution System.

Appendix D: Testing and Commissioning Tables

Table D.1 – Field Verification Requirements for Complex DG Systems[1]

Size	Inverter-Based & Induction Generators	Synchronous Generators
< 5 kW	Not required	Not required
5 kW to 10 kW	May be required[3]	Required
> 10 kW	Required	Required

Notes:

1. ***Field verification is not required for Simple DG Systems***
2. Field verification for Complex DG Systems is at the discretion of BC Hydro
3. Based on System Stiffness Ratio or Load Ratio
    - Required when System Stiffness Ratio is < 100 for inverter-based Complex DG Systems, < 50 for other Complex DG Systems
    - Required when the Load Ratio is < 2.0

Table D.2 – Testing Summary for Inverter-Based Complex DG Systems
(Source: Adapted from *CAN/CSA-C22.2 No. 257-06* Section 7)

Test Step	Test Procedure
1	Perform all recommended manufacturer testing
2	Functionally test all protective elements including:
2a	- Anti-islanding (including time delay to re-energize)
2b	- Inability to energize dead system
2c	- Under- and over-voltage
2d	- Under- and over-frequency
2e	- Over-current (if applicable)
2f	- Synchronizing controls (if applicable)
3	For battery equipped devices verify that protection settings are stored in non-volatile memory
4	For devices relying on battery power to trip, verify design to be fail-safe by disconnecting the battery and verifying the system ceases to energize the distribution system
5	Confirm all settings (magnitude & delay) are set to the BC Hydro accepted values and protected from changes

Table D.3 – Testing Summary for Complex DG Systems using Induction or Synchronous Generators
(Source: Adapted from *CAN/CSA-C22.3 No. 9-08* Section 8)

Item Number	Requirement
1	Visually confirm that the grounding coordination is compliant with manufacturer and BC Hydro requirements
2	Verify that the disconnecting means configured properly and operational
3	Verify that the polarities, burdens, and ratios of field-wired instrument transformers are correct and according to design
4	Verify that field-installed power and control wiring is in compliance with drawings and manufacturer requirements
5	On three-phase systems, verify that the phase rotation of the distribution system and the DG are compatible
6	Perform calibration checks of each protective relay (or the equivalent)
7	Test functionality of the protective relays (or the equivalent), circuit breakers, and telecommunications to verify that they operate as a system
8	Conduct load tests of protective relays (or the equivalent) immediately after initial energization
9	For DG systems which include a transformer, the ohmic value and connection of the transformer neutral impedance grounding device shall be verified as correct
10	Verify that, upon loss of power supply to the protective relays (or the equivalent), the protection scheme trips the circuit breaker
11	Verify the protective functions which ensure that DG ceases to energize the distribution system under the following conditions
11a	- Under/over voltage
11b	- Under/over frequency
11c	- Protection scheme failure
11d	- Any additional protection functions required for DG systems which include a transformer
12	Voltage flicker (lighting variation visually noticeable? / voltage values & drop during starting)

Table D.4 – Commissioning State Documentation Requirements for Complex DG Systems
(Source: Adapted from *CAN/CSA-C22.2 No. 257-06* Table D.2)

Item Number	Requirement
1	Single Line Diagram indicating protection functions
2	Plot plan with location of disconnecting means and PCC
3	Nameplate information for the generator/source and inverter
4	For inverter-based DG systems, a description of any protection scheme external to the inverter
5	Manufacturer's equipment data sheet
6	Protective function settings
7	Commissioning Report complete with protection settings shown to be set to magnitude and time delays accepted by BC Hydro and protected from changes
8	Photographs of the DG System installation, showing equipment nameplates, disconnect means, revenue meter with warning label and the main AC panel

Appendix E: Application Data Requirements

Applicant Information:

- ☐ Company Name
- ☐ Last Name
- ☐ First Name
- ☐ Phone
- ☐ Email Address
- ☐ Street Address
- ☐ City
- ☐ Postal Code
- ☐ GST # (if applicable)
- ☐ Signature

DG Site Information:

- ☐ Site Name
- ☐ Street Address
- ☐ City
- ☐ Postal Code
- ☐ Service Voltage (V)
- ☐ Service Size (Amps)
- ☐ BC Hydro Account #
- ☐ BC Hydro Meter Number #
- ☐ Is this application for a new Generation System, of a modification of an existing system [New/ Modification]

Contractor or Installer Information:

- ☐ Company Name
- ☐ Last Name
- ☐ First Name
- ☐ Phone
- ☐ Email Address
- ☐ Street Address
- ☐ City
- ☐ Province
- ☐ Postal Code

<u>Information for Simple Distributed Generator Systems:</u>

A project will be considered as a Simple if <u>all</u> the following are met:

- Inverter system certified to the requirements of CSA C22.2 No. 107.1-01 for utility interconnections
- Aggregate generator nameplate rating of 27 kW or less
- Has self-contained revenue metering
- (services 200 A or less, and not 600V, 3 Phase, 3 Wire, Delta services

- ☐ Inverter certified under CSA C22.2 No. 107.1-01 [Y/N]
- ☐ Inverter Manufacturer
- ☐ Inverter Model
- ☐ Inverter Nameplate Capacity (kW)
- ☐ Inverter Output Voltage (V)
- ☐ Number of Phases [Single/Three]
- ☐ Energy Source [Solar/Wind/Hydro/Other(specify)]
- ☐ Installed Capacity of Energy Source (kW)
- ☐ Does the system include Battery Storage [N/Y (specify)]

<u>Information for Complex Distributed Generator Systems:</u>

A project will be considered as a Complex if <u>any</u> of the following are met:

- Inverter-based system not certified to the requirements of CSA C22.2 No. 107.1-01 for utility interconnections
- Aggregate nameplate rating of more than 27 kW
- Induction or synchronous generator
- Has instrument transformer revenue metering

<u>Synchronous or Induction Generator System:</u>

- ☐ Generator Type [Induction/Synchronous]
- ☐ Generator Manufacturer
- ☐ Generator Model
- ☐ Generator Nameplate Capacity (kW)
- ☐ Generator Power Factor (p.f.)
- ☐ Generator Output Voltage (V)
- ☐ Number of Phases [Single/Three]
- ☐ Generator Subtransient Reactance (Xd")
- ☐ Protection Relay(s) (Manufacturer/Model/Functions/Settings)
- ☐ Energy Source [Solar/Wind/Hydro/Wind/Other (specify)]
- ☐ *Induction Generator* – Applicant declares generator is not self-exciting (Y/N)
- ☐ *Induction Generator* – Power Factor Correction Capacitor Size (kVAR)

<u>Inverter-Based System:</u>

- ☐ Inverter certified under CSA C22.2 No. 107.1-01 [Y/N] (If no, explain)
- ☐ Inverter Manufacturer
- ☐ Inverter Model
- ☐ Inverter Nameplate Capacity (kW)
- ☐ Inverter Output Voltage (V)
- ☐ Number of Phases [Single/Three]
- ☐ Energy Source [Solar/Wind/Hydro/Other(specify)]
- ☐ Installed Capacity of Energy Source (kW)
- ☐ Does the system include Battery Storage [N/Y (specify)]

Additional Documentation Required for Complex Distributed Generator Systems:

1. **Single Line Diagram** showing:

- ☐ Project Title, Date, Revision Number, Site Address, Name of Person or Firm that prepared drawing
- ☐ Differentiation between new and existing equipment (Cloud or dividing line)
- ☐ All switches, breakers, and relays shall have distinct identifiers or names
- ☐ Service Entrance equipment
- ☐ BC Hydro revenue meter and, if applicable, revenue metering instrument transformers (CTs and PTs) and E-Plus Meter
- ☐ All electrical equipment between the Service Entrance and the generator (switches, breakers, cables, etc.).
- ☐ Location of DG Disconnect means
- ☐ Location of warning labels as required by *CEC Part I*
- ☐ Generator/Inverter nameplate information and model numbers

2. **Site Plan** showing:

- ☐ Project Title, Date, Revision Number, Site Address, Name of Person or Firm that prepared drawing
- ☐ Plan view of the site, with nearby roads
- ☐ Location of PCC, BC Hydro Metering, Electrical Panels, and generator/inverter.
- ☐ Location of DG Disconnect Means
- ☐ Equipment names, which match the single line drawing
- ☐ Site Plan does not need to be to scale

3. **Additional Documentation**

Induction or Synchronous Generators:

- ☐ Generator data sheet showing nameplate information
- ☐ Description of Project Protection and Control System (Logic block diagram or narrative)
- ☐ Description of Protection failure scheme (See 4.2.3)
- ☐ Protection Single Line Diagram showing: Protective relays, relay functions, and protection functions that trip mechanical equipment (such as a protection function failure scheme)
- ☐ Description of the generator starting sequence (logic block diagram or narrative)

Inverters:

- ☐ Protection Settings
- ☐ Inverter data sheet showing nameplate information and certification to CSA standards

Appendix F: Declaration of Compatibility (DoC)

Declaration of Compatibility, Distributed Generator (Operating), DG Facilities

DG OWNER:

Project:

The DG Owner shall design, construct, own, operate, and maintain the DG Facilities.

Interconnection	Yes	No
1. BC Hydro has reviewed the DG proposed facilities to confirm compliance with BC Hydro's technical interconnection requirements for generator operation.	☐	☐
2. Distribution Operating Order (DOO) approved by BC Hydro and the DG Owner and both have copies. Not required for DGs that cease to deliver power within 2 seconds after de-energization of the AC input line (typically inverters certified to CSA C22.2 No. 107.1-01 **or** induction generators that cannot be self-excited nor excited by the system).	☐	☐
Field Verification		
3. Confirmation by the DG Owner that Electrical Operating Permit and Certificate of Final Inspection has been granted the Local Regulatory Authority, or Electrical Contractor Authorization and Declaration of Compliance Form showing work completed signed by the Field Safety Representative.	☐	☐
4. Confirmation by the DG that the DG facilities have been designed and constructed in accordance with the Application and any amendments specified by BC Hydro.	☐	☐
5. Field Verification completed successfully. Attach Field Verification Checklist	☐	☐
6. Revenue Metering Installation completed.	☐	☐
7. BC Hydro facilities ready.	☐	☐
8. If DOO is required, BC Hydro Real Time Operations approval for generator operation received.	☐	☐

Provide explanation if "No" has been checked for any item above.

The undersigned do hereby declare that the DG is compatible for interconnection with the BC Hydro system for the purpose of generator operation.

______________________	__________	______________________	__________
(DG Owner or Delegate)	Date	*(BC Hydro)*	Date

2.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Appendix B, pp. 6–7
Application and interconnection process

Pages 6 to 7 of Appendix B details the Application and Interconnection Approval process.

1.2.2 Please provide a copy of the complete contractual agreement between BC Hydro and its NM customers.

RESPONSE:

Rate Schedule 1289 represents the complete terms and conditions of the Program. BC Hydro does not enter into a contractual agreement with customers in the Program in addition to Rate Schedule 1289.

Please refer to pages 1 to 12 of Appendix B of the Application for BC Hydro's proposed Rate Schedule 1289 and pages 14 to 26 of Appendix C of the Application for a copy of the current Rate Schedule 1289.

2.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Appendix B, pp. 6–7
Application and interconnection process

Pages 6 to 7 of Appendix B details the Application and Interconnection Approval process.

1.2.3 Please explain whether any material in relation to the Application, interconnection approval process, or the contractual agreement between BC Hydro and its NM customer require revision in light of the proposed changes contained in the Application. If yes, please specify which document(s) will require revision to align with the proposed changes to the tariff.

RESPONSE:

The Simple Generator System Interconnection Application and Complex Generator System Interconnection Application will require revision to align with the proposed changes in the Application. Specifically, BC Hydro will need to add a new field to these documents to provide customers with the option to choose their Anniversary Date. For more information on BC Hydro's proposed changes to allow customers to choose their own Anniversary Date, please refer to section 3.6 of the Application.

2.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Appendix B, pp. 6–7
Application and interconnection process

Pages 6 to 7 of Appendix B details the Application and Interconnection Approval process.

1.2.3 Please explain whether any material in relation to the Application, interconnection approval process, or the contractual agreement between BC Hydro and its NM customer require revision in light of the proposed changes contained in the Application. If yes, please specify which document(s) will require revision to align with the proposed changes to the tariff.

1.2.3.1 Please confirm whether any revision to the material mentioned above will be available as of BC Hydro's proposed effective date of the amended tariff. If not confirmed, please provide a timeline of when the revised material will be available.

RESPONSE:

Confirmed, any revision to the material mentioned in BC Hydro's response to BCUC IR 1.2.3 will be available as of the proposed effective date of the amended tariff.

3.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Section 2.2, p. 17, Appendix F, p. 16
Statistics to date

On page 17 of the Application, BC Hydro provides the following table:

Table 5 Surplus Energy Payments (Fiscal 2018)

Amount Range ($)	Number of Customers	% of Overall Participants	Total Amount in Range ($)	% of Total Surplus Energy Payments
0	1,044	80.31	0	0
≤ 100	103	7.92	3,949	1
>100, < 500	112	8.62	27,789	9
≥ 500, ≤ 1,000	21	1.62	13,396	4
> 1,000, ≤ 6,000	15	1.15	35,652	11
28,000 – 74,000	5	0.38	243,573	75
Total	**1,300**	**100**	**324,358**	**100**

1.3.1 Please provide an updated table with an additional column that shows the generation facility size corresponding to the range of surplus payments.

RESPONSE:

In responding to this question, BC Hydro noticed that there were some minor errors with regards to the breakdown of the number of customers provided in Table 5 in the Application. These errors do not change the total Surplus Energy Payment amount for fiscal 2018 which was $324,358.

The table below provides a corrected breakdown as well as additional columns to show the Generating Facility size corresponding to the range of Surplus Energy Payments in fiscal 2018.

Amount Range ($)	Number of Customers	% of Overall Participants	Total Amount in Range ($)	% of Total Surplus Energy Payments	≤ 5 KW		>5, ≤ 10 kW		>10, ≤ 25 kW		>25, ≤ 50 kW		>50 kW	
					# cust.	($)	# cust.	($)	# cust.	($)	# cust.	($)	# cust.	($)
0	1,079	81.25	0	0	667	0	319	0	71	0	12	0	10	0
≤ 100	96	7.23	4,141	1	71	2901	20	940	5	299	0	0	0	0
>100, < 500	113	8.51	28,251	9	34	6888	56	13,900	22	7,147	1	315	0	0
≥ 500, ≤ 1,000	20	1.51	12,741	4	2	1235	7	4,467	9	5,535	2	1,504	0	0
> 1,000, ≤ 6,000	15	1.13	35,652	11	1	1361	1	1,159	7	14,341	6	18,791	0	0
28,000 – 74,000	5	0.38	243,573	75	0	0	0	0	0	0	2	70,760	3	172,815
Total	**1,328**	**100**	**324,358**	**100**	**775**	**12,385**	**403**	**20,466**	**114**	**27,322**	**23**	**91,368**	**13**	**172,815**

3.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Section 2.2, p. 17, Appendix F, p. 16
Statistics to date

On page 17 of the Application, BC Hydro provides the following table:

Table 5 Surplus Energy Payments (Fiscal 2018)

Amount Range ($)	Number of Customers	% of Overall Participants	Total Amount in Range ($)	% of Total Surplus Energy Payments
0	1,044	80.31	0	0
≤ 100	103	7.92	3,949	1
>100, < 500	112	8.62	27,789	9
≥ 500, ≤ 1,000	21	1.62	13,396	4
> 1,000, ≤ 6,000	15	1.15	35,652	11
28,000 – 74,000	5	0.38	243,573	75
Total	**1,300**	**100**	**324,358**	**100**

1.3.2 Please replicate the table produced in response to the IR above for each generation type (solar PV, hydro, etc.), respectively.

RESPONSE:

In responding to this question, BC Hydro noticed that there were some minor errors with regards to the breakdown of the number of customers provided in Table 5 in the Application. These errors do not change the total Surplus Energy Payment amount for fiscal 2018 which was $324,358.

The tables below provide a corrected breakdown and replicate the additional columns produced in BC Hydro's response to BCUC IR 1.3.1 for Solar PV generation (includes wind, wind and PV and biogas) and for hydroelectric generation.

Solar PV (including wind, wind and PV and biogas)

Amount Range ($)	Number of Customers	% of Overall Participants	Total Amount in Range ($)	% of Total Surplus Energy Payments	≤ 5 KW		>5, ≤ 10 kW		>10, ≤ 25 kW		>25, ≤ 50 kW		>50 kW	
					# cust.	($)	# cust.	($)	# cust.	($)	# cust.	($)	# cust.	($)
0	1,079	81.25	0	0	665	0	318	0	70	0	12	0	10	0
≤ 100	96	7.23	4,141	1	71	2,901	20	940	5	299	0	0	0	0
>100, < 500	113	8.51	28,251	9	32	6,203	56	13,900	22	7,147	1	315	0	0
≥ 500, ≤ 1,000	20	1.51	12,741	4	2	1,235	7	4,467	9	5,535	1	605	0	0
> 1,000, ≤ 6,000	15	1.13	35,652	11	0	0	1	1,159	5	7,301	5	13,093	0	0
28,000 – 74,000	5	0.38	243,573	75	0	0	0	0	0	0	0	0	0	0
Total	**1,328**	**100**	**324,358**	**100**	**770**	**10,339**	**402**	**20,466**	**111**	**20,282**	**19**	**14,013**	**10**	**0**

Hydroelectric

Amount Range ($)	Number of Customers	% of Overall Participants	Total Amount in Range ($)	% of Total Surplus Energy Payments	≤ 5 KW		>5, ≤ 10 kW		>10, ≤ 25 kW		>25, ≤ 50 kW		>50 kW	
					# cust.	($)	# cust.	($)	# cust.	($)	# cust.	($)	# cust.	($)
0	1,079	81.25	0	0	2	0	1	0	1	0	0	0	0	0
≤ 100	96	7.23	4,141	1	0	0	0	0	0	0	0	0	0	0
>100, < 500	113	8.51	28,251	9	2	685	0	0	0	0	0	0	0	0
≥ 500, ≤ 1,000	20	1.51	12,741	4	0	0	0	0	0	0	1	899	0	0
> 1,000, ≤ 6,000	15	1.13	35,652	11	1	1,361	0	0	2	7,040	1	5,698	0	0
28,000 – 74,000	5	0.38	243,573	75	0	0	0	0	0	0	2	70,760	3	172,815
Total	**1,328**	**100**	**324,358**	**100**	**5**	**2,046**	**1**	**0**	**3**	**7,040**	**4**	**77,357**	**3**	**172,815**

3.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Section 2.2, p. 17, Appendix F, p. 16
Statistics to date

On page 16 of Appendix F, BC Hydro provides the following table showing the number of customers with surplus energy, and the total amount of surplus energy purchased by BC Hydro for each year between F2012 and F2016:

	F2012	F2013	F2014	F2015	F2016
Number of customers	13	14	24	63	104
Surplus energy, MWh**	529	763	850	1,651	1,722

** Any excess Energy Credits (surplus energy) at the customer's anniversary date is paid at the Energy Price. The surplus energy purchases would include some energy delivered in the previous fiscal year.

1.3.3 Please provide an update to the above table with the most recently available data.

RESPONSE:

The following table updates the information provided on page 16 of Appendix F of the Application by including the most recently completed fiscal years since fiscal 2016.

	F2012	F2013	F2014	F2015	F2016	F2017	F2018	F2019
Number of customers	**13**	**14**	**24**	**63**	**104**	**168**	**249**[1]	**400**
Surplus energy, MWh	**529**	**763**	**850**	**1,651**	**1,722**	**2,621**	**3,247**	**3,681**

1 **In the Application, BC Hydro indicated that 256 customers received a Surplus Energy Payment in fiscal 2018. BC Hydro clarifies that while 256 Surplus Energy Payments were provided in fiscal 2018, only 249 customers received a Surplus Energy Payment. Seven customers received multiple Surplus Energy Payments because they closed their account and had a Generation Account Balance remaining.**

3.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Section 2.2, p. 17, Appendix F, p. 16
Statistics to date

On page 16 of Appendix F, BC Hydro provides the following table showing the number of customers with surplus energy, and the total amount of surplus energy purchased by BC Hydro for each year between F2012 and F2016:

	F2012	F2013	F2014	F2015	F2016
Number of customers	13	14	24	63	104
Surplus energy, MWh**	529	763	850	1,651	1,722

** Any excess Energy Credits (surplus energy) at the customer's anniversary date is paid at the Energy Price. The surplus energy purchases would include some energy delivered in the previous fiscal year.

1.3.4 For each of the customers who received a payout in F2018, please present the date of enrolment, generation type, generation project size (kW), and the amount of surplus energy and amount of payout ($) in F2015, F2016, F2017, and F2018 (kWh).

RESPONSE:

Attachment 1 to this response provides the requested information.[1]

[1] **In the Application, BC Hydro indicated that 256 customers received a Surplus Energy Payment in fiscal 2018. BC Hydro clarifies that while 256 Surplus Energy Payments were provided in fiscal 2018, only 249 customers received a Surplus Energy Payment. Seven customers received multiple Surplus Energy Payments because they closed their account and had a Generation Account Balance remaining.**

Customers who Received a Surplus Energy Payment in Fiscal 2018

Customer ID	Date of Enrolment	Generation Type	Size (kW)	F2015		F2016		F2017		F2018	
				kWh	$	kWh	$	kWh	$	kWh	$
1	06-Jan-14	Hydro	100	447,356	44,691	461,632	46,117	585,992	58,541	730,816	73,008
2	26-Oct-15	Hydro	100					602,160	60,156	591,540	59,095
3	23-Jun-10	Hydro	50	413,040	41,263	419,220	41,880	412,620	41,221	420,360	41,994
4	31-Jan-12	Hydro	100	34,861	3,483	40,920	4,088	102,246	10,214	407,520	40,711
5	07-Jan-14	Hydro	50	304,208	30,390	328,701	32,837	324,600	32,428	287,929	28,764
6	13-Sep-11	Hydro	50	174,960	17,479	173,920	17,375	139,200	13,906	57,040	5,698
7	19-May-10	Hydro	23	87,149	8,706	75,613	7,554	64,344	6,428	54,839	5,478
8	19-Sep-16	PV	40							44,894	4,485
9	19-Apr-16	PV	24							27,859	2,783
10	14-Oct-15	PV	40					25,490	2,546	25,912	2,589
11	06-Jul-16	PV	32							25,772	2,575
12	12-Jun-15	PV	27					17,118	1,710	18,532	1,851
13	19-Oct-09	PV	40	34,582	3,455	29,279	2,925	5,882	588	15,948	1,593
14	21-Nov-11	Hydro	25	40,172	4,013			11,340	1,133	15,630	1,561
15	19-Oct-04	Hydro	3	26,322	2,630	10,705	1,069	13,105	1,309	13,623	1,361
16	05-Nov-16	PV	24							12,799	1,279
17	05-Jan-17	PV	8							11,604	1,159
18	20-Oct-16	PV	11							11,461	1,145
19	05-Oct-16	PV	16							10,642	1,063
20	20-Jan-17	PV	18							10,320	1,031
21	05-Jul-13	Hydro	45			12,600	1,259			9,000	899
22	10-Mar-12	PV	14	9,678	967	8,357	835	7,736	773	8,159	815
23	19-Jun-15	PV	10					14,493	1,448	7,523	752
24	10-Mar-12	PV	15	4,206	420			13,054	1,304	7,187	718
25	11-Oct-16	PV	6							7,185	718
26	15-Nov-15	PV	5					1,133	113	7,171	716
27	15-Sep-10	PV	9	700	70	6,446	644	6,630	662	6,949	694
28	04-Apr-13	PV	8	8,469	846	8,096	809	7,919	791	6,852	685
29	12-Sep-16	PV	20							6,660	665
30	03-Nov-15	PV	11					8,303	829	6,620	661
31	15-Sep-16	PV	15							6,170	616
32	01-Jun-16	PV	29							6,060	605
33	01-Apr-15	PV	8			2,177	217	7,259	725	5,550	554
34	03-Sep-14	PV	10			8,861	885	5,209	520	5,516	551
35	11-May-12	PV	12	3,984	398	8,769	876	2,658	266	5,264	526
36	05-Oct-15	PV	5			545	54	6,296	629	5,189	518
38	10-Mar-12	PV	14	1,172	117	7,275	727	9,119	911	5,154	515
37	11-Nov-14	PV	14					3,946	394	5,155	515
39	26-Oct-15	PV	6					4,967	496	5,143	514
40	17-Oct-16	PV	11							5,041	504
41	04-Dec-14	PV	12.7			2,795	279	4,400	440	4,974	497
42	25-Mar-15	PV	4					3,165	316	4,950	495
43	17-Jun-16	PV	20							4,808	480
44	01-Oct-12	PV	11.8	3,588	358	6,482	648	6,430	642	4,791	479
45	06-Sep-16	PV	9							4,747	474
46	14-Nov-14	PV	11			7,595	759	5,600	559	4,729	472
47	30-Oct-15	PV	8					1,048	105	4,671	467
48	04-May-15	PV	10					2,202	220	4,634	463
49	22-Nov-16	PV	19							4,594	459
50	14-Aug-15	PV	10			655	65	5,084	508	4,475	447
51	17-Aug-04	Hydro	5	6,304	630	5,080	507	8,434	843	4,432	443
52	18-Jan-17	PV	5							4,418	441
53	08-Sep-15	PV	9					4,280	428	4,357	435
54	08-Sep-16	PV	16.4							4,295	429
55	24-Aug-15	PV	5					4,326	432	4,170	417
56	11-May-12	PV	18	12,772	1,276	4,972	497	8,346	834	4,092	409
57	22-Dec-15	PV	4					3,884	388	4,033	403
58	15-Aug-14	PV	14	994	99	839	84	3,949	395	4,000	400
59	15-Sep-12	PV	5	1,376	137	2,601	260	4,264	426	3,989	399
60	23-Jun-16	PV	7							3,906	390
61	26-Oct-15	PV	10					4,624	462	3,878	387

Customer ID	Date of Enrolment	Generation Type	Size (kW)	F2015		F2016		F2017		F2018	
				kWh	$	kWh	$	kWh	$	kWh	$
62	10-Jan-17	PV	13							3,857	385
63	26-Oct-15	PV	8					5,069	506	3,838	383
64	04-Aug-15	PV	9					3,697	369	3,737	373
65	20-Oct-16	PV	7							3,722	372
66	17-Jun-16	PV	6							3,687	368
67	13-Jul-16	PV	19							3,540	354
68	05-Jul-16	PV	9							3,375	337
69	30-Jun-14	PV	10	5,635	563	3,182	318	3,531	353	3,311	331
70	09-Jan-14	PV	22.8			3,797	379	718	72	3,236	323
71	19-Oct-09	PV	29	12,788	1,278	9,201	919	6,905	690	3,155	315
72	24-May-16	PV	20							3,000	300
73	25-Nov-16	PV	11							2,936	293
74	08-Sep-14	PV	7.7					779	78	2,899	290
75	12-Aug-16	PV	10							2,867	286
76	15-Jul-16	PV	6					1,353	135	2,826	282
77	20-Oct-16	PV	8							2,790	279
78	24-Oct-13	PV	6	3,132	313	3,655	365	3,877	387	2,783	278
79	13-Jun-16	PV	8							2,737	273
80	06-Jul-16	PV	18							2,710	271
81	02-Nov-15	PV	7					3,025	302	2,671	267
83	01-Aug-12	PV	20							2,640	264
82	25-Nov-16	PV	23							2,644	264
84	26-Aug-15	PV	6			379	38	3,283	328	2,628	263
85	22-Jul-16	PV	14							2,621	262
86	12-Aug-15	PV	6					2,137	213	2,582	258
87	24-Sep-15	PV	9.3					2,511	251	2,550	255
88	05-Sep-14	PV	9	625	62	3,131	313	2,734	273	2,537	253
89	10-Nov-16	PV	6							2,521	252
92	17-Dec-15	PV	8					1,687	169	2,509	251
91	19-Sep-14	PV	10					6,265	626	2,511	251
90	12-Aug-15	PV	4					2,084	208	2,514	251
93	09-Nov-12	Hydro&PV	2			1,593	159	5,245	524	2,423	242
94	12-Aug-15	PV	5					1,741	174	2,360	236
95	03-Sep-13	PV	6	2,714	271	2,389	239	2,545	254	2,348	235
96	30-Jun-14	PV	4	645	64	1,774	177	1,496	149	2,235	223
97	08-Sep-14	PV	5.7			2,327	232	2,550	255	2,171	217
98	06-Jul-15	PV	8					3,424	342	2,130	213
99	10-Mar-12	PV	14	8,825	882	4,278	427	1,658	166	2,114	211
100	20-Jun-16	PV	10.5							2,106	210
101	01-Jul-16	PV	10							2,078	208
102	14-Sep-16	PV	6					32	3	2,074	207
103	09-Sep-15	PV	7					2,581	258	2,045	204
104	22-Nov-16	PV	9							2,032	203
105	12-Aug-15	PV	4					2,124	212	1,998	200
106	12-Sep-16	PV	4							1,979	198
108	20-May-15	PV	10			1,657	166	136	14	1,968	197
107	14-Aug-15	PV	4			167	17	1,757	176	1,975	197
109	09-Aug-16	PV	7							1,947	195
110	04-Jul-16	PV	7							1,925	192
111	28-Jun-16	PV	7							1,920	192
112	30-Jun-15	PV	5					1,241	124	1,916	191
113	29-Sep-15	PV	8							1,829	183
114	27-Nov-13	PV	5	2,725	272	2,696	269	1,350	135	1,770	177
116	07-Oct-14	PV	8			2,664	266	2,569	257	1,738	174
115	10-Jun-16	PV	11							1,740	174
118	08-Sep-15	PV	9					1,265	126	1,721	172
117	11-May-12	PV	8	1,069	107	1,929	193	2,862	286	1,722	172
119	10-Jun-15	PV	10					1,940	194	1,711	171
120	22-Jul-13	PV	7					1,379	138	1,682	168
121	04-Aug-16	PV	8							1,663	166
122	16-Jun-15	PV	4			697	70	1,737	174	1,549	155
123	15-Jul-16	PV	10							1,470	147
124	05-Dec-14	PV	7					815	81	1,468	147

Customer ID	Date of Enrolment	Generation Type	Size (kW)	F2015		F2016		F2017		F2018	
				kWh	$	kWh	$	kWh	$	kWh	$
125	16-Sep-13	PV	5			477	48	466	47	1,458	146
126	04-Aug-16	PV	4							1,454	145
127	11-Jul-12	PV	6	1,246	124	1,623	162	1,389	139	1,426	142
128	29-Jun-15	PV	4			163	16	1,191	119	1,414	141
129	05-Dec-13	PV	1	778	78	1,154	115	1,133	113	1,388	139
130	27-Apr-16	PV	6							1,384	138
131	19-Oct-09	PV	6	2,618	262	2,431	243	1,259	126	1,374	137
132	29-Nov-16	PV	5							1,369	137
133	04-Nov-16	PV	3							1,361	136
134	12-Jul-16	PV	7							1,329	133
135	29-Jul-16	PV	7							1,325	132
136	14-Jun-16	PV	3							1,324	132
137	06-Jul-16	PV	5							1,309	131
138	21-Jul-15	PV	6			357	36	2,693	269	1,304	130
139	14-Sep-15	PV	6					1,023	102	1,298	130
140	25-Nov-16	PV	9							1,283	128
142	29-Jun-15	PV	5			269	27	1,491	149	1,268	127
141	28-Jul-14	PV	4	642	64	1,836	183	79	8	1,275	127
143	08-Jul-16	PV	4							1,180	118
144	01-Jul-16	PV	5							1,126	112
145	03-Aug-16	PV	5							1,119	112
146	16-Jul-12	PV	1	1,034	103	1,061	106	1,090	109	1,101	110
147	30-Nov-12	PV	18	1,560	156	1,140	114	420	42	1,080	108
148	26-Jul-07	PV	4	874	87	1,318	132	790	79	1,055	105
149	12-Aug-15	PV	18					4,838	483	1,038	104
151	25-Oct-16	PV	3							1,020	102
150	20-Feb-15	PV	8			2,386	238	1,086	108	1,025	102
152	12-Aug-16	PV	4							1,015	101
153	19-May-15	PV	5			901	90	982	98	1,006	101
154	31-Jan-17	PV	12							996	100
155	01-Jun-15	PV	4					520	52	973	97
156	18-May-16	PV	4							935	93
157	22-Oct-15	PV	5					1,064	106	925	92
158	05-Aug-16	PV	4							882	88
160	14-Oct-15	PV	8					1,012	101	873	87
159	05-Aug-14	PV	6	23	2	1,175	117	884	88	875	87
161	10-Jun-16	PV	4							858	86
162	18-May-16	PV	6					228	23	839	84
163	07-Aug-15	PV	5					279	28	828	83
164	12-Apr-16	PV	8							796	80
165	19-Apr-16	PV	1							784	78
166	25-Nov-16	PV	14							757	76
167	24-Jun-16	PV	3							746	75
168	31-Jul-13	PV	7							745	74
169	30-Jul-10	PV	3.4	900	90	759	76	773	77	742	74
171	24-Sep-15	PV	3					1,404	140	733	73
170	18-Sep-15	PV	4					472	47	734	73
173	28-Jun-16	PV	5							720	72
172	27-Apr-16	PV	5							722	72
174	16-May-13	PV	5			1,488	149	1,253	125	717	72
175	13-Jul-16	PV	6							692	69
176	06-Aug-14	PV	6	590	59	530	53	160	16	686	69
177	21-Jun-16	PV	4							681	68
178	24-Jun-15	PV	3			64	6	510	51	664	66
179	13-Jul-16	PV	3.5							651	65
180	03-Jun-14	PV	5			1,467	147	1,738	174	651	65
181	07-Aug-15	PV	5			133	13			630	63
182	03-Jun-16	PV	5							628	63
183	29-Jul-16	PV	2							619	62
184	16-Jun-15	PV	2			114	11	337	34	599	60
185	30-Jun-15	PV	5			275	27	677	68	595	59
186	12-Aug-16	PV	13							585	58
187	12-Aug-16	PV	5							574	57

Customer ID	Date of Enrolment	Generation Type	Size (kW)	F2015		F2016		F2017		F2018	
				kWh	$	kWh	$	kWh	$	kWh	$
188	01-Sep-12	PV	1	311	31			94	9	571	57
190	24-Jan-12	PV	5	2,091	209	57	6	59	6	563	56
189	09-Aug-16	PV	8							565	56
191	15-Oct-14	PV	5					1,832	183	552	55
192	15-Jul-15	PV	6					453	45	538	54
193	14-May-15	PV	20			1,698	170	34	3	532	53
194	18-May-16	PV	3							524	52
195	09-Jul-09	PV	3	146	15	675	67	343	34	488	49
196	05-Jan-15	PV	2			277	28	89	9	476	48
197	04-Aug-15	PV	3			156	16	427	43	471	47
198	13-Nov-15	PV	6							463	46
199	13-Oct-11	PV	1	688	69	623	62	724	72	459	46
201	23-Jul-15	PV	8							447	45
200	28-Jun-16	PV	5							454	45
202	28-Aug-15	PV	5							426	43
204	20-Jun-16	PV	2							420	42
203	26-Feb-15	PV	2							422	42
205	05-Aug-15	PV	9							391	39
206	14-Aug-13	PV	6							375	37
208	06-Aug-14	PV	6			1,274	127	39	4	357	36
207	06-Aug-09	PV	3.5					587	59	365	36
209	17-May-16	PV	5							356	36
210	25-Jun-13	PV	5	384	38	1,446	144	1,325	132	320	32
211	23-Oct-15	PV	3							312	31
212	23-Jul-15	PV	3			18	2	216	22	277	28
213	05-Jan-17	PV	4							277	28
214	30-Jun-15	PV	2					149	15	273	27
215	08-Jul-16	PV	4							268	27
216	11-Jun-12	PV	3					110	11	259	26
217	30-Aug-16	PV	4							252	25
218	11-May-16	PV	4							252	25
219	15-Jul-15	PV	4			68	7	147	15	240	24
220	11-Jun-15	PV	5			752	75	521	52	206	21
222	27-Jul-15	PV	3					556	56	199	20
221	29-Sep-15	PV	6					286	29	205	20
223	11-May-12	PV	4			191	19	1,876	187	168	17
224	05-Aug-15	PV	6					416	42	164	16
225	30-Mar-16	PV	10							158	16
226	18-Sep-14	PV	4					1,079	108	146	15
228	17-Aug-15	PV	3							139	14
229	12-May-17	PV	6							138	14
227	13-Jul-15	PV	3			29	3	137	14	142	14
231	12-Aug-15	PV	19					111	11	126	13
230	15-May-12	PV	4			91	9			134	13
233	15-Oct-15	PV	2					467	47	108	11
234	12-Aug-15	PV	5							106	11
232	20-Sep-16	PV	3							109	11
237	05-Sep-16	PV	6							97	10
235	24-Sep-15	PV	3							102	10
236	09-Aug-12	PV	3							102	10
238	24-Jun-15	PV	2					24	2	87	9
239	14-Apr-15	PV	4			110	11	170	17	82	8
241	08-May-14	PV	5							66	7
240	13-Aug-09	PV	2	99	10	181	18			72	7
242	18-Jun-12	PV	5			336	34	329	33	52	5
243	30-Jun-15	PV	3			128	13	5	1	38	4
244	03-Jun-16	PV	5							36	4
245	23-Jun-16	PV	3.5							32	3
247	04-Jul-06	PV	1	94	9	308	31	17	2	19	2
246	16-May-16	PV	5							23	2
248	03-Aug-16	PV	3							7	1
249	05-Aug-15	PV	7					495	49	4	0
Total		**249**		**1,668,129**	**$ 166,646**	**1,709,190**	**$ 170,748**	**2,607,315**	**$ 260,474**	**3,246,827**	**$ 324,358**

3.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Section 2.2, p. 17, Appendix F, p. 16
Statistics to date

On page 16 of Appendix F, BC Hydro provides the following table showing the number of customers with surplus energy, and the total amount of surplus energy purchased by BC Hydro for each year between F2012 and F2016:

	F2012	F2013	F2014	F2015	F2016
Number of customers	13	14	24	63	104
Surplus energy, MWh**	529	763	850	1,651	1,722

** Any excess Energy Credits (surplus energy) at the customer's anniversary date is paid at the Energy Price. The surplus energy purchases would include some energy delivered in the previous fiscal year.

1.3.5 Please provide the total number of NM customers, total capacity installed (incremental and cumulative), total energy (kWh) generated, and Surplus Energy (kWh) sold to BC Hydro for each year since the inception of the program to date.

RESPONSE:

The following table provides the total number of customers in the Program, total capacity installed (incremental and cumulative) and Surplus Energy sold to BC Hydro for each year since the inception of the Program. Total energy generated is not provided as BC Hydro does not separately meter customer Generating Facilities and therefore, does not have data on the total energy generated.

Fiscal Year	Total number of customers	Total Capacity Installed (kW)		Number of Customers with Surplus Energy	Surplus Energy (kWh)
		Incremental	Cumulative		
F2005 to F2010	41	122	122	3	Not Available
F2010	64	148	270	4	10,418
F2011	105	227	498	58	57,730
F2012	150	305	803	13	529,181
F2013	225	397	1,200	14	763,023
F2014	301	515	1,716	24	850,319
F2015	419	687	2,403	63	1,681,148
F2016	637	1,391	3,794	104	1,721,713
F2017	923	2,142	5,936	168	2,620,920

Fiscal Year	Total number of customers	Total Capacity Installed (kW)		Number of Customers with Surplus Energy	Surplus Energy (kWh)
		Incremental	Cumulative		
F2018	1,328	3,208	9,143	249[1]	3,246,827
F2019	1,900	4,583	13,726	400	3,681,154

1 In the Application, BC Hydro indicated that 256 customers received a Surplus Energy Payment in fiscal 2018. BC Hydro clarifies that while 256 Surplus Energy Payments were provided in fiscal 2018, only 249 customers received a Surplus Energy Payment. Seven customers received multiple Surplus Energy Payments because they closed their account and had a Generation Account Balance remaining.

3.0 A. GENERAL

Reference: GENERAL
Exhibit B-1, Section 2.2, p. 17, Appendix F, p. 16
Statistics to date

On page 16 of Appendix F, BC Hydro provides the following table showing the number of customers with surplus energy, and the total amount of surplus energy purchased by BC Hydro for each year between F2012 and F2016:

	F2012	F2013	F2014	F2015	F2016
Number of customers	13	14	24	63	104
Surplus energy, MWh**	529	763	850	1,651	1,722

** Any excess Energy Credits (surplus energy) at the customer's anniversary date is paid at the Energy Price. The surplus energy purchases would include some energy delivered in the previous fiscal year.

1.3.6 Please provide the number of NM customer in each rate class as of June 1, 2019.

RESPONSE:

The table below provides the number of customers in the Program, by Rate Schedule, as of June 1, 2019.

Rate Schedule	Number of Customers
1101	1647
1101A	12
1105	20
1107	4
1111	15
1121	2
1151	44
1234	7
1255	5
1300	159
1500	50
1511	1
1600	20

Rate Schedule	Number of Customers
1601	**2**
1610	**16**
1611	**9**
1151/1105	**1**
Total	**2014**

4.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18
Sales of energy by distributed generation customers

On page 18 of the Application, BC Hydro states:

BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use.

1.4.1 Does BC Hydro consider that there are other programs better suited for customers with oversized generation facilities to sell annual excess energy? Please explain.

RESPONSE:

BC Hydro does not currently have any other programs for customers who wish to install Oversized Generating Facilities and sell annual excess generation to BC Hydro. Existing customers in the Program with Oversized Generating Facilities may remain in the Program in accordance with the Program terms.

4.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18
Sales of energy by distributed generation customers

On page 18 of the Application, BC Hydro states:

BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use.

1.4.2 For customers denied access to the NM program due to generation greater than load under the proposed tariff, do those NM customers currently have the option to participate in other programs that facilitate distributed generation?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.4.1 where we state that BC Hydro does not currently have any other programs for customers who wish to install Oversized Generating Facilities and sell annual excess generation to BC Hydro.

5.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18; Order G-5-17, Appendix A, pp. 2, 34
Cost-shifting to non-participants

Page 2 of Appendix A to Order G-5-17[1] states that BC Hydro includes the following approval sought in its BC Hydro 2015 Rate Design Application:

Effective April 1, 2017, a one-time increase to RS 13xx basic charge that would allow the basic charge to recover approximately 45 percent of BC Hydro's customer-related costs attributable to the Small General Service (SGS) rate class in the F2016 Cost of Service (COS) study, and a one-time offsetting decrease in the energy rate to maintain forecast revenue neutrality based on the SGS revenue target calculated using any applicable rate increases arising from the F2017 Revenue Requirements Application.

The above approval was approved as explained on page 34 of Appendix A to Order G-5-17.

On page 18 of the Application, BC Hydro states:

Further, BC Hydro believes that Surplus Energy Payments ranging from $28,000 to $74,000 are unfair to non-participating customers, go far beyond any limited cost-shifting that may be warranted to support the Program and over time, if not addressed, could represent a substantial cost to BC Hydro and to all customers.

1.5.1 Please 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.

RESPONSE:

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.

1 https://www.bcuc.com/Documents/Proceedings/2017/DOC_48618_01-20-2017_G-5-17_BCH-2015-RDA-Decision-WEB.pdf.

Once every 12 months, if customers in the Program have credits remaining at their Anniversary Date, they receive a Surplus Energy Payment from BC Hydro for those remaining credits at the Energy Price. If the Energy Price paid to the customer is greater than the value BC Hydro receives from excess generation, then BC Hydro does not fully recover its costs and there is cost shifting to non-participating customers. The proposed amendments to RS 1289 will mitigate the cost shifting associated with Surplus Energy Payments and will more accurately reflect the value of that energy to BC Hydro. Please refer to BC Hydro's response to BCUC IR 1.12.4 where we explain how the average Mid-C price more appropriately reflects the value of energy from customers in the Program.

Cost-shifting between customers in the Program and non-participating customers also occurs in the following ways that are not addressed through the proposed amendments in the Application.

- **Net Metering Customers Still Require Energy on Demand: As discussed in section 9.1.2 of the Evaluation Report (Appendix F of the Application), most of BC Hydro's costs to serve customers in the Program are recovered through volumetric energy charges. This type of rate design causes cost shifting from participating customers to non-participating customers because participating customers still require energy from BC Hydro on demand but typically have lower load factors compared to non-participants. Volumetric energy charges may not be adequate to recover demand-related costs for low load factor customers. As stated in section 7.3 of the Application, this means that while both participating and non-participating customers depend on BC Hydro's ability to supply them with the electricity they require at any point in time, non-participating customers pay relatively more for this service, compared to Program participants.**
- **Net Metering Customers Accumulate a Generation Account Balance to Reduce Subsequent Bill(s): When customers in the Program generate more electricity than they need at a point in time, that surplus electricity is recorded in the Customer's Generation Account. The Generation Account Balance is then applied as a credit to offset electricity consumption later, when customers do not generate enough electricity to meet their needs and require electricity from BC Hydro. Therefore, generally speaking, when the rate that would have been charged to the customer under their applicable Rate Schedule for any offset consumption is greater than the average Mid-C price, cost shifting from customers in the Program to non-participating customers occurs.**

BC Hydro may include amendments to further improve cost recovery from customers in the Program in future applications.

5.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18; Order G-5-17, Appendix A, pp. 2, 34
Cost-shifting to non-participants

Page 2 of Appendix A to Order G-5-17[1] states that BC Hydro includes the following approval sought in its BC Hydro 2015 Rate Design Application:

Effective April 1, 2017, a one-time increase to RS 13xx basic charge that would allow the basic charge to recover approximately 45 percent of BC Hydro's customer-related costs attributable to the Small General Service (SGS) rate class in the F2016 Cost of Service (COS) study, and a one-time offsetting decrease in the energy rate to maintain forecast revenue neutrality based on the SGS revenue target calculated using any applicable rate increases arising from the F2017 Revenue Requirements Application.

The above approval was approved as explained on page 34 of Appendix A to Order G-5-17.

On page 18 of the Application, BC Hydro states:

Further, BC Hydro believes that Surplus Energy Payments ranging from $28,000 to $74,000 are unfair to non-participating customers, go far beyond any limited cost-shifting that may be warranted to support the Program and over time, if not addressed, could represent a substantial cost to BC Hydro and to all customers.

1.5.2 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.

RESPONSE:

The following response provides the requested analysis as follows:

- **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;**

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1 https://www.bcuc.com/Documents/Proceedings/2017/DOC_48618_01-20-2017_G-5-17_BCH-2015-RDA-Decision-WEB.pdf.

- **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.

As discussed in BC Hydro's response to BCUC IR 1.5.1, the proposed amendments in the Application are specifically intended to only address the cost-shifting that occurs with regards to Surplus Energy Payments. BC Hydro is not proposing any amendments in the Application to address cost-shifting that occurs in the other ways discussed in BCHydro's response to BCUC IR 1.5.1 and quantified in this response.

<u>Illustrative Bills – Residential RS 1101 Customer</u>

Table 1 below provides an illustrative bill for a Residential (RS 1101) customer with average consumption that is not participating in the Program. As shown, the total annual bill is $1,085.

Table 1 Energy Usage and Bills for Average Consumption Residential (RS 1101) Customer

(A) Month	(B) Consumption (kWh)	(C) Billed Consumption (kWh)[2]	(D) Total Bill ($)[3]
April	885	1,694	189
May	809		
June	636	1,241	130
July	604		
August	610	1,233	129
September	623		
October	645	1,409	149

[2] **Bi-monthly billing is used as this is most common for Residential customers.**

[3] **Fiscal 2020 Interim Approved RS 1101 rates inclusive of Basic Charge and Energy Charges.**

(A) Month	(B) Consumption (kWh)	(C) Billed Consumption (kWh)[2]	(D) Total Bill ($)[3]
November	763		
December	913	2,084	245
January	1,170		
February	1,094	2,080	243
March	985		
Total	9,739	9,739	1,085

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.

Figure 1 Residential (RS 1101) Net Generation Outflow Pattern

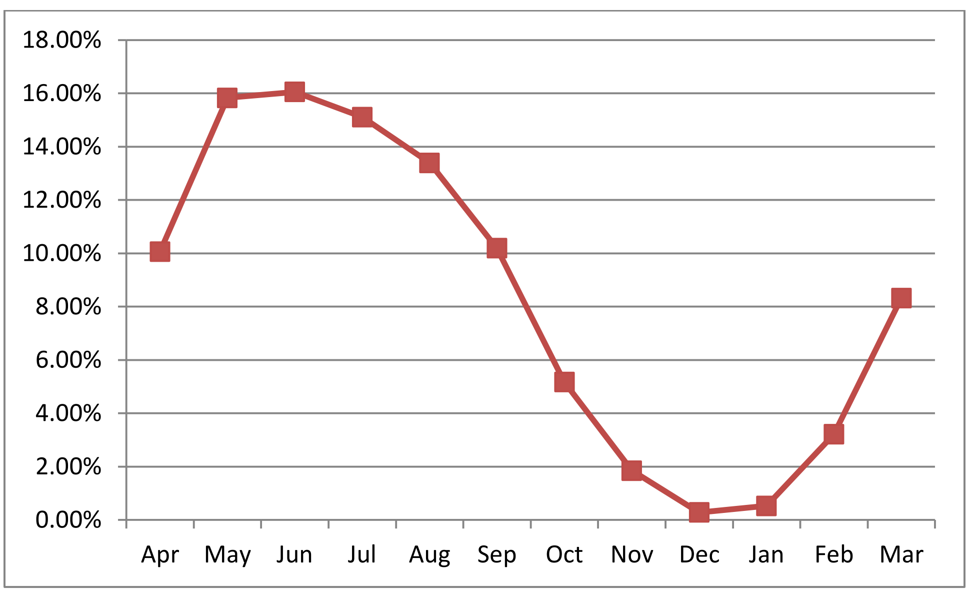

Table 2 below provides an illustrative bill for a Residential customer in the Program with average consumption who offsets 50 per cent of that consumption over the year.

As shown, the annual bill for this illustrative customer is $577, compared with the annual bill for the non-participant of $1,085, as shown in Table 1.

Table 2 Energy Usage and Bills for an Average Consumption RS 1101 Customer who Offsets 50 per cent of their Annual Consumption

(A) Month	(B) Percentage of Total Annual Generation (%) (Refer to Figure 1)	(C) Consumption (kWh) (Table 1 Column B)	(D) Generation (kWh) D = 4,870 * B[4]	(E) Monthly Net Energy (kWh) E = C-D	(F) Billing Period Net Energy (kWh)[5]	(G) Billed Energy (kWh)[6]	(H) Total Bill [7] ($)
April	10	885	490	395	433	433	54
May	16	809	771	38			
June	16	636	782	(145)	(277)	0	13
July	15	604	736	(131)			
August	13	610	652	(42)	85	0	13
September	10	623	496	127			
October	5	645	252	393	1,067	875	95
November	2	763	90	673			
December	0	913	14	900	2,044	2,044	239
January	1	1,170	26	1,145			
February	3	1,094	156	938	1,518	1,518	164
March	8	985	405	580			
Total	100	9,739	4,870	4,870	4,870	4,870	577

Table 3 below provides an illustrative bill for a Residential customer in the Program with average consumption who offsets 100 per cent of that consumption on an annual basis. As shown, the annual bill for this illustrative customer is $76, compared to

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4 **Where 4,870 is calculated as 50 per cent of annual consumption. Note that results may not exactly match due to rounding.**

5 **As RS 1101 customers are billed bi-monthly, results are summed over two months. A negative value in column G indicates that the customer generated more than their usage in the period resulting in a credit to their Generation Account Balance that is applied to offset bills in future billing periods.**

6 **Billed energy is either: a) net energy in billing period, if this value is positive, b) zero, if net energy is negative; or c) net energy less the accumulated Generation Account Balance.**

7 **Fiscal 2020 Interim Approved RS 1101 rates inclusive of the Basic Charge and Energy Charges. As there is no Generation Account Balance at the end of the year, the RS 1289 Energy Price is not applicable.**

$577 for the illustrative customer who offsets 50 per cent of consumption as shown in Table 2, and $1,085 for the non-participant, as shown in Table 1.

Table 3 Energy Usage and Bills for an Average Consumption RS 1101 Customer who Offsets 100 per cent of their Annual Consumption

(A) Month	(B) Percentage of Total Annual Generation (%) (Refer to Figure 1)	(C) Consumption (kWh) (Table 1 Column B)	(D) Generation (kWh) D = 9,739 * B[8]	(E) Monthly Net Energy (kWh) E = C-D	(F) Billing Period Net Energy (kWh)[9]	(G) Billed Energy (kWh)[10]	(H) Total Bill ($)[11]
April	10	885	980	(95)	(828)	0	13
May	16	809	1542	(733)			
June	16	636	1563	(927)	(1,794)	0	13
July	15	604	1472	(867)			
August	13	610	1304	(694)	(1,064)	0	13
September	10	623	992	(369)			
October	5	645	504	142	725	0	13
November	2	763	180	583			
December	0	913	27	886	2,005	0	13
January	1	1,170	52	1,119			
February	3	1,094	313	782	957	0	12
March	8	985	810	175			
Total	100	9,739	9,739	0	0	0	76

Illustrative Bills – Small General Service RS 13xx Customer

Table 4 below provides an illustrative bill for a Small General Service (RS 13xx) customer with average consumption that is not participating in the Program. As shown, the total annual bill is $2,877.

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8 **Where 9,739 is calculated as 100 per cent of annual consumption. Note that results may not exactly match due to rounding.**

9 **As RS 1101 customers are billed bi-monthly, results are summed over two months. A negative value in column G indicates that the customer generated more than their usage in the period resulting in a Generation Account Balance that is applied to offset bills in future billing periods.**

10 **Billed energy is always zero as 100 per cent of consumption is offset.**

11 **Fiscal 2020 Interim Approved RS 1101 Basic Charge. Energy charges do not apply as billed energy is zero. As there is no Generation Account Balance at the end of the year, the RS1289 Energy Price is not applicable.**

Table 4 Energy Usage and Bills for Small General Service (RS 13xx) Customer with Average Consumption

(A) Month	(B) Monthly Consumption (kWh)	(C) Billing Period Consumption (kWh)	(D) Total Bill ($)[12]
April	1,765	3,721	488
May	1,956		
June	1,572	3,288	434
July	1,716		
August	1,630	3,421	451
September	1,791		
October	1,585	3,308	437
November	1,723		
December	1,827	4,099	536
January	2,272		
February	2,046	4,059	530
March	2,013		
Total	21,897	21,897	2,877

Figure 2 below shows the actual net generation (outflow) pattern of 45 Small General Service (RS 13xx) Net Metering customers in fiscal 2016. As shown, these outflows have high seasonal variability, peaking in spring and approaching zero in winter. Therefore, it would not be meaningful to estimate bills for hypothetical 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 2 below.

[12] **Fiscal 2020 Interim Approved RS 13xx Rates**

Figure 2 Small General Service (RS 13xx) Net Generation Outflow Pattern

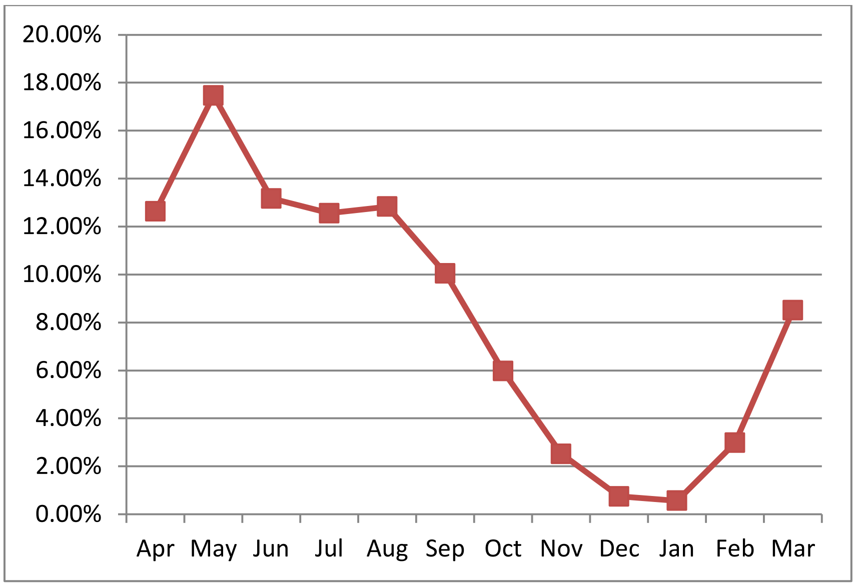

Table 5 below provides an illustrative bill for a Small General Service (RS 13xx) customer in the Program with average consumption who offsets 50 per cent of that consumption over the year. As shown, the annual bill for this illustrative customer is $1,505, compared with the annual bill for the non-participant of $2,877, as shown in Table 4.

Table 5 Energy Usage and Bills for an average Small General Service (RS 13xx) Customer who Offsets 50 per cent of their Annual Consumption

(A) Month	(B) Percentage of Total Annual Generation (%) (Refer to Figure 2)	(C) Consumption (kWh) (Table 4 column B)	(D) Generation (kWh) D = 10,948 * B [13]	(E) Monthly Net Energy (kWh) E = C-D	(F) Billing Period Net Energy (kWh) [14]	(G) Billed Energy (kWh) [15]	(H) Total Bill ($)[16]
April	13	1,765	1,383	382	426	426	76
May	17	1,956	1,913	44			
June	13	1,572	1,442	130	471	471	81
July	13	1,716	1,375	341			
August	13	1,630	1,405	226	916	916	137
September	10	1,791	1,100	691			
October	6	1,585	654	931	2,379	2,379	320
November	3	1,723	276	1,447			
December	1	1,827	82	1,744	3,954	3,954	518
January	1	2,272	62	2,210			
February	3	2,046	326	1,720	2,801	2,801	372
March	9	2,013	932	1,081			
Total	100	21,897	10,948	10,948	10,948	10,948	1,505

Table 6 below provides an illustrative bill for a Small General Service customer in the Program with average consumption who offsets 100 per cent of that consumption on an annual basis. As shown, the annual bill for this illustrative customer is $133, compared to $1,505 for the illustrative customer who offsets 50 per cent of consumption as shown in Table 5, and $2,877 for the non-participant, as shown in Table 4.

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[13] **Where** 10,948 **is calculated as 50 per cent of annual consumption. Note that results may not exactly match due to rounding.**

[14] **As RS 13xx customers are billed bi-monthly, results are summed over two months.**

[15] **Billed energy is always equal to net energy in this scenario as no Generation Account Balance accumulates.**

[16] **Fiscal 2020 Interim Approved RS 13xx Rates. As there is no Generation Account Balance, the RS 1289 Energy Price is not applicable.**

Table 6 Energy Usage and Bills for an average RS 1101 Customer who Offsets 100 per cent of their Annual Consumption

(A) Month	(B) Percentage of Total Annual Generation (%) (Refer to Figure 2)	(C) Consumption (kWh) (Table 4 Column B)	(D) Generation (kWh) D = 21,897 * B[17]	(E) Monthly Net Energy (kWh) E = C-D	(F) Billing Period Net Energy (kWh)[18]	(G) Billed Energy (kWh)[19]	(H) Total Bill ($)[20]
Apr	13	1,765	2,766	(1,001)	(2,870)	0	22
May	17	1,956	3,825	(1,869)			
June	13	1,572	2,884	(1,311)	(2,346)	0	22
July	13	1,716	2,750	(1,034)			
August	13	1,630	2,809	(1,179)	(1,588)	0	22
September	10	1,791	2,201	(409)			
October	6	1,585	1,307	277	1,449	0	22
November	3	1,723	552	1,172			
December	1	1,827	164	1,662	3,810	0	23
January	1	2,272	125	2,147			
February	3	2,046	653	1,394	1,543	0	22
March	9	2,013	1,863	149			
Total	100	21,897	21,897	0	0	0	133

Actual Average Residential (RS 1101) Cost-Shifting Analysis

To calculate the extent to which BC Hydro recovers its cost to serve Residential (RS 1101) customers in the Program, BC Hydro compared its cost of service with revenue from customers in the Program and the value of generation delivered to BC Hydro's system from those customers. This analysis was completed for 409 RS 1101 Net Metering Program Participants, with the following generation sources: 396 solar photovoltaic, three hydro, one hydro and solar photovoltaic, six wind, two wind and solar photovoltaic, and one biogas.

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[17] **Where 21,897 is calculated as 100 per cent of annual consumption. Note that results may not exactly match due to rounding.**

[18] **As RS 13xx customers are billed bi-monthly, results are summed over two months.**

[19] **Billed energy is always equal to zero in this scenario as the customer offsets all their consumption.**

[20] **Fiscal 2020 Interim Approved RS 13xx Basic Charge. Energy charges do not apply as billed energy is zero. As there is no Generation Account Balance at the end of the year, the RS 1289 Energy Price is not applicable.**

Costs are based on BC Hydro's standard embedded cost methodology as described in our Fully Allocated Cost of Service Studies. Fiscal 2016 data was used because, at the time the analysis was performed, BC Hydro's most recent Fully Allocated Cost of Service Study was for fiscal 2016. BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study was filed with the BCUC on March 15, 2018.

Based on the data analyzed, the actual average cost shifting per Residential (RS 1101) Customer in the Net Metering Program was $456 in Fiscal 2016. BC Hydro recovered 68 per cent of the cost to serve Residential RS 1101 customers in the Program compared to 91 per cent recovery for the Residential Rate Class as a whole. These results are described further below.

Table 7 BC Hydro's Costs of Service

Classification	Description	Average Unit Cost	Source
Energy-related	BC Hydro's average costs of energy over a full year for residential customers	$0.031/kWh	BC Hydro Fiscal 2016 Fully Allocated Cost of Service Study
Demand-related	BC Hydro's cost to serve a customer's peak load or power draw. These costs include Transmission, Distribution and Generation Demand. These costs are set by power requirements during BC Hydro's peak periods which occur in evenings and in winter. As shown in Figure 1 above, and in BC Hydro's response to BCUC IR 1.14.2, generation from Residential customers in the Program does not coincide with these peak periods. Further, energy purchases from by BC Hydro by Residential customers in the Program follow a similar pattern as all residential customers. As a result, generation from Residential (RS 1101) customers in the Program has energy value only, and no demand value. Accordingly, Demand-related costs are applicable.	$12.82/kW per month	BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study, Peak Demand Sampling Analysis on Smart Metering Infrastructure and Load Research Interval Data and Load Shape Analysis

Customer-related	**BC Hydro's costs associated with metering, billing and components of the distribution system.**	**$139.88/account per year**	**BC Hydro's Fiscal 2016 Fully Allocated Cost of Service Study, excluding Net Metering Program Administration Costs**
Net Metering Program Administration	**BC Hydro's costs to administer the Net Metering Program**	**$175/account per year**	**Net Metering Evaluation Report No. 4 (Fiscal 2016 data: $112,000 total estimated cost divided by 640 total customers)**

Table 8 below provides BC Hydro's costs of service in Fiscal 2016 for 409 Residential customers in the Program taking service under RS 1101, based on the unit costs provided above, as well as the revenues and value of the generation BC Hydro received from those same 409 Customers. As shown, BC Hydro recovered 68 per cent of its cost of service, resulting in actual average cost shifting of $456 per customer in Fiscal 2016.

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**

<u>Hypothetical Residential RS 1101 Customer Cost-Shifting Analysis</u>

Using the same methodology as described above, BC Hydro conducted a cost-shifting analysis for the three illustrative Residential customer scenarios referenced in the question. As none of these three scenarios are based on actual customer load and revenues, the results of the analysis are hypothetical.

- **Cost shifting for a Residential Customer with average usage (refer to Table 1) was $212 over the year, and the revenue to cost ratio was 84 per cent. This is different from the Residential Rate Class average revenue to cost ratio of 91 per cent presented in Table 8, as the average usage residential RS 1101 customer is not representative of the entire Residential Rate Class.**
- **Cost shifting for the scenario of a hypothetical Residential Customer with average usage who offsets 50 per cent of their generation on an annual basis (refer to Table 2) is estimated to be $744 over a year with a revenue to cost ratio of 44 per cent.**
- **Cost shifting for the scenario of a hypothetical Residential Customer with average usage who offsets 100 per cent of their generation on an annual basis (refer to Table 3) is estimated to be $1,094 over a year with a revenue to cost ratio of 7 per cent.**

5.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18; Order G-5-17, Appendix A, pp. 2, 34
Cost-shifting to non-participants

Page 2 of Appendix A to Order G-5-17[1] states that BC Hydro includes the following approval sought in its BC Hydro 2015 Rate Design Application:

Effective April 1, 2017, a one-time increase to RS 13xx basic charge that would allow the basic charge to recover approximately 45 percent of BC Hydro's customer-related costs attributable to the Small General Service (SGS) rate class in the F2016 Cost of Service (COS) study, and a one-time offsetting decrease in the energy rate to maintain forecast revenue neutrality based on the SGS revenue target calculated using any applicable rate increases arising from the F2017 Revenue Requirements Application.

The above approval was approved as explained on page 34 of Appendix A to Order G-5-17.

On page 18 of the Application, BC Hydro states:

Further, BC Hydro believes that Surplus Energy Payments ranging from $28,000 to $74,000 are unfair to non-participating customers, go far beyond any limited cost-shifting that may be warranted to support the Program and over time, if not addressed, could represent a substantial cost to BC Hydro and to all customers.

1.5.2 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.

1.5.2.1 Please replicate the analysis above for each of the other rate classes that currently has customers enrolled in the NM program.

[1] https://www.bcuc.com/Documents/Proceedings/2017/DOC_48618_01-20-2017_G-5-17_BCH-2015-RDA-Decision-WEB.pdf

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.

5.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18; Order G-5-17, Appendix A, pp. 2, 34
Cost-shifting to non-participants

Page 2 of Appendix A to Order G-5-17[1] states that BC Hydro includes the following approval sought in its BC Hydro 2015 Rate Design Application:

Effective April 1, 2017, a one-time increase to RS 13xx basic charge that would allow the basic charge to recover approximately 45 percent of BC Hydro's customer-related costs attributable to the Small General Service (SGS) rate class in the F2016 Cost of Service (COS) study, and a one-time offsetting decrease in the energy rate to maintain forecast revenue neutrality based on the SGS revenue target calculated using any applicable rate increases arising from the F2017 Revenue Requirements Application.

The above approval was approved as explained on page 34 of Appendix A to Order G-5-17.

On page 18 of the Application, BC Hydro states:

Further, BC Hydro believes that Surplus Energy Payments ranging from $28,000 to $74,000 are unfair to non-participating customers, go far beyond any limited cost-shifting that may be warranted to support the Program and over time, if not addressed, could represent a substantial cost to BC Hydro and to all customers.

1.5.2 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.

1.5.2.2 Please compare the effect of cost-shifting on an annual basis versus on a billing cycle basis, including the effect from NM customers' ability to accumulate credits in the Generation Account Balance to offset Net Consumption in a subsequent billing period.

[1] https://www.bcuc.com/Documents/Proceedings/2017/DOC_48618_01-20-2017_G-5-17_BCH-2015-RDA-Decision-WEB.pdf

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.2 where we provide illustrative bills for a hypothetical RS 1101 customer and a hypothetical RS 13xx customer.

To illustrate the cost-shifting that occurs from the ability of customers in the Program to accumulate a Generation Account Balance to offset their consumption in a subsequent billing period, BC Hydro applied both the current Energy Price and the proposed Energy Price, using 2018 calendar year data, to the illustrative bills provided in our response to BCUC IR 1.5.2.

The table below shows the total illustrative bills from BC Hydro's response to BCUC IR 1.5.2 compared to the total illustrative bills in a hypothetical scenario where that customer was not able to accumulate a Generation Account Balance to apply against future consumption and all excess generation was purchased at the end of each billing period at the Energy Price.

Illustrative Bill Example (BCUC IR 1.5.2)	Illustrative Bill	Illustrative Bill if All Excess Generation Purchased Each Billing Period at Energy Price of 9.99 cents per kWh	Illustrative Bill if All Excess Generation Purchased Each Billing Period at Energy Price of 3.99 cents per kWh
RS 1101 Customer (50% Consumption Offset)	$577[2]	$576	$592
RS 1101 Customer (100% Consumption Offset)	$76[3]	$87	$309
RS 13xx Customer (50% Consumption Offset)[4]	$1,505[5]	$1,505	$1,505
RS 13xx Customer (100% Consumption Offset)	$133[6]	$306	$714

2 Refer to Table 2 of BC Hydro's response to BCUC IR 1.5.2

3 Refer to Table 3 of BC Hydro's response to BCUC IR 1.5.2.

4 As no Generation Account Balance accumulates in this scenario, the illustrative bill does not change if the customer is unable to offset consumption in subsequent billing period(s).

5 Refer to Table 5 of BC Hydro's response to BCUC IR 1.5.2

6 Refer to Table 6 of BC Hydro's response to BCUC IR 1.5.2.

5.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18; Order G-5-17, Appendix A, pp. 2, 34
Cost-shifting to non-participants

Page 2 of Appendix A to Order G-5-17[1] states that BC Hydro includes the following approval sought in its BC Hydro 2015 Rate Design Application:

Effective April 1, 2017, a one-time increase to RS 13xx basic charge that would allow the basic charge to recover approximately 45 percent of BC Hydro's customer-related costs attributable to the Small General Service (SGS) rate class in the F2016 Cost of Service (COS) study, and a one-time offsetting decrease in the energy rate to maintain forecast revenue neutrality based on the SGS revenue target calculated using any applicable rate increases arising from the F2017 Revenue Requirements Application.

The above approval was approved as explained on page 34 of Appendix A to Order G-5-17.

On page 18 of the Application, BC Hydro states:

Further, BC Hydro believes that Surplus Energy Payments ranging from $28,000 to $74,000 are unfair to non-participating customers, go far beyond any limited cost-shifting that may be warranted to support the Program and over time, if not addressed, could represent a substantial cost to BC Hydro and to all customers.

1.5.3 Please confirm, or explain otherwise, that the purpose of the proposed changes to the tariff to limit Annual Energy Output to the Annual Load is to limit cost-shifting.

RESPONSE:

The purpose of the proposed changes to the tariff to limit the estimated Annual Energy Output to 110 per cent of the estimated Annual Load is to meet Objective 1, as outlined in section 1.1 of the Application. Objective 1 is "Maintain the Program as a load offset program so that customers can generate their own electricity to reduce their supply from BC Hydro." This proposed change continues to make the Program available to customers who intend to generate electricity to offset part or all of their Annual Load while preventing customers from installing an Oversized Generating Facility with the likely objective of selling energy to BC Hydro on a consistent basis, similar to an IPP.

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1 https://www.bcuc.com/Documents/Proceedings/2017/DOC_48618_01-20-2017_G-5-17_BCH-2015-RDA-Decision-WEB.pdf.

The proposed amendments to the Energy Price are intended to limit the cost-shifting associated with Surplus Energy Payments. Assuming the Energy Price reflected the value BC Hydro receives from excess generation, BC Hydro believes there would still be a need to limit the size of a customer's Generating Facility so that the Program is maintained as a load offset program.

5.0 B. SIZE OF GENERATING FACILITY

Reference: SURPLUS ENERGY
Exhibit B-1, p. 18; Order G-5-17, Appendix A, pp. 2, 34
Cost-shifting to non-participants

Page 2 of Appendix A to Order G-5-17[1] states that BC Hydro includes the following approval sought in its BC Hydro 2015 Rate Design Application:

Effective April 1, 2017, a one-time increase to RS 13xx basic charge that would allow the basic charge to recover approximately 45 percent of BC Hydro's customer-related costs attributable to the Small General Service (SGS) rate class in the F2016 Cost of Service (COS) study, and a one-time offsetting decrease in the energy rate to maintain forecast revenue neutrality based on the SGS revenue target calculated using any applicable rate increases arising from the F2017 Revenue Requirements Application.

The above approval was approved as explained on page 34 of Appendix A to Order G-5-17.

On page 18 of the Application, BC Hydro states:

Further, BC Hydro believes that Surplus Energy Payments ranging from $28,000 to $74,000 are unfair to non-participating customers, go far beyond any limited cost-shifting that may be warranted to support the Program and over time, if not addressed, could represent a substantial cost to BC Hydro and to all customers.

1.5.3 Please confirm, or explain otherwise, that the purpose of the proposed changes to the tariff to limit Annual Energy Output to the Annual Load is to limit cost-shifting.

1.5.3.1 Please discuss whether BC Hydro considers there would be a need to limit the proposed generation size if the Energy Price more accurately reflected BC Hydro's marginal cost of providing energy to NM customers.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.3 where we state that assuming the Energy Price reflected the value BC Hydro receives from excess generation, BC Hydro believes there would still be a need to limit the size of a customer's Generating Facility so that the Program is maintained as a load offset program.

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1 https://www.bcuc.com/Documents/Proceedings/2017/DOC_48618_01-20-2017_G-5-17_BCH-2015-RDA-Decision-WEB.pdf

6.0 B. SIZE OF GENERATING FACILITY

Reference: SIZE OF GENERATION FACILITY
Exhibit B-1, Section 2.3, p. 18, Appendix B, pp. 2–3
Annual Energy Output

On page 18 of the Application, BC Hydro states:

The 2018 Amendment Application sought to amend RS 1289 so that customers could not bypass an existing load on their premises or size their Generating Facility to have an estimated Annual Energy Output that was greater than their estimated Annual Load.

BC Hydro proposes the following wording in its tariff, and is provided on pages 2 to 3 of Appendix B of the Application:

2. Annual Energy Output

   The Annual Energy Output is the calculated annual energy output for a Generating Facility that will be calculated as follows:

   Generating Facility's nameplate rating in kilowatts x capacity factor x 365 days x 24 hours, where the capacity factor is:

   - 10 per cent for photovoltaic;
   - 20 per cent for biogas, thermal and wind;
   - 30 per cent for fuel cell; and
   - 40 per cent for hydro.

   For inverter based Generating Facilities, the nameplate rating for a Generating Facility is the total capacity of the inverters (AC capacity).

7. Generating Facility

   Generating Facility for the purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

   (a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a "clean or renewable resource" in the Clean Energy Act (as updated from time to time) to generate Electricity;

1.6.1 Please explain how each of the capacity factors under Annual Energy Output were determined.

RESPONSE:

The purpose of the capacity factors in the Annual Energy Output definition is to provide a simple and transparent calculation of Annual Energy Output for all customers taking service under Rate Schedule 1289.

The capacity factors are based on research completed for BC Hydro's 2005 Resource Options Report and were included in the 2008 Net Metering Re-pricing Application, the Fiscal 2011 Net Metering Evaluation Report and Application to Amend Rate Schedule 1289 and the 2018 Amendment Application.

6.0 B. SIZE OF GENERATING FACILITY

Reference: SIZE OF GENERATION FACILITY
Exhibit B-1, Section 2.3, p. 18, Appendix B, pp. 2–3
Annual Energy Output

On page 18 of the Application, BC Hydro states:

The 2018 Amendment Application sought to amend RS 1289 so that customers could not bypass an existing load on their premises or size their Generating Facility to have an estimated Annual Energy Output that was greater than their estimated Annual Load.

BC Hydro proposes the following wording in its tariff, and is provided on pages 2 to 3 of Appendix B of the Application:

2. Annual Energy Output

The Annual Energy Output is the calculated annual energy output for a Generating Facility that will be calculated as follows:

Generating Facility's nameplate rating in kilowatts x capacity factor x 365 days x 24 hours, where the capacity factor is:

- 10 per cent for photovoltaic;
- 20 per cent for biogas, thermal and wind;
- 30 per cent for fuel cell; and
- 40 per cent for hydro.

For inverter based Generating Facilities, the nameplate rating for a Generating Facility is the total capacity of the inverters (AC capacity).

7. Generating Facility

Generating Facility for the purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

(a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a "clean or renewable resource" in the Clean Energy Act (as updated from time to time) to generate Electricity;

1.6.2 Please discuss whether the capacity factor for the same type of generation can differ depending on the geographical location of the generation facility.

RESPONSE:

Yes, 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.

BC Hydro has used a fixed capacity factor for each generation type. We have found that this approach supports the objective of offering an accessible, streamlined and transparent process for participation, as set out in section 1.1 of the Application.

For customers participating in the Program, using a fixed capacity factor for each generation type simplifies the application process and provides increased certainty with regards to the Annual Energy Output calculation. The absence of a fixed capacity factor would likely require customers to provide documentation to BC Hydro to verify the estimated Annual Energy Output of their specific Generating Facility and would increase the costs to the customer to prepare additional document requirements. That said, customers able to undertake such work may be able to calculate an Annual Energy Output that more accurately reflects their specific Generating Facility.

For BC Hydro, 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.

6.0 B. SIZE OF GENERATING FACILITY

Reference: SIZE OF GENERATION FACILITY
Exhibit B-1, Section 2.3, p. 18, Appendix B, pp. 2–3
Annual Energy Output

On page 18 of the Application, BC Hydro states:

The 2018 Amendment Application sought to amend RS 1289 so that customers could not bypass an existing load on their premises or size their Generating Facility to have an estimated Annual Energy Output that was greater than their estimated Annual Load.

BC Hydro proposes the following wording in its tariff, and is provided on pages 2 to 3 of Appendix B of the Application:

2. Annual Energy Output

The Annual Energy Output is the calculated annual energy output for a Generating Facility that will be calculated as follows:

Generating Facility's nameplate rating in kilowatts x capacity factor x 365 days x 24 hours, where the capacity factor is:

- 10 per cent for photovoltaic;
- 20 per cent for biogas, thermal and wind;
- 30 per cent for fuel cell; and
- 40 per cent for hydro.

For inverter based Generating Facilities, the nameplate rating for a Generating Facility is the total capacity of the inverters (AC capacity).

7. Generating Facility

Generating Facility for the purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

(a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a “clean or renewable resource” in the Clean Energy Act (as updated from time to time) to generate Electricity;

1.6.2 Please discuss whether the capacity factor for the same type of generation can differ depending on the geographical location of the generation facility.

1.6.2.1 If yes, please discuss the advantages and disadvantages for the NM customer using a fixed capacity factor for each generation type

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.2 where we explain the advantages and disadvantages to customers in the Program, of using a fixed capacity factor for each generation type.

6.0 B. SIZE OF GENERATING FACILITY

Reference: SIZE OF GENERATION FACILITY
Exhibit B-1, Section 2.3, p. 18, Appendix B, pp. 2–3
Annual Energy Output

On page 18 of the Application, BC Hydro states:

The 2018 Amendment Application sought to amend RS 1289 so that customers could not bypass an existing load on their premises or size their Generating Facility to have an estimated Annual Energy Output that was greater than their estimated Annual Load.

BC Hydro proposes the following wording in its tariff, and is provided on pages 2 to 3 of Appendix B of the Application:

2. Annual Energy Output

The Annual Energy Output is the calculated annual energy output for a Generating Facility that will be calculated as follows:

Generating Facility's nameplate rating in kilowatts x capacity factor x 365 days x 24 hours, where the capacity factor is:

- 10 per cent for photovoltaic;
- 20 per cent for biogas, thermal and wind;
- 30 per cent for fuel cell; and
- 40 per cent for hydro.

For inverter based Generating Facilities, the nameplate rating for a Generating Facility is the total capacity of the inverters (AC capacity).

7. Generating Facility

Generating Facility for the purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

(a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a "clean or renewable resource" in the Clean Energy Act (as updated from time to time) to generate Electricity;

1.6.2 Please discuss whether the capacity factor for the same type of generation can differ depending on the geographical location of the generation facility.

1.6.2.2 If yes, please discuss the advantages and disadvantages for BC Hydro of using a fixed capacity factor for each generation type.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.2 where we state that, for BC Hydro, 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.

6.0 B. SIZE OF GENERATING FACILITY

Reference: SIZE OF GENERATION FACILITY
Exhibit B-1, Section 2.3, p. 18, Appendix B, pp. 2–3
Annual Energy Output

On page 18 of the Application, BC Hydro states:

The 2018 Amendment Application sought to amend RS 1289 so that customers could not bypass an existing load on their premises or size their Generating Facility to have an estimated Annual Energy Output that was greater than their estimated Annual Load.

BC Hydro proposes the following wording in its tariff, and is provided on pages 2 to 3 of Appendix B of the Application:

2. Annual Energy Output

The Annual Energy Output is the calculated annual energy output for a Generating Facility that will be calculated as follows:

Generating Facility's nameplate rating in kilowatts x capacity factor x 365 days x 24 hours, where the capacity factor is:

- 10 per cent for photovoltaic;
- 20 per cent for biogas, thermal and wind;
- 30 per cent for fuel cell; and
- 40 per cent for hydro.

For inverter based Generating Facilities, the nameplate rating for a Generating Facility is the total capacity of the inverters (AC capacity).

7. Generating Facility

Generating Facility for the purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

(a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a "clean or renewable resource" in the Clean Energy Act (as updated from time to time) to generate Electricity;

1.6.3 Please explain whether the capacity factor for each type of qualifying "Generation Facility" (e.g. Biomass, geothermal heat, ocean) is specified under the "Annual Energy Output" section.

RESPONSE:

The Annual Energy Output section provides capacity factors for common, commercially-available generation categories. All of the generator types used by current participants in the Program, as shown in Table 2 of section 1.5 of the Application, are covered in the categories included in this section. For example, biomass and geothermal heat are in the thermal generation category.

Generation types such as tidal and ocean, are considered emerging technologies and are generally not commercial available with a maximum nameplate capacity of 100 kW or less. BC Hydro does not have sufficient data to include a capacity factor for these emerging technologies in the proposed tariff wording. If a customer were to propose a Generating Facility that uses a clean or renewable resource that is not specified under the "Annual Energy Output" section, BC Hydro would determine the appropriate capacity factor on a case by case basis and would seek an amendment to the tariff to include the applicable additional information.

6.0 B. SIZE OF GENERATING FACILITY

Reference: SIZE OF GENERATION FACILITY
Exhibit B-1, Section 2.3, p. 18, Appendix B, pp. 2–3
Annual Energy Output

On page 18 of the Application, BC Hydro states:

The 2018 Amendment Application sought to amend RS 1289 so that customers could not bypass an existing load on their premises or size their Generating Facility to have an estimated Annual Energy Output that was greater than their estimated Annual Load.

BC Hydro proposes the following wording in its tariff, and is provided on pages 2 to 3 of Appendix B of the Application:

2. Annual Energy Output

The Annual Energy Output is the calculated annual energy output for a Generating Facility that will be calculated as follows:

Generating Facility's nameplate rating in kilowatts x capacity factor x 365 days x 24 hours, where the capacity factor is:

- 10 per cent for photovoltaic;
- 20 per cent for biogas, thermal and wind;
- 30 per cent for fuel cell; and
- 40 per cent for hydro.

For inverter based Generating Facilities, the nameplate rating for a Generating Facility is the total capacity of the inverters (AC capacity).

7. Generating Facility

Generating Facility for the purposes of this Rate Schedule means a generating facility, including fuel cells and energy recovery generation, that:

(a) Utilizes biogas, biomass, geothermal heat, hydro, solar, ocean, wind or other energy resources or technologies defined as a "clean or renewable resource" in the Clean Energy Act (as updated from time to time) to generate Electricity;

1.6.3 Please explain whether the capacity factor for each type of qualifying "Generation Facility" (e.g. Biomass, geothermal heat, ocean) is specified under the "Annual Energy Output" section.

1.6.3.1 If all types of Generation Facilities are not specified under the "Annual Energy Output" section, please explain how the Annual Energy Output will be determined in those cases.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.6.3, which explains how BC Hydro would determine the capacity factor for Generating Facilities not specified under the "Annual Energy Output" section.

7.0 B. SIZE OF GENERATING FACILITY

Reference: SUPLUS ENERGY
Exhibit B-1, Appendix B, pp. 2–3
Definition of Annual Load

BC Hydro proposes the following wording in its tariff, and is provided on pages 1-3 of Appendix B of the Application:

Availability	For any Residential Service Customer and for any General Service Customer who: 1. installs a Generating Facility to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises, and 2. has had their Net Metering Application for Service under this Rate Schedule accepted by BC Hydro in writing and has received Interconnection Approval. With the consent of BC Hydro, Customers taking Service under other Rate Schedules may be admitted to Service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

3. Annual Load

The Annual Load is the estimated annual Electricity requirements on the Customer's Premises, calculated based on:

(a) The total kilowatt hours of Electricity supplied by BC Hydro to the Customer's Point of Delivery based on the Customer's billing data from the 12 consecutive months immediately preceding BC Hydro's receipt of the Customer's Net Metering Application;

(b) if 12 consecutive months of billing data is not available, an estimate of the annual Electricity requirements, supported by the Customer's billing data to the date of the Customer's Net Metering Application and other relevant Customer information satisfactory to BC Hydro in its sole discretion; and

(c) if the Customer provides BC Hydro with evidence of the purchase of new equipment, such as an electric vehicle, for use on the Customer's Premises, BC Hydro may increase the Customer's estimated Annual Load by the estimated amount of Electricity that the new equipment is expected to require, as determined by BC Hydro in its sole discretion.

1.7.1 Please explain whether the requirement “to generate electricity to serve all or part of their Electricity requirements on the Customer’s Premises” is assessed upon enrolment only or on an ongoing basis to maintain enrolment eligibility in the NM program.

RESPONSE:

The requirement “to generate electricity to serve all or part of their Electricity requirements on the Customer’s Premises” is assessed upon enrolment and upon an application by the customer to expand the generating capacity of their Generating Facility or to modify their Generating Facility. This is set out in the definition of “Net Metering Application” in paragraph 12 of the Definitions section of the revised tariff pages (Appendix B of the Application).

7.0 B. SIZE OF GENERATING FACILITY

Reference: SUPLUS ENERGY
Exhibit B-1, Appendix B, pp. 2–3
Definition of Annual Load

BC Hydro proposes the following wording in its tariff, and is provided on pages 1-3 of Appendix B of the Application:

Availability	For any Residential Service Customer and for any General Service Customer who: 1. installs a Generating Facility to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises, and 2. has had their Net Metering Application for Service under this Rate Schedule accepted by BC Hydro in writing and has received Interconnection Approval. With the consent of BC Hydro, Customers taking Service under other Rate Schedules may be admitted to Service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

3. Annual Load

The Annual Load is the estimated annual Electricity requirements on the Customer's Premises, calculated based on:

(a) The total kilowatt hours of Electricity supplied by BC Hydro to the Customer's Point of Delivery based on the Customer's billing data from the 12 consecutive months immediately preceding BC Hydro's receipt of the Customer's Net Metering Application;

(b) if 12 consecutive months of billing data is not available, an estimate of the annual Electricity requirements, supported by the Customer's billing data to the date of the Customer's Net Metering Application and other relevant Customer information satisfactory to BC Hydro in its sole discretion; and

(c) if the Customer provides BC Hydro with evidence of the purchase of new equipment, such as an electric vehicle, for use on the Customer's Premises, BC Hydro may increase the Customer's estimated Annual Load by the estimated amount of Electricity that the new equipment is expected to require, as determined by BC Hydro in its sole discretion.

1.7.1 Please explain whether the requirement "to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises" is assessed upon enrolment only or on an ongoing basis to maintain enrolment eligibility in the NM program.

1.7.1.1 If the above requirement must always be met when a customer is enrolled in the NM program, please discuss i) how often does BC Hydro evaluate whether a current NM customer continues to meet this requirement, and ii) how does BC Hydro account for fluctuations in a customer's generation and consumption.

RESPONSE:

BC Hydro does not assess the requirement "to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises" on an ongoing basis. As discussed in BC Hydro's response to BCUC IR 1.7.1, this requirement is assessed upon enrolment and upon an application by the customer to expand the generating capacity of their Generating Facility or to modify their Generating Facility.

7.0 B. SIZE OF GENERATING FACILITY

Reference: SUPLUS ENERGY
Exhibit B-1, Appendix B, pp. 2–3
Definition of Annual Load

BC Hydro proposes the following wording in its tariff, and is provided on pages 1-3 of Appendix B of the Application:

Availability	For any Residential Service Customer and for any General Service Customer who: 1. installs a Generating Facility to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises, and 2. has had their Net Metering Application for Service under this Rate Schedule accepted by BC Hydro in writing and has received Interconnection Approval. With the consent of BC Hydro, Customers taking Service under other Rate Schedules may be admitted to Service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

3. Annual Load

The Annual Load is the estimated annual Electricity requirements on the Customer's Premises, calculated based on:

(a) The total kilowatt hours of Electricity supplied by BC Hydro to the Customer's Point of Delivery based on the Customer's billing data from the 12 consecutive months immediately preceding BC Hydro's receipt of the Customer's Net Metering Application;

(b) if 12 consecutive months of billing data is not available, an estimate of the annual Electricity requirements, supported by the Customer's billing data to the date of the Customer's Net Metering Application and other relevant Customer information satisfactory to BC Hydro in its sole discretion; and

(c) if the Customer provides BC Hydro with evidence of the purchase of new equipment, such as an electric vehicle, for use on the Customer's Premises, BC Hydro may increase the Customer's estimated Annual Load by the estimated amount of Electricity that the new equipment is expected to require, as determined by BC Hydro in its sole discretion.

1.7.2 For the purpose of determining the appropriate size of the generation facility, please discuss whether BC Hydro has considered calculating Annual Load based on a customer's peak load rather than annual average electricity requirement. If yes, please explain why calculating Annual Load based on peak load is not proposed. If not, why not?

RESPONSE:

BC Hydro has not considered calculating Annual Load based on a customer's peak load rather than annual average electricity requirement. Calculating Annual Load based on a customer's peak load would allow for Oversized Generating Facilities because the Generating Facility would generate excess energy when a customer's consumption is less than the peak.

In addition, because customers are able to apply their Generation Account Balance against future electricity consumption, an Annual Load calculated based on a customer's annual average electricity requirement would, on average, allow a customer to fully offset their own electricity consumption over the year, regardless of their peak load requirement.

Accordingly, BC Hydro believes that calculating Annual Load based on a customer's annual average electricity requirement is more consistent with the objective to maintain the Program as a load offset program so that customers can generate their own electricity to reduce their supply from BC Hydro.

7.0 B. SIZE OF GENERATING FACILITY

Reference: SUPLUS ENERGY
Exhibit B-1, Appendix B, pp. 2–3
Definition of Annual Load

BC Hydro proposes the following wording in its tariff, and is provided on pages 1-3 of Appendix B of the Application:

Availability	For any Residential Service Customer and for any General Service Customer who: 1. installs a Generating Facility to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises, and 2. has had their Net Metering Application for Service under this Rate Schedule accepted by BC Hydro in writing and has received Interconnection Approval. With the consent of BC Hydro, Customers taking Service under other Rate Schedules may be admitted to Service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

3. Annual Load

The Annual Load is the estimated annual Electricity requirements on the Customer's Premises, calculated based on:

(a) The total kilowatt hours of Electricity supplied by BC Hydro to the Customer's Point of Delivery based on the Customer's billing data from the 12 consecutive months immediately preceding BC Hydro's receipt of the Customer's Net Metering Application;

(b) if 12 consecutive months of billing data is not available, an estimate of the annual Electricity requirements, supported by the Customer's billing data to the date of the Customer's Net Metering Application and other relevant Customer information satisfactory to BC Hydro in its sole discretion; and

(c) if the Customer provides BC Hydro with evidence of the purchase of new equipment, such as an electric vehicle, for use on the Customer's Premises, BC Hydro may increase the Customer's estimated Annual Load by the estimated amount of Electricity that the new equipment is expected to require, as determined by BC Hydro in its sole discretion.

1.7.3 Please explain whether the definition of Annual Load accounts for future changes in load, such as energy conservation, changes in occupancy, or other changes in needs on the premises that are not dependent on the purchase of new equipment.

RESPONSE:

As noted in section 2.7 of the Application, the amendments proposed in the Application clarify that customers may increase the size of their Generating Facility at any time, as their historical load data allows. This is reflected in the proposed Definition of "Net Metering Application" (paragraph 12 of the Definitions section of the revised tariff pages).

The definition of Annual Load accounts for future changes in load, such as energy conservation, changes in occupancy or other changes in needs on the premises, that are not dependent on the purchase of new equipment, to the extent that these changes are reflected in the customer's historical load data.

Paragraph 3, subsection (b) of the Definitions section of the revised tariff pages is intended to enable customers who purchase new equipment (e.g., an electric vehicle) to increase the size of their Generating Facility by an amount determined by BC Hydro, without requiring additional historical load data.

A similar provision for changes in needs on the premises that are not dependent on the purchase of new equipment is not included in the revised tariff because it would be difficult to verify and estimate the impact of such changes, without requiring additional historical load data.

7.0 B. SIZE OF GENERATING FACILITY

Reference: SUPLUS ENERGY
Exhibit B-1, Appendix B, pp. 2–3
Definition of Annual Load

BC Hydro proposes the following wording in its tariff, and is provided on pages 1-3 of Appendix B of the Application:

Availability	For any Residential Service Customer and for any General Service Customer who: 1. installs a Generating Facility to generate electricity to serve all or part of their Electricity requirements on the Customer's Premises, and 2. has had their Net Metering Application for Service under this Rate Schedule accepted by BC Hydro in writing and has received Interconnection Approval. With the consent of BC Hydro, Customers taking Service under other Rate Schedules may be admitted to Service under this Rate Schedule, provided that BC Hydro is satisfied that the metering, billing and other requirements of this Rate Schedule can be met.

3. Annual Load

The Annual Load is the estimated annual Electricity requirements on the Customer's Premises, calculated based on:

(a) The total kilowatt hours of Electricity supplied by BC Hydro to the Customer's Point of Delivery based on the Customer's billing data from the 12 consecutive months immediately preceding BC Hydro's receipt of the Customer's Net Metering Application;

(b) if 12 consecutive months of billing data is not available, an estimate of the annual Electricity requirements, supported by the Customer's billing data to the date of the Customer's Net Metering Application and other relevant Customer information satisfactory to BC Hydro in its sole discretion; and

(c) if the Customer provides BC Hydro with evidence of the purchase of new equipment, such as an electric vehicle, for use on the Customer's Premises, BC Hydro may increase the Customer's estimated Annual Load by the estimated amount of Electricity that the new equipment is expected to require, as determined by BC Hydro in its sole discretion.

1.7.4 Please explain what action BC Hydro would take, if any, if existing customer's energy consumption decreased to consistently result in Surplus Energy.

RESPONSE:

The proposed tariff does not allow BC Hydro to take any action if an existing customer's energy consumption decreases to consistently result in Surplus Energy. BC Hydro recognizes that a customer's energy consumption may decrease over time due to factors such as changes in occupancy.

8.0 C. ANNIVERSARY DATE

Reference: ANNIVERSARY DATE
Exhibit B-1, pp. 6, 28, 29, 31
Optimal and Flexible Anniversary Date

On page 31 of the Application, BC Hydro states:

BC Hydro has considered the Engagement Survey Results, the Jurisdictional Review and the Evaluation Report and is requesting BCUC approval to:

- Assign all customers an Anniversary Date of March 1, an optimized Anniversary Date for customers with solar photovoltaic Generating Facilities, which is the type of Generating Facility installed by 98 per cent of current customers in the Program; and
- Allow customers to choose their Anniversary Date once.

On page 6, BC Hydro states:

BC Hydro is proposing to assign all customers a default Anniversary Date of March 1 and to allow customers to choose their own Anniversary Date once. This would provide all customers in the Program with increased opportunities and flexibility to apply their Generation Account Balance to reduce their supply from BC Hydro.

On page 31, BC Hydro states, "These amendments would allow customers to choose the Anniversary Date that is best for them while also setting a default Anniversary Date that is optimized for the vast majority of customers in the Program."

1.8.1 Please provide a breakdown of the internal costs associated with the administration of the current anniversary date and the proposed flexible anniversary date, including implementation cost, administration costs, management costs.

RESPONSE:

The administration of the Anniversary Date is currently included in the application process for Rate Schedule 1289. Accordingly, current Anniversary Date related costs are not independently identifiable.

Implementation costs for the proposed Anniversary Date amendments are expected to include:

- **System programming to set March 1 as the default Anniversary Date for all customers in the Program (estimated to be approximately $10,000 to $25,000); and**
- **Labour costs associated with responding to customer requests to change their Anniversary Date. BC Hydro expects these costs to be approximately $10.00 per request.**

8.0 C. ANNIVERSARY DATE

Reference: ANNIVERSARY DATE
Exhibit B-1, pp. 6, 28, 29, 31
Optimal and Flexible Anniversary Date

On page 31 of the Application, BC Hydro states:

BC Hydro has considered the Engagement Survey Results, the Jurisdictional Review and the Evaluation Report and is requesting BCUC approval to:

- Assign all customers an Anniversary Date of March 1, an optimized Anniversary Date for customers with solar photovoltaic Generating Facilities, which is the type of Generating Facility installed by 98 per cent of current customers in the Program; and
- Allow customers to choose their Anniversary Date once.

On page 6, BC Hydro states:

BC Hydro is proposing to assign all customers a default Anniversary Date of March 1 and to allow customers to choose their own Anniversary Date once. This would provide all customers in the Program with increased opportunities and flexibility to apply their Generation Account Balance to reduce their supply from BC Hydro.

On page 31, BC Hydro states, “These amendments would allow customers to choose the Anniversary Date that is best for them while also setting a default Anniversary Date that is optimized for the vast majority of customers in the Program.”

1.8.2 Please discuss whether BC Hydro considered allowing customers to reset the Anniversary Date more than once. Please also provide a discussion on the costs associated with multiple resets of the Anniversary Date.

RESPONSE:

BC Hydro has not considered allowing customers to reset the Anniversary Date more than once. BC Hydro believes that assigning a default Anniversary Date to all customers coupled with an ability to change it once provides optimal opportunities and flexibility for customers to apply their Generation Account Balance to reduce their supply from BC Hydro.

The cost of multiple resets of the Anniversary Date would be similar to the one-time request figure provided in BC Hydro’s response to BCUC IR 1.8.1.

8.0 C. ANNIVERSARY DATE

Reference: ANNIVERSARY DATE
Exhibit B-1, pp. 6, 28, 29, 31
Optimal and Flexible Anniversary Date

On page 31 of the Application, BC Hydro states:

BC Hydro has considered the Engagement Survey Results, the Jurisdictional Review and the Evaluation Report and is requesting BCUC approval to:

- Assign all customers an Anniversary Date of March 1, an optimized Anniversary Date for customers with solar photovoltaic Generating Facilities, which is the type of Generating Facility installed by 98 per cent of current customers in the Program; and
- Allow customers to choose their Anniversary Date once.

On page 6, BC Hydro states:

BC Hydro is proposing to assign all customers a default Anniversary Date of March 1 and to allow customers to choose their own Anniversary Date once. This would provide all customers in the Program with increased opportunities and flexibility to apply their Generation Account Balance to reduce their supply from BC Hydro.

On page 31, BC Hydro states, "These amendments would allow customers to choose the Anniversary Date that is best for them while also setting a default Anniversary Date that is optimized for the vast majority of customers in the Program."

1.8.3 Please explain whether BC Hydro foresees any issues with NM customers choosing an Anniversary Date that reduces opportunities to apply their Generation Account Balance to reduce their supply from BC Hydro.

RESPONSE:

BC Hydro expects customers in the Program would choose an Anniversary Date that maximizes their financial benefit from the Program. BC Hydro estimates that the financial impact of providing customers with this ability, based on fiscal 2018 data, is approximately $15,000, as shown in Table 1 of the Application. In addition,

there will be incremental implementation costs, as discussed in BC Hydro's response to BCUC IR 1.8.1.

BC Hydro does not foresee issues with regards to customers in the Program selecting an Anniversary Date that reduces opportunities to apply their Generation Account Balance to reduce their supply from BC Hydro, provided that:

- **The Energy Price reflects the value of the energy received by BC Hydro, as outlined in BC Hydro's response to BCUC IR 1.10.2; and**
- **Customers are only able to change their Anniversary Date once, which prevents customers from requesting multiple changes to their Anniversary Date to take advantage of fluctuations in the Energy Price.**

8.0 C. ANNIVERSARY DATE

Reference: ANNIVERSARY DATE
Exhibit B-1, pp. 6, 28, 29, 31
Optimal and Flexible Anniversary Date

On page 31 of the Application, BC Hydro states:

BC Hydro has considered the Engagement Survey Results, the Jurisdictional Review and the Evaluation Report and is requesting BCUC approval to:

- Assign all customers an Anniversary Date of March 1, an optimized Anniversary Date for customers with solar photovoltaic Generating Facilities, which is the type of Generating Facility installed by 98 per cent of current customers in the Program; and
- Allow customers to choose their Anniversary Date once.

On page 6, BC Hydro states:

BC Hydro is proposing to assign all customers a default Anniversary Date of March 1 and to allow customers to choose their own Anniversary Date once. This would provide all customers in the Program with increased opportunities and flexibility to apply their Generation Account Balance to reduce their supply from BC Hydro.

On page 31, BC Hydro states, “These amendments would allow customers to choose the Anniversary Date that is best for them while also setting a default Anniversary Date that is optimized for the vast majority of customers in the Program.”

1.8.4 Please discuss the scenarios where it would be economical for customers to choose an Anniversary Date that will result in the maximum amount of credit for payout in the Generation Account Balance (e.g. when the Mid-C price is higher than the customer’s retail rate).

RESPONSE:

The only instance where it would be economical for customers to choose an Anniversary Date that would maximize their Surplus Energy Payment and minimize their opportunity to offset their consumption is a scenario where the

Energy Price is greater than the rate charged to customers, under their applicable Rate Schedule. Conversely, in a scenario where the rate charged to customers, under their applicable Rate Schedule, is greater than the Energy Price, it would be economical for customers to maximize their opportunity to offset their consumption and minimize their Surplus Energy Payment.

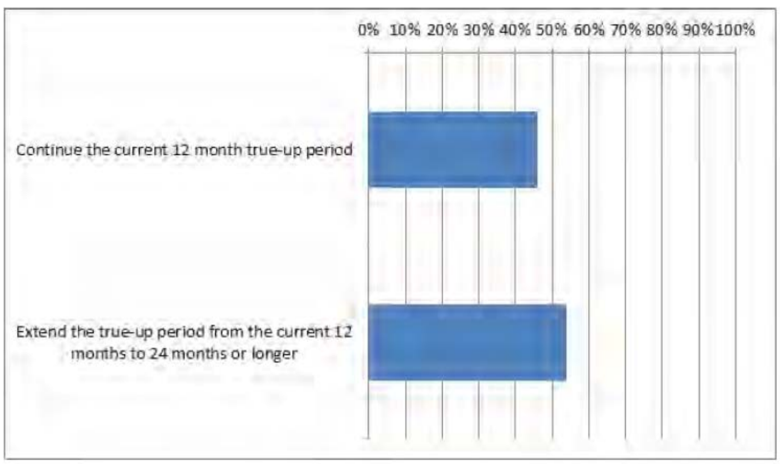
8.0 C. ANNIVERSARY DATE

Reference: ANNIVERSARY DATE
Exhibit B-1, pp. 6, 28, 29, 31
Optimal and Flexible Anniversary Date

On pages 28 and 29 of the Application, BC Hydro states:

As shown in Figure 5 below, the Engagement Survey Results indicate that participants did not have a strong preference with regards to whether the period of time to accumulate and apply a Generation Account Balance between Surplus Energy Payments should be extended with 46 per cent supporting no change and 54 per cent supporting an extension.

Figure 5 Engagement Survey Results – Extending the Period Between Surplus Energy Payments



1.8.5 Please further elaborate on why BC Hydro has chosen to maintain the 12-month option instead of extending the true-up period to, for example, 24-months.

RESPONSE:

BC Hydro chose to maintain the 12 month true-up period because an extended true-up period would have increased cost-shifting from participating customers to non-participating customers. In addition, Engagement Survey participants did not express a strong preference for extending the true-up period.

As explained in BC Hydro's response to BCUC IR 1.5.1, one of the ways that cost-shifting from participating to non-participating customers occurs is when customers in the Program apply their Generation Account Balance to offset their

electricity consumption. An extended true-up period provides customers in the Program with increased opportunities to apply their Generation Account Balance against future consumption.

From the perspective of customers in the Program, maintaining the 12 month true-up period provides annual Surplus Energy Payments but, relative to an extended true-up period, provides fewer opportunities for customers to apply their Generation Account Balance against future consumption. Conversely, extending the true-up period provides customers with increased opportunities to apply their Generation Account Balance against future consumption; however, customers would receive a Surplus Energy Payment less often.

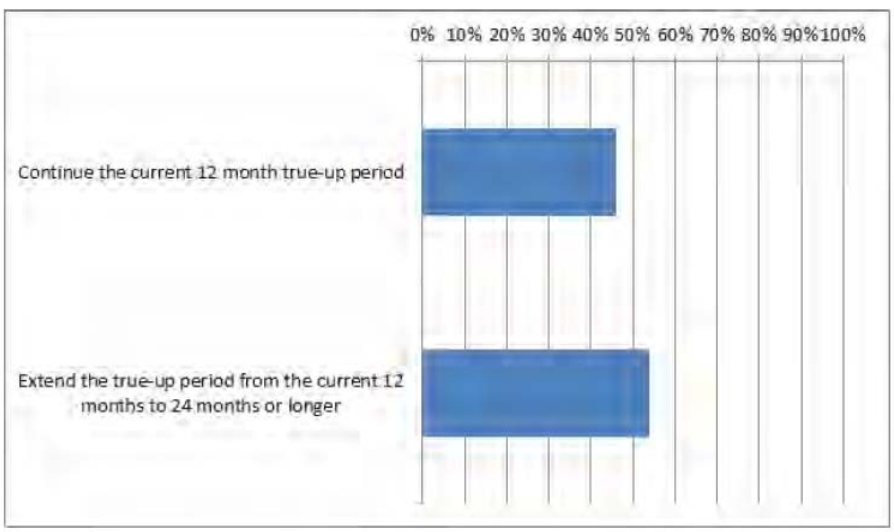
8.0 C. ANNIVERSARY DATE

Reference: ANNIVERSARY DATE
Exhibit B-1, pp. 6, 28, 29, 31
Optimal and Flexible Anniversary Date

On pages 28 and 29 of the Application, BC Hydro states:

As shown in Figure 5 below, the Engagement Survey Results indicate that participants did not have a strong preference with regards to whether the period of time to accumulate and apply a Generation Account Balance between Surplus Energy Payments should be extended with 46 per cent supporting no change and 54 per cent supporting an extension.

Figure 5 Engagement Survey Results – Extending the Period Between Surplus Energy Payments



1.8.5 Please further elaborate on why BC Hydro has chosen to maintain the 12-month option instead of extending the true-up period to, for example, 24-months.

1.8.5.1 Please discuss the implications of extending the true-up period for both BC Hydro and NM customers.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.5 where we explain the implications of extending the true-up period.

9.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 33, 35; Order G-45-11, Appendix A, p. 5[1]
Rate change against Bonbright rate design principles

BC Hydro states on page 33 of the Application that it 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 determined by calculating the average of the daily average Mid-Columbia market prices over the previous calendar year.

BC Hydro explains on page 35 of the Application that "setting the Energy Price on a long-run basis, when the energy received only has a short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers." BC Hydro further states that "It is important to recognize that the current design of the Program, which allows customers to apply a Generation Account Balance towards future consumption, means that energy received from the Program is valued at both the retail rate and the Energy Price."

The Bonbright principles for rate design as referenced by the BCUC in Order G-45-11 regarding
BC Hydro's Residential Inclining Block Rate Re-Pricing Application include the following:

Principle 1: Recovering the Cost of Service; the aggregate of all customer rates and revenues must be sufficient to recover the utility's total cost of service

Principle 2: Fair appointment of costs among customers (appropriate cost recovery should be reflected in rates)

Principle 3: Price signals that encourage efficient use and discourage inefficient use

Principle 4: Customer understanding and acceptance

Principle 5: Practical and cost-effective to implement (sustainable and meet long-term objectives)

Principle 6: Rate Stability (customer rate impact should be managed)

Principle 7: Revenue stability

Principle 8: Avoidance of undue discrimination (interclass equity must be enhanced and maintained)

1.9.1 In a table format, please explain in detail whether BC Hydro's proposal to change the Energy Price from 9.99c/kWh to the average of the daily average Mid-Columbia market aligns with each of the Bonbright rate design principles referenced above.

[1] https://www.ordersdecisions.bcuc.com/bcuc/orders/en/118000/1/document.do

RESPONSE:

The following table provides a discussion of the alignment of BC Hydro's proposed change to the Energy Price with each of the Bonbright rate design principles referenced in BCUC Order No. G-45-11.

Bonbright Principle Referenced in BCUC Order No. G-45-11	Alignment of Proposed Change to Energy Price
Principle 1: Recovering the Cost of Service (the aggregate of all customer rates and revenues must be sufficient to recover the utility's total cost of service)	The aggregate of all customer rates and revenues would continue to be sufficient to recover BC Hydro's total cost of service.
Principle 2: Fair appointment of costs among customers (appropriate cost recovery should be reflected in rates)	The proposed change to the Energy Price is aligned with Principle 2 because it would reflect the value BC Hydro receives from excess generation. Accordingly, it would address the cost-shifting associated with Surplus Energy Payments and reflect fair appointment of costs among customers with regards to the purchase of excess generation from customers in the Program.
Principle 3: Price signals that encourage efficient use and discourage inefficient use	The proposed change to the Energy Price is aligned with Principle 3 because it sends a price signal that would reflect the value BC Hydro receives from excess generation.
Principle 4: Customer understanding and acceptance	The proposed change to the Energy Price is aligned with Principle 4 because the proposed methodology for establishing the Energy Price is relatively simple and transparent, as compared to alternatives such as establishing the Energy Price based on a forecast.
Principle 5: Practical and cost-effective to implement (sustainable and meet long-term objectives)	The proposed change to the Energy Price is aligned with Principle 5 because it is practical and cost effective to implement. The proposed process to calculate the Energy Price is easily understood and uses readily available historical pricing information.

Bonbright Principle Referenced in BCUC Order No. G-45-11	**Alignment of Proposed Change to Energy Price**
Principle 6: Rate Stability (customer rate impact should be managed)	**The proposed change to the Energy Price is aligned with Principle 6 because, as discussed further in BC Hydro's response to BCUC IR 1.12.6.1, it appropriately balances rate stability against the objective of reflecting the value of the energy to non-participating customers.** **In addition, BC Hydro's proposed transitional Energy Price is aligned with Principle 6 because it mitigates the impact to existing customers in the Program.**
Principle 7: Revenue stability	**The proposed change to the Energy Price does not impact the revenue earned by BC Hydro.**
Principle 8: Avoidance of undue discrimination (interclass equity must be enhanced and maintained)	**The proposed change to the Energy Price is aligned with Principle 8 because it is a step towards improving cost recovery from customers in the Program.**

9.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 33, 35; Order G-45-11, Appendix A, p. 5[1]
Rate change against Bonbright rate design principles

BC Hydro states on page 33 of the Application that it 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 determined by calculating the average of the daily average Mid-Columbia market prices over the previous calendar year.

BC Hydro explains on page 35 of the Application that "setting the Energy Price on a long-run basis, when the energy received only has a short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers." BC Hydro further states that "It is important to recognize that the current design of the Program, which allows customers to apply a Generation Account Balance towards future consumption, means that energy received from the Program is valued at both the retail rate and the Energy Price."

The Bonbright principles for rate design as referenced by the BCUC in Order G-45-11 regarding
BC Hydro's Residential Inclining Block Rate Re-Pricing Application include the following:

Principle 1: Recovering the Cost of Service; the aggregate of all customer rates and revenues must be sufficient to recover the utility's total cost of service

Principle 2: Fair appointment of costs among customers (appropriate cost recovery should be reflected in rates)

Principle 3: Price signals that encourage efficient use and discourage inefficient use

Principle 4: Customer understanding and acceptance

Principle 5: Practical and cost-effective to implement (sustainable and meet long-term objectives)

Principle 6: Rate Stability (customer rate impact should be managed)

Principle 7: Revenue stability

[1] https://www.ordersdecisions.bcuc.com/bcuc/orders/en/118000/1/document.do

Principle 8: Avoidance of undue discrimination (interclass equity must be enhanced and maintained)

1.9.2 Please provide the current weighted average cost of energy (including O&M cost of heritage assets) and discuss how it compares with the current Surplus Energy Price at 9.99c/kWh.

RESPONSE:

As shown on line 22 of Schedule 4.0 of Appendix A of BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application, BC Hydro's total weighted cost of energy for fiscal 2020 is forecast to be $35.2/MWh (3.52 cents per kWh), which is significantly lower than the current Energy Price of 9.99 cents per kWh.

BC Hydro's total weighted cost of energy does not include operations and maintenance costs associated with its heritage assets. BC Hydro does not assign these costs when calculating its weighted cost of energy.

9.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 33, 35; Order G-45-11, Appendix A, p. 5[1]
Rate change against Bonbright rate design principles

BC Hydro states on page 33 of the Application that it 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 determined by calculating the average of the daily average Mid-Columbia market prices over the previous calendar year.

BC Hydro explains on page 35 of the Application that "setting the Energy Price on a long-run basis, when the energy received only has a short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers." BC Hydro further states that "It is important to recognize that the current design of the Program, which allows customers to apply a Generation Account Balance towards future consumption, means that energy received from the Program is valued at both the retail rate and the Energy Price."

The Bonbright principles for rate design as referenced by the BCUC in Order G-45-11 regarding
BC Hydro's Residential Inclining Block Rate Re-Pricing Application include the following:

Principle 1: Recovering the Cost of Service; the aggregate of all customer rates and revenues must be sufficient to recover the utility's total cost of service

Principle 2: Fair appointment of costs among customers (appropriate cost recovery should be reflected in rates)

Principle 3: Price signals that encourage efficient use and discourage inefficient use

Principle 4: Customer understanding and acceptance

Principle 5: Practical and cost-effective to implement (sustainable and meet long-term objectives)

Principle 6: Rate Stability (customer rate impact should be managed)

Principle 7: Revenue stability

[1] https://www.ordersdecisions.bcuc.com/bcuc/orders/en/118000/1/document.do

Principle 8: Avoidance of undue discrimination (interclass equity must be enhanced and maintained)

1.9.3 With reference Bonbright Principles #2 and #8 referenced above, please elaborate, and quantify where possible, how setting the Energy Price on a long-run basis goes beyond limited cost-shifting and does not represent a fair value to non-participating customers.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.10.2 for a discussion of the value of excess generation from customers in the Program.

The cost-shifting from customers in the Program to non-participants caused by the current Energy Price is quantified in Table 1 of the Application, based on fiscal 2018 data. The table shows that total Surplus Energy Payments in fiscal 2018 were $324,358 and that the value of that energy to BC Hydro was approximately $89,625. This equates to a difference of $234,732 in fiscal 2018, which would increase in future years if participation in the Program continues to grow.

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

BC Hydro states on page 18 of the Application, "BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use."

On page 34, BC Hydro states, "The link between the SOP price and the Energy Price is based on the premise that the Energy Price should reflect a long-run value instead of a short-run value. BC Hydro believes that this premise is incorrect and should be re-considered."

BC Hydro states on page 35 that "energy from the Program does not have a long-run value because it cannot be used to displace or reduce BC Hydro's need to acquire new generation resources, over the

long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.1 Please explain whether there has been a change in circumstance since the inception of the NM program such that the Energy Price should now reflect a short-run value rather than a long-run value. If yes, please elaborate.

RESPONSE:

As discussed in section 1.4.3 of the Application, the Energy Price for excess generation has historically been consistent with the policy direction provided in the 2007 Energy Plan that the Energy Price be generally consistent with the price paid under BC Hydro's Standing Offer Program (SOP).

As a result of the Government of B.C.'s Comprehensive Review of BC Hydro, as referenced in section 4.6 of the Application, BC Hydro indefinitely suspended the SOP in February 2019. In BC Hydro's view, now that the SOP has been indefinitely suspended, the SOP price should no longer be used as a basis for the Energy Price and the Energy Price should be re-evaluated and updated to align with the value BC Hydro receives from excess generation.

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

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

BC Hydro states on page 18 of the Application, "BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use."

On page 34, BC Hydro states, "The link between the SOP price and the Energy Price is based on the premise that the Energy Price should reflect a long-run value instead of a short-run value. BC Hydro believes that this premise is incorrect and should be re-considered."

BC Hydro states on page 35 that "energy from the Program does not have a long-run value because it cannot be used to displace or reduce BC Hydro's need to acquire new generation resources, over the

long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.2 Please demonstrate how the Net Generation from NM customers provides short-term rather than long-term value to BC Hydro. Specifically, please include the energy profile of energy supplied to BC Hydro by generation type, separating out generation energy, losses, ancillary services, generation capacity and network capacity.

RESPONSE:

In section 4.2 of the Application, BC Hydro indicates that excess generation from customers in the Program cannot have a long-term value because it cannot be used to displace or reduce BC Hydro's need to acquire new generation resources, over the long-term. To clarify, while the Energy Price has historically been based on a long-run value, BC Hydro's reasons for requesting an update to the Energy Price go beyond whether the energy has a short-run or long-run value. Specifically, BC Hydro believes excess generation from customers in the Program should be based on the market value because:

- **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;**

- **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;**

- **BC Hydro is currently in an energy surplus period and does not project the need for new energy resources for many years; and**

- **As discussed further 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 BCUC IR 1.12.4 where we provide a comparison of net generation from customers in the Program to average Mid-C prices in calendar 2018.

The value of energy delivered to BC Hydro by customers in the Program does not necessarily differ among resource types:

- **For the energy profile of energy supplied to BC Hydro from customers in the Program by generation type, please refer to BC Hydro's response to BCUC IR 1.12.4; and**

- **For details on the value of capacity from customers in the Program, please refer to BC Hydro's response to BCUC IR 1.11.2.**

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.

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

BC Hydro states on page 18 of the Application, "BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use."

On page 34, BC Hydro states, "The link between the SOP price and the Energy Price is based on the premise that the Energy Price should reflect a long-run value instead of a short-run value. BC Hydro believes that this premise is incorrect and should be re-considered."

BC Hydro states on page 35 that "energy from the Program does not have a long-run value because it cannot be used to displace or reduce BC Hydro's need to acquire new generation resources, over the

long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.2 Please demonstrate how the Net Generation from NM customers provides short-term rather than long-term value to BC Hydro. Specifically, please include the energy profile of energy supplied to BC Hydro by generation type, separating out generation energy, losses, ancillary services, generation capacity and network capacity.

1.10.2.1 Please explain whether the value of energy delivered to the grid differs among generation types. If yes, please explain any differences and present the short-term and long-term energy value by generation type.

RESPONSE:

The value of energy delivered to the grid by customers in the Program does not necessarily differ among resource types:

- **For the energy profile of energy supplied to BC Hydro from customers in the Program by generation type, please refer to BC Hydro's response to BCUC IR 1.12.4; and**
- **For details on the value of capacity from customers in the Program, please refer to BC Hydro's response to BCUC IR 1.11.2.**

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

BC Hydro states on page 18 of the Application, “BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use.”

On page 34, BC Hydro states, “The link between the SOP price and the Energy Price is based on the premise that the Energy Price should reflect a long-run value instead of a short-run value. BC Hydro believes that this premise is incorrect and should be re-considered.”

BC Hydro states on page 35 that “energy from the Program does not have a long-run value because it cannot be used to displace or reduce BC Hydro’s need to acquire new generation resources, over the

long-term.” And that “the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers.”

1.10.3 Once a customer makes an investment in distributed generation (DG), please estimate (by generator type) the typical life of that DG investment.

RESPONSE:

The life of the initial capital investment in a distributed generation facility is dependent on factors that are controlled by the customer including the equipment quality, installation practices, equipment service conditions, and maintenance practices.

The estimated typical life for a well maintained facility is 25 years for small scale solar photovoltaic, 30 years for micro-hydro, and 20 years for small wind.

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

BC Hydro states on page 18 of the Application, "BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use."

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long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.3 Once a customer makes an investment in distributed generation (DG), please estimate (by generator type) the typical life of that DG investment.

1.10.3.1 Does BC Hydro consider that the energy generated from a distribution connected DG customer with DG should generally be considered long-term or short-term in nature? Please explain.

RESPONSE:

Energy from the customers in Program is energy generated from distribution connected distributed generation customers. Please refer to BC Hydro's response to BCUC IR 1.10.2 with regards to the value of excess generation from customers in the Program.

BC Hydro does purchase energy from non-customer distribution connected distributed generation resources. As discussed in BC Hydro's response to BCUC IR 1.10.5, BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods.

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

BC Hydro states on page 18 of the Application, "BC Hydro believes that Oversized Generating Facilities are similar to an IPP and are not consistent with the intent of the Program to allow individual customers to meet all or part of their electricity demand, with generation limited to their own use."

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long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.4 Please elaborate on the similarities and differences between the energy supplied from Oversized Generating Facilities and IPPs.

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.

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

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long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.5 Please discuss whether BC Hydro considers energy from Independent Power Producers (IPPs) to be short-term or long-term in nature.

RESPONSE:

Energy from IPPs is included in BC Hydro's resource planning and Load Resource Balance. Given potential policy changes that may affect BC Hydro arising from Phase Two of the Comprehensive Review of BC Hydro and other energy related policies, as well as technology cost uncertainty over the long term, BC Hydro 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 BCUC IR 1.10.2 where we explain why BC Hydro believes that the value of excess generation delivered to BC Hydro by customers in the Program should be based on the market value.

10.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 18, 34, 35
Long-run versus short-run value

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long-term." And that "the Energy Price on a long-run basis, when the energy received only has a
short-run value, goes beyond limited cost-shifting and does not represent a fair value to non-participating customers."

1.10.5 Please discuss whether BC Hydro considers energy from Independent Power Producers (IPPs) to be short-term or long-term in nature.

1.10.5.1 If energy from IPPs is considered long-term in nature, please explain why energy from NM customer's generation is considered short-term in nature.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.10.2 where we explain why BC Hydro believes that the value of excess generation delivered to BC Hydro by customers in the Program should be based on the market value.

11.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 18–19
Value of Energy from NM customers to BC Hydro

BC Hydro states on pages 18-19 of Appendix F to the Application:

Generally speaking, the economic value of customer self-generation to BC Hydro and non-participating customers is measured in terms of the amount of RS 1289 energy purchased by BC Hydro that can be used to defer purchasing new energy. In addition to the avoided energy value, customer generation may also allow BC Hydro to avoid or defer system costs or regional transmission, such as upgrades to enhance the reliability of the system in a particular area.

1.11.1 Please discuss, and quantify if possible, any benefits to BC Hydro from load reduction and energy supply from NM customers, including capacity savings, energy savings and deferred capital expenditure such as on transmission or generation.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.14.2.1 where we discuss avoided costs with regards to generation from customers in the Program. BC Hydro has not conducted an analysis of avoided transmission costs.

11.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 18–19
Value of Energy from NM customers to BC Hydro

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1.11.1 Please discuss, and quantify if possible, any benefits to BC Hydro from load reduction and energy supply from NM customers, including capacity savings, energy savings and deferred capital expenditure such as on transmission or generation.

1.11.1.1 Please explain whether the benefits to BC Hydro differs depending on the generation type. If so, please elaborate on the differences.

RESPONSE:

BC Hydro has not conducted an analysis to determine whether the benefits to BC Hydro differ depending on generation type. Please refer to BC Hydro's response to BCUC IR 1.14.2.1 where we discuss avoided costs with regards to generation from customers in the Program.

11.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 18–19
Value of Energy from NM customers to BC Hydro

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1.11.2 Does BC Hydro consider that, on an aggregate basis, its NM customer generation can provide generation and network capacity benefits? Please explain.

RESPONSE:

No, BC Hydro does not consider generation from customers in the Program, on an aggregate basis, to provide capacity benefits.

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.

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 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. The potential capacity contribution from customers in the Program would be even less than the potential energy contribution.

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.

1.12.1 Please clarify whether the proposed Surplus Energy Price refers to the daily average Mid-C market price based on light load hours, heavy load hours, or weighted average between light load and heavy load within the day.

RESPONSE:

The proposed Energy Price is based the daily average Mid-Columbia price for the previous calendar year, converted to Canadian dollars, which is a weighted average of light and heavy load hour prices.

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

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1.12.2 Please provide the daily average Mid-C market price during: i) light load hours ii) heavy load hours, and iii) daily average, for each day in the previous year, respectively, in a data table in excel format and in a graph.

RESPONSE:

Attachment 1 provides 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 daily light load hour and heavy load hour data is part of BC Hydro's subscription with Intercontinental Exchange. The information is proprietary to Intercontinental Exchange and BC Hydro is subject to non-disclosure obligations through our subscription agreement. Accordingly, BC Hydro is filing Attachment 1 confidentially with the BCUC.

CONFIDENTIAL ATTACHMENT

FILED WITH BCUC ONLY

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:

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1.12.2 Please provide the daily average Mid-C market price during: i) light load hours ii) heavy load hours, and iii) daily average, for each day in the previous year, respectively, in a data table in excel format and in a graph.

1.12.2.1 Please provide the definition of light load hours and heavy load hours.

RESPONSE:

The Intercontinental Exchange, an exchange for the Mid-C electricity market futures, specifies light load hours and heavy load hours as follows:

- **Heavy Load Hours or "Peak" are hours ending 0700 to 2200 Pacific Prevailing Time, Monday to Saturday, excluding North American Electric Reliability Corporation (NERC) holidays; and**
- **Light Load Hours are all other hours.**

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.

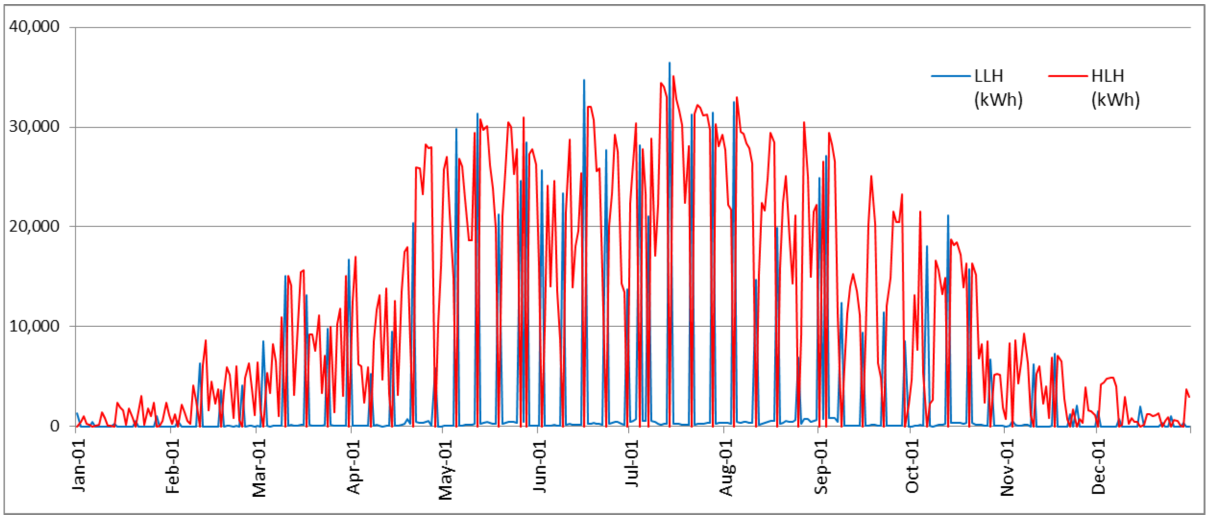
1.12.3 Please provide, in table form and in a line graph, the total daily Net Generation supplied to BC Hydro by NM customers for each day in the previous year during i) light load hours and ii) heavy load hours for each generation type, respectively.

RESPONSE:

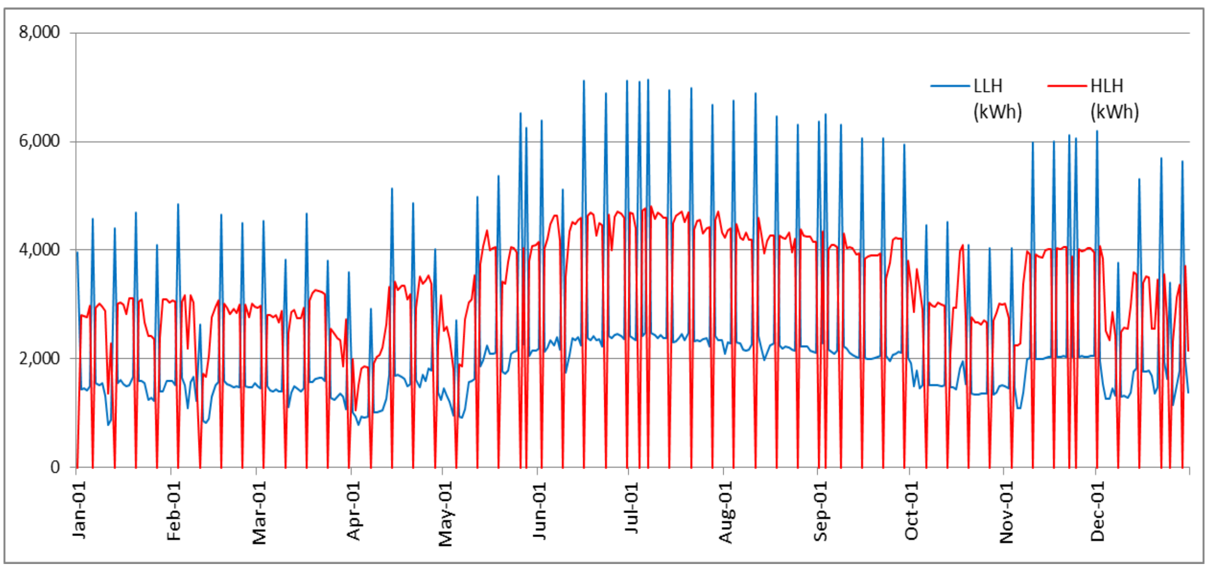
The graphs below provide the total net generation (outflow) for each day in 2018 during Light Load Hours (LLH) and Heavy Load Hours (HLH) for solar PV (including wind, wind and PV, biogas) and hydroelectric generation.

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).

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

	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
Date	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	4,586	0	476	476	0
Jan-07	4,505	1,557	2,948	101	14	87
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	4,395	0	262	262	0
Jan-14	4,559	1,549	3,010	2,372	18	2,354
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	4,692	4,692	0	596	596	0
Jan-21	4,664	1,601	3,063	1,545	17	1,528
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	4,096	0	1,031	1,031	0
Jan-28	3,789	1,396	2,393	94	12	82
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	4,847	0	606	606	0
Feb-04	4,712	1,655	3,057	2,162	13	2,149
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	2,638	0	6,322	6,322	0
Feb-11	2,603	868	1,735	6,147	19	6,128
Feb-12	2,493	823	1,670	8,633	22	8,611
Feb-13	2,956	899	2,057	1,632	13	1,619

	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
Date	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	4,647	0	3,626	3,626	0
Feb-18	4,621	1,603	3,018	3,545	21	3,524
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	4,496	0	4,082	4,082	0
Feb-25	4,491	1,501	2,990	4,959	26	4,933
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	4,531	4,531	0	8,553	8,553	0
Mar-04	4,315	1,503	2,812	5,421	33	5,388
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	3,835	0	15,060	15,060	0
Mar-11	3,600	1,121	2,479	15,236	126	15,110
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	4,667	0	13,132	13,132	0
Mar-18	4,643	1,572	3,071	9,333	141	9,192
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	3,804	0	9,845	9,845	0
Mar-25	3,836	1,278	2,558	10,137	135	10,002
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	3,599	0	16,766	16,766	0

	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
Date	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Apr-01	3,013	1,010	2,003	12,718	97	12,621
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	2,924	2,924	0	5,235	5,235	0
Apr-08	2,945	1,017	1,928	8,660	112	8,548
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	5,143	5,143	0	9,524	9,524	0
Apr-15	5,113	1,695	3,418	12,656	59	12,597
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	4,866	0	20,399	20,399	0
Apr-22	4,566	1,616	2,950	26,385	452	25,933
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	4,028	0	5,876	5,876	0
Apr-29	3,644	1,373	2,271	10,221	21	10,200
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	2,712	0	29,775	29,775	0
May-06	2,838	930	1,908	26,883	32	26,851
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	4,987	4,987	0	31,356	31,356	0
May-13	5,610	1,858	3,752	31,090	311	30,779
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

	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
Date	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	5,365	0	21,254	21,254	0
May-20	5,173	1,759	3,414	21,400	285	21,115
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	6,517	0	24,648	24,648	0
May-27	6,299	2,268	4,031	31,367	422	30,945
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	6,386	0	25,670	25,670	0
Jun-03	6,161	2,127	4,034	9,938	44	9,894
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	5,108	5,108	0	23,336	23,336	0
Jun-10	5,263	1,749	3,514	21,746	193	21,553
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	7,113	0	34,729	34,729	0
Jun-17	7,024	2,380	4,644	32,296	318	31,978
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	6,880	6,880	0	27,711	27,711	0
Jun-24	7,083	2,422	4,661	20,311	238	20,073
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	7,124	7,124	0	13,748	13,748	0
Jul-01	7,117	2,421	4,696	22,785	428	22,357

Date	Hydroelectric Daily (kWh)	Hydroelectric LLH (kWh)	Hydroelectric HLH (kWh)	Solar PV (including wind, wind and PV and biogas) Daily (kWh)	Solar PV (including wind, wind and PV and biogas) LLH (kWh)	Solar PV (including wind, wind and PV and biogas) 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	7,140	0	21,100	21,100	0
Jul-08	7,290	2,485	4,805	29,499	602	28,897
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	6,937	0	36,437	36,437	0
Jul-15	6,815	2,311	4,504	35,368	275	35,093
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	6,978	6,978	0	31,261	31,261	0
Jul-22	6,703	2,323	4,380	31,589	191	31,398
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	6,681	0	31,463	31,463	0
Jul-29	6,971	2,416	4,555	30,557	273	30,284
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	6,744	6,744	0	32,519	32,519	0
Aug-05	6,771	2,298	4,473	33,417	446	32,971
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	6,878	6,878	0	14,710	14,710	0
Aug-12	7,020	2,428	4,592	15,480	202	15,278
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

	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
Date	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	6,467	0	19,925	19,925	0
Aug-19	6,518	2,252	4,266	16,234	315	15,919
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	6,313	0	6,901	6,901	0
Aug-26	6,607	2,224	4,383	9,360	247	9,113
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	6,366	0	24,882	24,882	0
Sep-02	6,627	2,286	4,341	27,241	713	26,528
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	6,313	6,313	0	12,428	12,428	0
Sep-09	6,524	2,225	4,299	5,876	63	5,813
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	6,068	6,068	0	9,442	9,442	0
Sep-16	5,867	2,015	3,852	8,733	72	8,661
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	6,059	0	11,427	11,427	0
Sep-23	5,532	2,051	3,481	12,274	119	12,155
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	5,946	0	8,550	8,550	0
Sep-30	5,822	2,021	3,801	2,257	26	2,231
Oct-01	5,298	1,922	3,376	4,763	20	4,743

	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
Date	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	4,459	0	18,062	18,062	0
Oct-07	4,549	1,517	3,032	2,378	47	2,331
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	4,518	0	21,185	21,185	0
Oct-14	3,581	1,481	2,100	19,062	328	18,734
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	4,096	0	15,756	15,756	0
Oct-21	4,129	1,359	2,770	16,659	328	16,331
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	4,044	0	6,722	6,722	0
Oct-28	4,058	1,347	2,711	5,317	96	5,221
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	4,035	4,035	0	575	575	0
Nov-04	3,725	1,478	2,247	8,772	135	8,637
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	5,991	0	6,278	6,278	0
Nov-11	5,914	1,995	3,919	5,335	24	5,311
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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Date	Hydroelectric			Solar PV (including wind, wind and PV and biogas)		
	Daily (kWh)	LLH (kWh)	HLH (kWh)	Daily (kWh)	LLH (kWh)	HLH (kWh)
Nov-17	6,009	6,009	0	7,261	7,261	0
Nov-18	6,077	2,043	4,034	7,157	30	7,127
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	6,066	0	2,124	2,124	0
Nov-25	6,063	2,044	4,019	782	10	772
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	6,194	6,194	0	1,570	1,570	0
Dec-02	6,035	1,963	4,072	4,273	19	4,254
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	3,765	0	797	797	0
Dec-09	3,796	1,299	2,497	179	4	175
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	5,304	5,304	0	1,961	1,961	0
Dec-16	5,176	1,770	3,406	181	9	172
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	5,686	0	331	331	0
Dec-23	5,487	1,937	3,550	543	8	535
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	5,630	0	411	411	0
Dec-30	5,656	1,951	3,705	3,775	25	3,750
Dec-31	3,539	1,389	2,150	3,023	23	3,000
Total	**1,910,327**	**862,722**	**1,047,605**	**4,935,989**	**893,631**	**4,042,358**

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.

1.12.4 Please explain how the average Mid-C price fairly reflects the value of the energy supplied to BC Hydro. Please include a comparison of the monthly and daily generation profiles of NM energy, by generation type, compared to the Mid-C prices at these times.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.10.2 where we explain why excess generation from customers in the Program should be valued based on the market value.

In the Application, BC Hydro has proposed that the Energy Price be an amount determined every January 1st based on the daily average Mid-C prices for the previous calendar year, converted to Canadian dollars, using the average annual exchange rate from the Bank of Canada for that year.

BC Hydro believes this proposed approach is fair because BC Hydro cannot determine the exact times within a given year that a customer contributed towards their excess generation. Accordingly, an Energy Price based on the annual average Mid-C for the most recent calendar year provides a reasonable approximation. In addition, using historical information provides greater transparency to customers.

A comparison of energy delivered to BC Hydro from customers in the Program to average Mid-C prices in calendar 2018, is provided in the table below. The values in the table represent the sum of all hourly energy delivered to BC Hydro as measured by customer meters.

Month (Calendar Year 2018)	Generation Delivered from Solar[1] Customers in the Program (MWh)	Generation Delivered from Hydro Customers in the Program (MWh)	Average Mid-C Price ($2018 Can/MWh)
January	32	131	27.86
February	93	117	22.70
March	278	131	25.35
April	409	121	18.65
May	804	159	9.16
June	660	201	14.94
July	911	216	68.71
August	716	201	72.30
September	495	184	35.51
October	362	139	53.35
November	118	166	64.40
December	55	145	63.94

In general, energy from customers in the Program with solar Photovoltaic (PV) Generating Facilities is delivered primarily between May and August. If the monthly solar PV energy from customers in the Program were valued at the average monthly Mid-C price in 2018, the average value for solar generation would be $39.9/MWh (3.99 cents per kWh), which is equal to annual average Mid-C price of $39.9/MWh (3.99 cents per kWh).

If the monthly hydro generation were valued at the average monthly Mid-C price, the average value for hydro generation would be $41.6/MWh (4.16 cents per kWh), which is very close to the annual average Mid-C price of $39.9/MWh (3.99 cents per kWh).

[1] **Includes all non-hydro customers in the Program.**

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1.12.5 Please provide the annual average of the daily average Mid-C market price in the past 10 years, in US dollars and Canadian dollars, respectively, as well as the average annual exchange rate from the Bank of Canada for each of the past 10 years.

RESPONSE:

Attachment 1 provides the annual average of the daily average Mid-C market price in the past 10 years, in US dollars and Canadian dollars as well as the average annual exchange rate from the Bank of Canada, for each of the past 10 years.

Historical Annual Mid-C Prices (US and CAD) and Historical Bank of Canada Exchange Rates

Year	Mid-C Price (Nominal USD/MWh)	Exchange Rate[1]	Mid-C Price (Nominal CAD/MWh)
2009	$32.60	1.142	$37.23
2010	$32.81	1.030	$33.79
2011	$23.82	0.989	$23.56
2012	$19.25	1.000	$19.24
2013	$32.55	1.030	$33.52
2014	$33.63	1.104	$37.14
2015	$23.50	1.279	$30.05
2016	$20.28	1.325	$26.87
2017	$21.89	1.299	$28.43
2018	$30.76	1.296	$39.86
10 Year Average	$27.11	1.15	$30.97
Standard Deviation	$5.85	0.14	$6.56
Standard Deviation as a % of 10 Year Average	22%	12%	21%

1. Annual Average Exchange Rates from Bank of Canada website:
https://www.bankofcanada.ca/rates/exchange/legacy-noon-and-closing-rates/
https://www.bankofcanada.ca/rates/exchange/annual-average-exchange-rates/


Mid-C Price (Nominal USD/MWh)
Mid-C Price (Nominal $/MWh)
$45
$40
$35
$30
$25
$20
$15
$10
$5
$-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

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1.12.5 Please provide the annual average of the daily average Mid-C market price in the past 10 years, in US dollars and Canadian dollars, respectively, as well as the average annual exchange rate from the Bank of Canada for each of the past 10 years.

1.12.5.1 Please comment on the year-to-year volatility in the annual average daily Mid-C price presented above.

RESPONSE:

A common metric of volatility is standard deviation, which is a measure of the dispersion of a set of values around their average. The average annual Mid-C price (in Nominal US dollars) over the past 10 years was $27.11/MWh with a standard deviation of $5.85/MWh or 22 per cent of the average.

Please also refer to the attachment included as part of BC Hydro's response to BCUC IR 1.12.5 for a visual representation of year-to-year volatility.

12.0 D. PRICE OF SURPLUS ENERGY

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1.12.5 Please provide the annual average of the daily average Mid-C market price in the past 10 years, in US dollars and Canadian dollars, respectively, as well as the average annual exchange rate from the Bank of Canada for each of the past 10 years.

1.12.5.2 Please discuss how much of the volatility in the average Mid-C price in Canadian dollars is due to currency volatility.

RESPONSE:

As shown in the attachment provided in BC Hydro's response to BCUC IR 1.12.5, the standard deviation of the Mid-C price (in Nominal Canadian dollars) over the past 10 years is $6.56/MWh. This value represents 21 per cent of the average 10-year price in Canadian dollars compared to a corresponding value of 22 per cent for the Mid-C price in US dollars. In addition, the exchange rate over the past 10 years has a standard deviation of 0.14, which represents 12 per cent of the 10 year average exchange rate.

BC Hydro believes that the exchange rate and annual Mid-C prices are largely independent. Therefore, depending on the historic time frame considered, the exchange rate can have the effect of either increasing or reducing the volatility of the Mid-C price when expressed in Canadian dollars (as compared to the Mid-C price in US dollars).

12.0 D. PRICE OF SURPLUS ENERGY

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1.12.5 Please provide the annual average of the daily average Mid-C market price in the past 10 years, in US dollars and Canadian dollars, respectively, as well as the average annual exchange rate from the Bank of Canada for each of the past 10 years.

1.12.5.3 Please explain whether, and if so how, BC Hydro addresses currency risk associated with the Mid-C price.

RESPONSE:

BC Hydro does not directly address currency risk associated with the proposed Energy Price; however, given the amount of energy and the degree of price variation from currency exchange fluctuations, BC Hydro expects the associated risk to be minimal.

12.0 D. PRICE OF SURPLUS ENERGY

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1.12.6 Please confirm, or explain otherwise, that the proposed Surplus Energy Price will change from year to year, depending on the average of the daily average Mid-Columbia market prices and exchange rate over the previous calendar year.

RESPONSE:

Confirmed.

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

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1.12.6 Please confirm, or explain otherwise, that the proposed Surplus Energy Price will change from year to year, depending on the average of the daily average Mid-Columbia market prices and exchange rate over the previous calendar year.

1.12.6.1 If confirmed, please discuss any anticipated challenges regarding: i) rate stability and ii) customer acceptance and understanding from the unpredictability in the Surplus Energy Price due to anticipated annual adjustments.

RESPONSE:

With regards to the statement in the preamble "an amount that reflects the price BC Hydro can sell the electricity for on the regional wholesale market", BC Hydro clarifies that BC Hydro does not buy or sell electricity in the regional wholesale market. Rather, BC Hydro's subsidiary Powerex buys and sells electricity in the regional wholesale market in accordance with transfer pricing arrangements as between BC Hydro and Powerex.

BC Hydro recognizes that an annual update to the Energy Price may create some challenges with regards to rate stability and customer acceptance and understanding. That said, BC Hydro believes that an annual update to the Energy Price appropriately balances these concerns against the objective of reflecting the value of the energy to non-participating customers. Less frequent updates to the Energy Price (i.e., more than a year between updates) could increase rate stability and potentially customer acceptance and understanding, but would also make the

Energy Price less reflective of the value of the energy to non-participating customers.

By comparison, more frequent updates to the Energy Price (i.e., real-time, daily or monthly) would likely decrease rate stability and customer acceptance and understanding, but would make the Energy Price more reflective of the value of the energy to non-participating customers.

Please refer to BC Hydro's response to BCUC IR 1.12.7 where we state that including a threshold difference between the average Mid-C price and the Energy Price that would trigger the need for an adjustment to the Energy Price may help to mitigate challenges with regards to rate stability and customer acceptance and understanding while still reflecting the value that BC Hydro receives from excess generation.

Please also refer to BC Hydro's response to BCUC IR 1.12.5.1, where we explain that the standard deviation of the average annual Mid-C price over the past 10 years was 22 per cent of the average.

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1.12.7 Please discuss the pros and cons of adjusting the Surplus Energy Price only if the annual average of the daily average Mid-C market price deviates from the previous year's annual average by a threshold difference (either a c/kWh difference or a percentage difference).

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.12.6.1 where we explain that less frequent updates to the Energy Price could increase rate stability and customer acceptance and understanding but would also make the Energy Price less reflective of the value of the energy to non-participating customers.

Adjusting the Energy Price only if the annual average of the daily average Mid-C market price deviates from the previous year's annual average by a threshold difference may have similar benefits with regards to increasing rate stability and customer acceptance and understanding while limiting the extent to which the Energy Price deviates from the value of the energy to non-participating customers, provided that the threshold was set appropriately.

Please refer to BC Hydro's response to BCUC IR 12.7.1 where we discuss an appropriate threshold range.

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1.12.7 Please discuss the pros and cons of adjusting the Surplus Energy Price only if the annual average of the daily average Mid-C market price deviates from the previous year's annual average by a threshold difference (either a c/kWh difference or a percentage difference).

1.12.7.1 Please comment on whether BC Hydro would be amenable to including a threshold difference between the average Mid-C price and the Surplus Energy Price that would trigger the need for an adjustment to the Surplus Energy Price. If so, please provide and explain the range of the threshold that BC Hydro considers appropriate.

RESPONSE:

In BC Hydro's view, including a threshold difference between the average Mid-C price and the Energy Price that would trigger the need for an adjustment to the Energy Price may not be beneficial to customers. For example, while including a threshold difference may help to mitigate challenges with regards to rate stability, it could also increase volatility when changes do occur because holding the Energy Price constant in one year could result in a larger adjustment if the threshold was triggered in the following year.

That said, if supported by customers, BC Hydro could include a threshold difference between the average Mid-C price (from the previous calendar year) and the current Energy Price that would trigger the need for an adjustment to the Energy Price.

Attachment 1 to BC Hydro's response to BCUC IR 1.12.5 shows that the standard deviation of the average annual Mid-C price (in Nominal US dollars) over the past 10 years was $5.85/MWh or 0.585 cents per kWh. Accordingly, a threshold range of plus/minus 0.5 cents per kWh may be appropriate.

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.

1.12.8 Please discuss BC Hydro's communications plan to its NM customers regarding what the Energy Price will be for the upcoming year.

RESPONSE:

While BC Hydro has not yet developed a detailed communications plan or timeline for the annual update to the Energy Price, we expect that the update to the Energy Price would be calculated, communicated and implemented in January of each calendar year. Specifically:

- **BC Hydro expects to complete the calculation of the updated Energy Price in early January of each year;**
- **Once the updated Energy Price has been determined, BC Hydro would notify customers in the Program via email and post the revised price on the Program web site; and**
- **The updated Energy Price would be reflected on customer bills with an effective date of January 1. Bills would be settled once the updated Energy Price is reflected in our billing system.**

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.

1.12.9 Please provide a detailed timeline regarding the change in Surplus Energy Price every year, from the calculation of the annual average of daily Mid-C price, communication to customers, to the implementation of the revised Surplus Energy Price.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.12.8 where we discuss the expected timeline for the annual update to the Energy Price.

13.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Order G-63-18, Appendix A, p. 11; BC Hydro electric tariff, p. 5-36
Alternative options to value surplus energy

On Page 11 to Appendix A to Order G-63-18 states, "The Panel finds that the RS 3808 Tranche 1 rate is a reasonable proxy for the cost of FBC's energy supply alternatives; it reflects the non-firm nature of the energy generated; and it sends a pricing signal that is more closely aligned with the design of the NM program to offset own consumption." The current RS 3808 Tranche 1 rate is at 5.098 ¢ per kWh as of April 24, 2019.

1.13.1 Please explain in table form the advantages/disadvantages of using the following values as a proxy for the value of Surplus Energy delivered to the grid by BC Hydro NM customers. In all cases please provide a ₵/kWh estimate of the amount that would be paid and whether they represent *delivered* energy values (i.e. include transmission and distribution line losses):

- Zero;
- Status quo;
- BC Hydro's proposal (average of the daily average Mid-Columbia market prices over the previous calendar year);
- FBC's price of net excess generation (BC Hydro RS 3808 Tranche 1); and
- BC Hydro LRMC used for the DSM Application contained in Chapter 10 to BC Hydro's F2020-2021 Revenue Requirement Application (excluding capacity).

RESPONSE:

The table below provides a discussion of the advantages and disadvantages of the values referenced in the question with regards to the Energy Price. Except as otherwise noted, the values below exclude line losses and wheeling charges.

As discussed in BC Hydro's response to BCUC IR 1.13.2, RS 3808 Tranche 1 does not represent a value of energy to BC Hydro and accordingly, BC Hydro has not included it in the table below.

Energy Price	Advantages	Disadvantages
Zero (₵0 / kWh)	• **Stable from year to year.** • **Promotes customer behavior aligned with the load offset purpose of the Program.**	• **Undervalues the energy delivered to BC Hydro on average, which customers in the Program may perceive as unfair.**
Status Quo (₵9.99/kWh) (In part, includes delivery costs to the Lower Mainland. Does not include capacity.)	• **Stable from year to year.**	• **Promotes customer behaviour counter to the load offset purpose of the Program.** • **Overvalues the energy delivered to BC Hydro on average.** • **Tied to a price for a program that has been indefinitely suspended, as discussed in BC Hydro's response to BCUC IR 1.10.1.** • **Inconsistent with BC Hydro's current interim assumption for evaluating energy during surplus and deficit periods as discussed in BC Hydro's response to BCUC IR 1.10.5.**
BC Hydro's Proposal (Daily Average Mid-C Price for the Previous Calendar Year) (₵3.99/kWh based on calendar year 2018 data)	• **Reflects a reasonable value for energy delivered to BC Hydro from customers in the Program.** • **Promotes customer behavior aligned with the load offset purpose of the Program.**	• **After the 5-year transition period, customers in the Program who receive consistent and significant Surplus Energy Payments will have some uncertainty with regards to the Energy Price to be applied each year.**
LRMC used for Total Resource Cost test in Fiscal 2020 to Fiscal 2021 Revenue Requirements Application (₵10.5/kWh) (includes delivery costs to the Lower Mainland and does not include capacity)	• **None**	• **Promotes customer behaviour counter to the load offset purpose of the Program** • **Incorrect and outdated value.** • **Overvalues the energy delivered to BC Hydro on average.** • **Inconsistent with BC Hydro's current interim assumption for evaluating energy during surplus and deficit periods as discussed in BC Hydro's response to BCUC IR 1.10.5.**

13.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Order G-63-18, Appendix A, p. 11; BC Hydro electric tariff, p. 5-36
Alternative options to value surplus energy

On Page 11 to Appendix A to Order G-63-18 states, “The Panel finds that the RS 3808 Tranche 1 rate is a reasonable proxy for the cost of FBC’s energy supply alternatives; it reflects the non-firm nature of the energy generated; and it sends a pricing signal that is more closely aligned with the design of the NM program to offset own consumption.” The current RS 3808 Tranche 1 rate is at 5.098 ¢ per kWh as of April 24, 2019.

1.13.2 Please explain the value of energy represented by BC Hydro’s RS 3808 Tranche 1 rate and discuss how the RS 3808 Tranche 1 rate compare to the “true value” of energy supplied to BC Hydro under the NM program.

RESPONSE:

The value represented in RS 3808 Tranche 1 is a price of energy supplied to FortisBC, not BC Hydro. RS 3808 is a price signal to FortisBC with respect to its supply of energy.

For BC Hydro, RS 3808 is the rate by which we provide service to FortisBC under the Power Purchase Agreement. This rate does not represent a value of energy to BC Hydro.

The value of intermittent, non-firm energy to BC Hydro (e.g., excess generation from customers in the Program) is generally based on the Mid-C market price because it will generally result in incremental sales (exports) or decreased purchase (imports) activity with Powerex.

14.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 23–24
Value of energy storage to NM customer

On pages 23 to 24 of Appendix F to the Application, BC Hydro presents the Net Metering Evaluation Report No. 4. BC Hydro produces a Net Metering Energy Charge/Credit and Analysis of Residential Service Customers (RS 1101) and Small General Service Customer (RS 1300) in Table 4 and Table 5, respectively.

1.14.1 Please reproduce Table 4 and Table 5 in the Net Metering Evaluation Report No. 4 with information available to date.

RESPONSE:

Tables 4 and 5 from Net Metering Evaluation Report No. 4, updated with current information, are provided below. The tables have been updated using average annual consumption for fiscal 2018 and the approved interim rates for fiscal 2020 from BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application. The tables were prepared using high level assumptions for customer load and generation profiles, and are intended to provide directional information only.

The average residential customer consumption in fiscal 2018 was approximately 9,746 kWh per year or 1,624 kWh bi-monthly. Updated Table 4 below provides a simple example of estimated bill amounts at different percentages of customer self-generation to load percentage for the Energy Charge[1] portion only (before any applicable taxes) for the average residential customer under RS 1101 with a bi-monthly load of 1,624 kWh using the interim approved fiscal 2020 rate of $0.0945 per kWh for the first 1,350 kWh of consumption in the billing period and $0.1417 per kWh for consumption above 1,350 kWh in the billing period. The table also shows the value of the Energy Charge/Credit, expressed in $ per kWh. The table totals may not add due to rounding.

[1] Energy Charge is defined in Rate Schedule 1289 as charges for Net Energy consumed by the Customer in accordance with the Rate Schedule under which the Customer is receiving Service from BC Hydro.

Updated Table 4 Bill Example for Residential Service Customer

	Net Metering Energy Charge/Credit and Analysis RS 1101 Residential Service Customer				
Percentage of Customer Self-Generation to Load (%)	**0**	**25**	**50**	**75**	**100**
Customer Bi-monthly Load (kWh)	**1,624**	**1,624**	**1,624**	**1,624**	**1,624**
Customer Bi-monthly Self-Generation (kWh)	**0**	**406**	**812**	**1,218**	**1,624**
Customer Bi-monthly Load Net of Self-Generation (kWh)	**1,624**	**1,218**	**812**	**406**	**0**
RS 1101 Energy Charge Step 1 – first 1,350 kWh ($0.0945/kWh)	**128**	**115**	**77**	**38**	**0**
RS 1101 Energy Charge Step 2 ($0.1417/kWh)	**39**	**0**	**0**	**0**	**0**
Bi-Monthly RS 1101 Energy Charge Total ($)	**167**	**115**	**77**	**38**	**0**
Annual RS 1101 Energy Charge Total ($)	**998**	**690**	**460**	**230**	**0**
Estimated RS 1289 Energy Charge/Credit per Annum ($)[2]	**0**	**308**	**538**	**768**	**998**
Estimated RS 1289 Energy Charge/Credit ($/kWh)[3]	**0**	**0.126**	**0.1104**	**0.105**	**0.102**

The average Small General Service customer consumption in fiscal 2018 was approximately 21,900 kWh per year or 3,650 kWh bi-monthly. Updated Table 5 below shows a simple example of an estimated bill amount for the Energy Charge[3] portion only (before any applicable taxes) for the average Small General Service customer under RS 1300 with a bi-monthly load of 3,650 kWh, using the interim approved fiscal 2020 rate of $0.1253 per kWh. The table also shows the value of the Energy Charge/Credit, expressed in $ per kWh. The table totals may not add due to rounding.

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[2] **Calculated as the difference between Annual RS 1101 Energy Charge Total ($) at 0 per cent self-generation and the Annual RS 1101 Energy Charge Total ($) self-generated (e.g., for 25 per cent self-generation the calculation would be $998 - $690 = $308).**

[3] **Unit value ($/kWh) calculated as the Estimated RS 1289 Energy Charge/Credit per Annum ($) divided by Customer Bi-monthly Self Generation (kWh) multiplied by six billing periods in a year (e.g., for 25 per cent self-generation the calculation would be $308/(406 kWh X 6 billing periods) = $.126/kWh).**

Updated Table 5 Bill Example for Small General Service Customer

	Net Metering Energy Charge/Credit and Analysis RS 1300 Small General Service Customer				
Percentage of Customer Self-Generation to Load (%)	**0**	**25**	**50**	**75**	**100**
Customer Bi-monthly Load (kWh)	**3,650**	**3,650**	**3,650**	**3,650**	**3,650**
Customer Bi-monthly Self-Generation (kWh)	**0**	**912**	**1,825**	**2,738**	**3,650**
Customer Bi-monthly Load Net of Self-Generation (kWh)	**3,650**	**2,738**	**1,825**	**912**	**0**
RS 1300 Energy Charge ($0.1253/kWh)	**457**	**343**	**229**	**114**	**0**
Bi-Monthly RS 1300 Energy Charge Total ($)	**457**	**343**	**229**	**114**	**0**
Annual RS 1300 Energy Charge Total ($)	**2,744**	**2,058**	**1,372**	**686**	**0**
Estimated RS 1289 Energy Charge/Credit per Annum ($)[4]	**0**	**686**	**1,372**	**2,058**	**2,744**
Estimated RS 1289 Energy Charge/Credit ($/kWh)[5]	**0**	**0.1253**	**0.1253**	**0.1253**	**0.1253**

Based on high level assumptions for customer load and generation, the above tables indicate that:

- **A typical residential customer would receive an Energy Credit of between 10.2 cents per kWh and 12.6 cents per kWh, depending on the amount of energy generated; and**
- **A typical Small General Service customer would receive an Energy Credit equivalent to the same 12.5 cents per kWh rate they currently pay for electricity from BC Hydro.**

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[4] **Calculated as the difference between Annual RS 1300 Energy Charge Total ($) at 0 per cent self-generation and the Annual RS 1300 Energy Charge Total ($) self-generated (e.g., for 25 per cent self-generation the calculation would be $2,744 - $2058 = $686).**

[5] **Unit value ($/kWh) calculated as the Estimated RS 1289 Energy Charge/Credit per Annum ($) divided by Customer Bi-monthly Self Generation (kWh) multiplied by six billing periods in a year (e.g., for 25 per cent self-generation the calculation would be $686/(912kWh X 6 billing periods) = $.1253/kWh).**

14.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 23–24
Value of energy storage to NM customer

On pages 23 to 24 of Appendix F to the Application, BC Hydro presents the Net Metering Evaluation Report No. 4. BC Hydro produces a Net Metering Energy Charge/Credit and Analysis of Residential Service Customers (RS 1101) and Small General Service Customer (RS 1300) in Table 4 and Table 5, respectively.

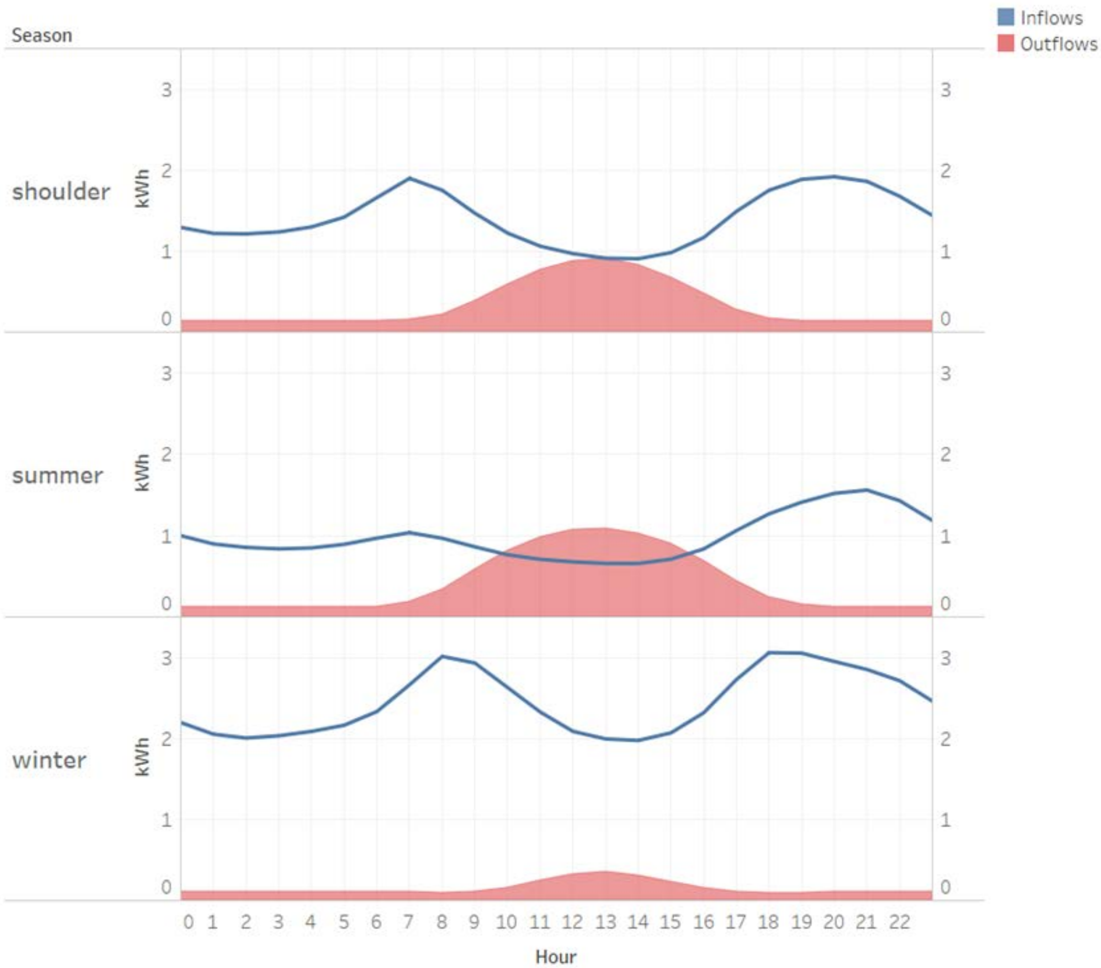
1.14.2 Please compare NM customers' generation and consumption patterns as observed by BC Hydro. Please include data by rate class and by generation source, respectively.

RESPONSE:

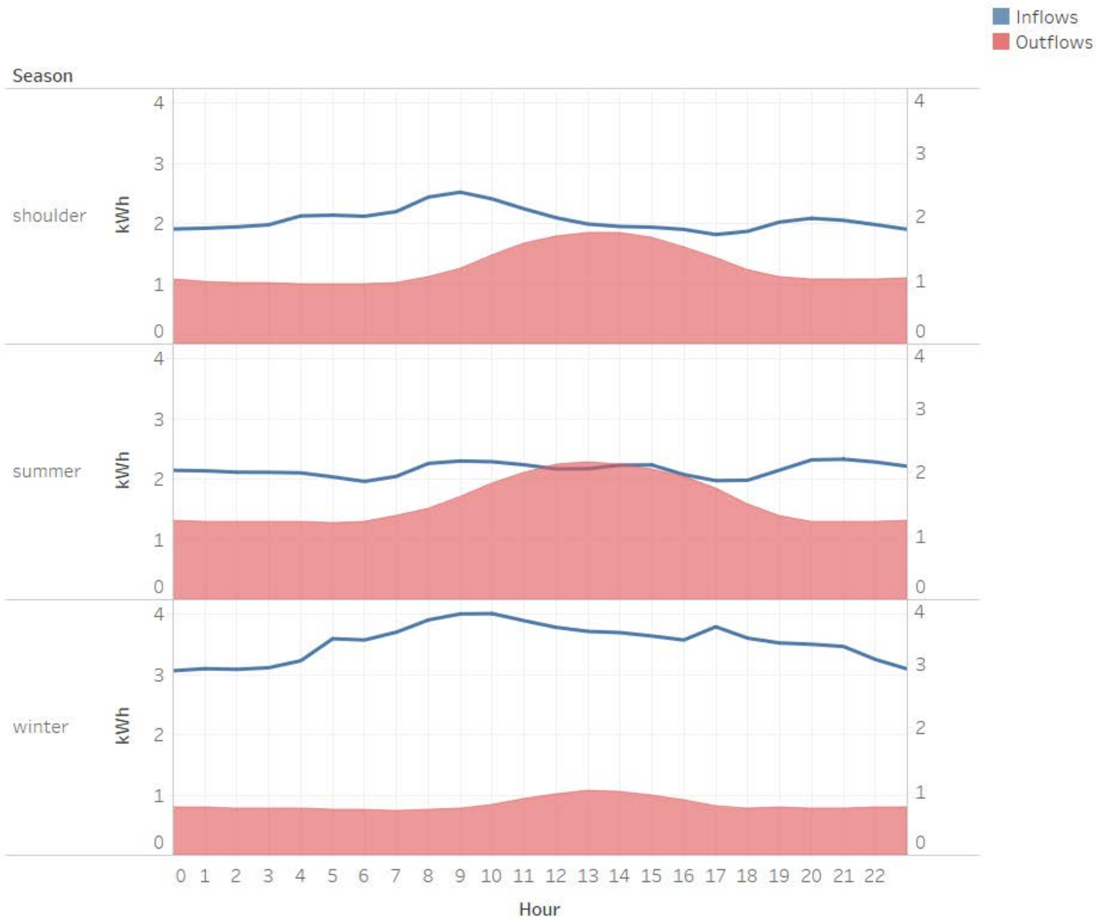
The Program does not require a customer's Generating Facility be separately metered. Current revenue metering measures a customer's net consumption and net generation.

The following graphs provide net consumption (inflow) and net generation (outflow) patterns, by season, for residential customers in the Program, based on fiscal 2016 data.

98 per cent of customers in the Program have a solar PV Generating Facility.



The following graphs provide net consumption (inflow) and net generation (outflow) patterns, by season, for Small General Service customers in the Program, based on fiscal 2016 data.



Inflows
Outflows
Season
shoulder
summer
winter
kWh
0
1
2
3
4
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Hour

14.0 D. PRICE OF SURPLUS ENERGY

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1.14.2 Please compare NM customers' generation and consumption patterns as observed by BC Hydro. Please include data by rate class and by generation source, respectively.

1.14.2.1 Based on the information presented above, please discuss whether there is a difference between the value of Net Generation supplied to BC Hydro versus BC Hydro's cost to meet the NM customers' Net Consumption on a real-time basis.

RESPONSE:

Yes, there is a difference between the value of energy delivered to BC Hydro from customers in the Program and BC Hydro's cost to serve those customers.

As illustrated in BC Hydro's response to BCUC IR 1.14.2:

- **Generation from residential customers in the Program is delivered to BC Hydro primarily in the daytime, during the summer and shoulder season. These times do not coincide with BC Hydro's peak demand period or the residential class non-coincident peak period. As a result, generation from residential customers in the Program provides energy value only and does not result in any avoided demand-related costs; and**
- **Some generation from Small General Service customers in the Program is delivered in the winter and evenings which may result in some avoided demand-related costs.**

14.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 23–24
Value of energy storage to NM customer

On pages 23 to 24 of Appendix F to the Application, BC Hydro presents the Net Metering Evaluation Report No. 4. BC Hydro produces a Net Metering Energy Charge/Credit and Analysis of Residential Service Customers (RS 1101) and Small General Service Customer (RS 1300) in Table 4 and Table 5, respectively.

1.14.3 Please explain in detail, from a BC Hydro energy system management perspective, how BC Hydro facilitates the ability for NM customers to “store” Net Generation as a credit on the Generation Account to meet future Net Consumption.

RESPONSE:

BC Hydro does not provide storage on its system. Rather, through the Program, BC Hydro provides an accounting mechanism that allows a customer in the Program to apply credits from their excess generation against their consumption.

BC Hydro does not directly meter how much electricity a net metering customer generates. Rather, BC Hydro only meters the amount of electricity that is delivered by the customer to BC Hydro’s system and the amount of electricity that BC Hydro delivers to the customer.

If the total energy delivered to BC Hydro is greater than the energy delivered to the customer within a given billing period, a credit is applied to the Customer’s Generation Account. This credit has the effect of reducing the customer’s subsequent bill(s) for Service. Any remaining balance in the Customer’s Generation Account at the Anniversary Date is purchased by BC Hydro at the Energy Price.

14.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, Appendix F, pp. 23–24
Value of energy storage to NM customer

On pages 23 to 24 of Appendix F to the Application, BC Hydro presents the Net Metering Evaluation Report No. 4. BC Hydro produces a Net Metering Energy Charge/Credit and Analysis of Residential Service Customers (RS 1101) and Small General Service Customer (RS 1300) in Table 4 and Table 5, respectively.

1.14.3 Please explain in detail, from a BC Hydro energy system management perspective, how BC Hydro facilitates the ability for NM customers to “store” Net Generation as a credit on the Generation Account to meet future Net Consumption.

1.14.3.1 Please discuss, and quantify where possible, if there is any cost to BC Hydro and other non-participants associated with providing NM customers with “storage” that allows a NM customer to generate excess in one time period for future consumption.

RESPONSE:

As discussed in BC Hydro’s response to BCUC IR 1.14.3, BC Hydro does not provide storage on its system. Rather, through the Program, BC Hydro provides an accounting mechanism that allows a customer in the Program to apply credits from their excess generation against their consumption.

The financial value of the credit depends on the Rate Schedule applicable to the customer as well as factors such as the customer’s consumption. Please refer to BC Hydro’s response to BCUC IR 1.5.2.2 which provides illustrative examples of the cost-shifting that occurs from the ability of customers in the Program to accumulate a Generation Account Balance to apply against subsequent bill(s).

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
Transition for existing customers

Page 6-2 of the revised tariff as included in Appendix B to the Application states that "This transitional

Energy Price will expire on April 30, 2024. After April 30, 2024, all Customers receiving Service under this Rate Schedule will be paid the Energy Price described in (a), above." BC Hydro also states on page 44 of the Application that "During this five-year period, BC Hydro will monitor the impact of the proposed changes to determine if further measures are required."

BC Hydro states on page 45 of the Application that "in fiscal 2018, the vast majority of customers in the Program (1,044 or 80 per cent) received no Surplus Energy Payment and of the 256 customers who received a Surplus Energy Payment, 215 or 84 per cent received a payment of less than $500."

BC Hydro also states on page 47 that it "believes that providing a transitional Energy Price for a five-year period strikes a fair balance between existing customers and other ratepayers, <u>recognizing that existing customers in the Program have incurred significant capital investments</u> and that changing the basis of the Energy Price from a long-run to a short-run value, is a significant change." [emphasis added]

Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.1 Please explain the rationale for proposing a 5-year transition period, including what other alternative durations were contemplated and the reason why the alternatives are, in BC Hydro's view, less favorable to the proposed duration of the transition period.

RESPONSE:

BC Hydro considered the following options for a transitional Energy Price:

- **Option 1 – Transitional Energy Price for five years (proposed);**

- **Option 2 – Transitional Energy Price for 10 years (or longer);**
- **Option 3 – No transitional Energy Price but provide a one-time payment to customers who can demonstrate that the updated Energy Price would prevent the recovery of their initial and reasonable capital investment; and**
- **Option 4 – No transitional Energy Price or payment**

In BC Hydro's view, Option 1 strikes the right balance between transitioning to an Energy Price that more fairly allocates the benefits and costs of the Program between participating and non-participating customers and mitigating the impact of the change to existing customers in the Program by providing notice to those customers. In the Engagement Survey, 69 per cent of participants expressed support for this option.

Option 2 is less favourable to Option 1 because it skews that balance by further delaying the overall application of an Energy Price that improves fairness between participating and non-participating customers.

Option 4 is less favourable to Option 1 because it skews that balance by providing no transitional period to existing customers in the Program.

Option 3 is less favourable than Option 1 because it would be difficult to administer, particularly with regards to obtaining and verifying the information required to determine any payments. In addition, it is not possible to know whether, and to what extent, the changes proposed in the Application may prevent the recovery of a customer's initial capital investment over time because:

- **The proposed update to the Energy Price would result in a change to the Energy Price each year; and**
- **Assigning all customers a default Anniversary Date of March 1 and allowing customers to choose their own Anniversary Date once would provide all customers in the Program with increased opportunities and flexibility to apply their Generation Account Balance to reduce their supply from BC Hydro.**

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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1.15.1 Please explain the rationale for proposing a 5-year transition period, including what other alternative durations were contemplated and the reason why the alternatives are, in BC Hydro's view, less favorable to the proposed duration of the transition period.

1.15.1.1 Please discuss whether BC Hydro sought input from existing or potential NM customers on the contemplated alternatives identified above.

RESPONSE:

BC Hydro did not specifically seek input from existing or potential Net Metering customers on the alternatives identified in BC Hydro's response to BCUC IR 1.15.1. Rather, BC Hydro proposed Option 1 in the Engagement Survey and used the written comments received in response to that proposal to develop the alternatives. BC Hydro considered these alternatives but decided to include Option 1 in the Application for the reasons outlined in BC Hydro's response to BCUC IR 1.15.1.

15.0 D. PRICE OF SURPLUS ENERGY

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Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.1 Please explain the rationale for proposing a 5-year transition period, including what other alternative durations were contemplated and the reason why the alternatives are, in BC Hydro's view, less favorable to the proposed duration of the transition period.

1.15.1.2 Please explain whether any other transition options were presented to customers and stakeholders during BC Hydro's consultation process.

RESPONSE:

BC Hydro did not present other transition options during the consultation process. Rather, BC Hydro proposed Option 1 in the Engagement Survey and used the written comments received in response to that proposal to develop alternatives. BC Hydro considered these alternatives but decided to include Option 1 in the Application for the reasons outlined in BC Hydro's response to BCUC IR 1.15.1.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.2 Please explain why an expiry date has been proposed for the Tariff considering BC Hydro has indicated that further review will be conducted at the end of the 5-year period.

RESPONSE:

BC Hydro has proposed an expiry date for the transitional Energy Price because BC Hydro believes that a five year transition period strikes the right balance between mitigating the impact on existing customers in the Program and transitioning to an Energy Price that more fairly allocates the benefits and costs of the Program between customers in the Program and non-participating customers.

A five year transition period provides existing customers with notice of the update to the Energy Price. A transition period of undefined duration is less likely to encourage those customers to plan for a change to the Energy Price.

BC Hydro has committed to monitor the impact of the changes proposed in the Application so that further measures may be considered based on the actual impact to existing customers in the Program.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
Transition for existing customers

Page 6-2 of the revised tariff as included in Appendix B to the Application states that "This transitional

Energy Price will expire on April 30, 2024. After April 30, 2024, all Customers receiving Service under this Rate Schedule will be paid the Energy Price described in (a), above." BC Hydro also states on page 44 of the Application that "During this five-year period, BC Hydro will monitor the impact of the proposed changes to determine if further measures are required."

BC Hydro states on page 45 of the Application that "in fiscal 2018, the vast majority of customers in the Program (1,044 or 80 per cent) received no Surplus Energy Payment and of the 256 customers who received a Surplus Energy Payment, 215 or 84 per cent received a payment of less than $500."

BC Hydro also states on page 47 that it "believes that providing a transitional Energy Price for a five-year period strikes a fair balance between existing customers and other ratepayers, <u>recognizing that existing customers in the Program have incurred significant capital investments</u> and that changing the basis of the Energy Price from a long-run to a short-run value, is a significant change." [emphasis added]

Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.3 Please explain if the expiry date was communicated to participants in the Webinar or the Engagement survey.

RESPONSE:

BC Hydro did not communicate a proposed expiry date in the Webinar or the Engagement Survey but did seek feedback on a provision that would maintain the current Energy Price for existing customers in the Program for a period of up to five years.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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BC Hydro also states on page 47 that it "believes that providing a transitional Energy Price for a five-year period strikes a fair balance between existing customers and other ratepayers, <u>recognizing that existing customers in the Program have incurred significant capital investments</u> and that changing the basis of the Energy Price from a long-run to a short-run value, is a significant change." [emphasis added]

Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.4 Please provide the number of customers who entered the NM program prior to April 20, 2018 and identify how many of them had Surplus Energy eligible for payout in the full year immediately preceding April 20, 2018.

RESPONSE:

As of April 20, 2018, BC Hydro had 1,352 customers in the Program.

Customers are eligible to receive a Surplus Energy Payment on their first Anniversary Date (one year after receiving approval to connect their Generating Facility), and on each Anniversary Date thereafter. From April 20, 2017 to April 19, 2018, 253 customers received a Surplus Energy Payment. In fiscal 2019

(April 1, 2018 to March 31, 2019), 400 customers received a Surplus Energy Payment.

For further information on Surplus Energy Payments provided under the Program, please refer to BC Hydro’s response to BCUC IR 1.3.4.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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1.15.4 Please provide the number of customers who entered the NM program prior to April 20, 2018 and identify how many of them had Surplus Energy eligible for payout in the full year immediately preceding April 20, 2018.

1.15.4.1 Assuming the consumption and generation pattern of the NM customers who are eligible for payout identified above remain the same in the future, please provide the estimated financial impact to i) the affected NM customers, and ii) to BC Hydro (and its ratepayers) if the transition period was 0 (i.e. no transition period), 1, 2, 3, 4, and 5 years from April 20, 2018, respectively.

RESPONSE:

The table below provides total Surplus Energy Payment amounts from fiscal 2020 to fiscal 2024, assuming that over that period, the same 400 customers, as identified in BC Hydro's response to BCUC IR 1.15.4, continue to deliver the same Surplus Energy amount of 3,681,154 kWh per year.

For the purposes of the table, the transitional Energy Price is 9.99 cents per kWh and the updated Energy Price is assumed to be 3.99 cents per kWh (based on BC Hydro's proposed approach, applied to calendar year 2018).

Transition Period (years)	Estimated Total Surplus Energy Payments					Cumulative Total of Surplus Energy Payments ($)
	Fiscal 2020 ($)	Fiscal 2021 ($)	Fiscal 2022 ($)	Fiscal 2023 ($)	Fiscal 2024 ($)	
0	147,246	147,246	147,246	147,246	147,246	736,230
1	367,747	147,246	147,246	147,246	147,246	956,731
2	367,747	367,747	147,246	147,246	147,246	1,177,232
3	367,747	367,747	367,747	147,246	147,246	1,397,733
4	367,747	367,747	367,747	367,747	147,246	1,618,234
5	367,747	367,747	367,747	367,747	367,747	1,838,735

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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BC Hydro states on page 45 of the Application that "in fiscal 2018, the vast majority of customers in the Program (1,044 or 80 per cent) received no Surplus Energy Payment and of the 256 customers who received a Surplus Energy Payment, 215 or 84 per cent received a payment of less than $500."

BC Hydro also states on page 47 that it "believes that providing a transitional Energy Price for a five-year period strikes a fair balance between existing customers and other ratepayers, <u>recognizing that existing customers in the Program have incurred significant capital investments</u> and that changing the basis of the Energy Price from a long-run to a short-run value, is a significant change." [emphasis added]

Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.4 Please provide the number of customers who entered the NM program prior to April 20, 2018 and identify how many of them had Surplus Energy eligible for payout in the full year immediately preceding April 20, 2018.

1.15.4.2 Please replicate the analysis provided in response to questions 15.4 and 15.4.1 above for customers who entered the NM program prior to April 29, 2019.

RESPONSE:

As of April 29, 2019, there were 1,947 customers in the Program (595 new customers since April 20, 2018).

Most of customers who entered the Program after April 20, 2018 have not yet reached a full in-service year and therefore, their Surplus Energy Payment amounts are not yet known.

15.0 D. PRICE OF SURPLUS ENERGY

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Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.5 Please explain whether the enrolment into the NM program entails any contractual agreement between BC Hydro and the NM customer that provides assurance on i) the cost recovery of capital investments by NM customers and ii) stability of the terms and conditions, including the Energy Price, contained in RS 1289, respectively.

RESPONSE:

Enrolment in the Net Metering Program does not entail any contractual agreement between BC Hydro and the customer that provides assurance on the cost

recovery of capital investments by the customer or stability of the terms and conditions, including the Energy Price.

However, rate stability is a rate design principle. Please refer to BC Hydro's response to BCUC IR 1.9.1 where we explain how proposed transitional Energy Price aligns with the principle of rate stability.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: “BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act.”

1.15.6 Please clarify the objective of BC Hydro’s NM program, including whether cost recovery of customer’s capital investment is one of the NM program objectives.

RESPONSE:

The objectives of the Net Metering Program are outlined in section 1.1 and on page 4 of Appendix D of the Application and are re-stated below for ease of reference. These objectives are consistent with the regulatory history of the Program, including the minimum parameters set out in BCUC Letter No. L-37-03, which directed BC Hydro to prepare an application for a simple net metering tariff.

As stated on page 4 of Appendix D of the Application, the intent of the Program was to be a load offset program that:

- **Allows customers to generate their own electricity to reduce their supply from BC Hydro;**
- **Provides a safe process to connect to BC Hydro's system;**
- **Is fair to participating and non-participating customers; and**
- **Offers an accessible and streamlined process for participation.**

While cost recovery of a customer's capital investment is not an objective of the Program, BC Hydro believes that supporting the objectives of the Program requires that any proposed amendments to the Energy Price be implemented in a way that mitigates the impact to existing customers in the Program. Please refer to BC Hydro's response to BCUC IR 1.15.1 where we explain the rationale for proposing a five-year transition period.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
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Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.6 Please clarify the objective of BC Hydro's NM program, including whether cost recovery of customer's capital investment is one of the NM program objectives.

1.15.6.1 Please elaborate on the relevance of considering NM customer's capital investments in determining the appropriate transition period.

RESPONSE:

The purpose of the proposed transitional Energy Price is to provide existing customers in the Program with notice of the change to the Energy Price that mitigates the impact of the change to those customers.

As outlined in section 6.2 of the Application and section 1.3.5 of Appendix E of the Application, comments BC Hydro received through the Engagement Survey with regards to a transitional Energy Price indicated concern about the ability of existing customers to recover their initial investment. BC Hydro believes that the implementation process for the proposed update to the Energy Price should consider the concerns of existing customers and balance those concerns against the objective of fairly allocating the benefits and costs of the Program between participating and non-participating customers.

Please refer to BC Hydro's response to BCUC IR 1.15.1 where we explain the rationale for proposing a five-year transition period.

15.0 D. PRICE OF SURPLUS ENERGY

Reference: PRICE OF SURPLUS ENERGY
Exhibit B-1, pp. 44–45, 47; Appendix B, p. 2; Comprehensive Review of BC Hydro: Phase 1 Final Report, p. 4
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BC Hydro also states on page 47 that it "believes that providing a transitional Energy Price for a five-year period strikes a fair balance between existing customers and other ratepayers, <u>recognizing that existing customers in the Program have incurred significant capital investments</u> and that changing the basis of the Energy Price from a long-run to a short-run value, is a significant change." [emphasis added]

Comprehensive Review of BC Hydro: Phase 1 Final Report states on page 4: "BC Hydro stopped taking any applications under the Standing Offer Program in August 2017. The Standing Offer Program will be suspended indefinitely by BC Hydro in accordance with a regulation being issued by the government under the Clean Energy Act."

1.15.7 In consideration the SOP is suspended indefinitely, please comment on the appropriateness for BC Hydro to continue referencing the Standing Offer Program (SOP) price for purpose of the NM program until April 30, 2024.

RESPONSE:

BC Hydro does not believe that the indefinite suspension of the Standing Offer Program impacts the appropriateness of offering a transitional Energy Price.

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.

In BC Hydro's view, the need to re-evaluate and update the Energy Price does not negate the need to provide a reasonable implementation process for existing customers. Please refer to BC Hydro's response to BCUC IR 1.15.1 where we explain the rationale for proposing a five-year transition period.

16.0 E. OTHER TARIFF CHANGES

Reference: OTHER TARIFF CHANGES
Exhibit B-1, Appendix B, p. 5 of 12

BC Hydro provides the clean version of the revised tariff in Appendix B to the Application. It states on page 5 of 12 that:

3. BC Hydro will asses the proposed Generating Facility described in the Net Metering Application. Specifically:.

1.16.1 Please confirm whether the paragraph referenced above contains any typographical errors. If yes, please provide a revised version.

RESPONSE:

Yes, the revised version is:

3. BC Hydro will assess the proposed Generating Facility described in the Net Metering Application. Specifically:

17.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.2, pp. 48–49;
Virtual Net Metering

On page 49 of the Application, BC Hydro states:

While BC Hydro has received several requests to support Virtual Net Metering, including through the Engagement Survey Results, enabling customers to share credits would require significant modifications to our billing process.

In the meantime, BC Hydro has suggested that one customer "own" the net metering installation and perform the administrative task of allocating credits between the participating customers.

1.17.1 Please provide the number of requests BC Hydro has received related to Virtual Net Metering support.

RESPONSE:

In 2018 and 2019 to-date, BC Hydro received 17 email questions or comments from customers regarding BC Hydro potentially adopting Virtual Net Metering. In addition, through the Engagement Survey, BC Hydro received 25 written comments and one written submission supporting the adoption of Virtual Net Metering.

In Net Metering Evaluation Report No. 4, BC Hydro indicated that seven survey respondents had expressed an interest in Virtual Net Metering. In Net Metering Evaluation Report No. 3, discussion on Virtual Net Metering was initiated by both customers and contractors at the engagement webinar and at the contractor meeting.

17.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.2, pp. 48–49;
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On page 49 of the Application, BC Hydro states:

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In the meantime, BC Hydro has suggested that one customer “own” the net metering installation and perform the administrative task of allocating credits between the participating customers.

1.17.2 Please provide the number of known shared NM projects in BC Hydro’s service area.

RESPONSE:

BC Hydro is not currently aware of any shared Net Metering projects in BC Hydro’s service area.

18.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.3, p. 50; BC Hydro's 2017 Evaluation Report, p. 19
Broader costs and benefits of the NM program

On page 50 of the Application, BC Hydro states:

Given the installed capacity and volume of the energy generated by customer Generating Facilities in the Program at this time, the cost-shifting between participating and non-participating customers is not material. However, over time, as the Program grows, the cost-shifting could become material.

1.18.1 Please discuss and quantify how much cost-shifting is considered material.

RESPONSE:

BC Hydro clarifies that the intent of the statement referenced in the preamble was to indicate that BC Hydro will monitor the level of cost-shifting between customers in the Program and non-participating customers.

The proposed amendments in the Application are a step towards improving cost recovery from Program participants. Additional amendments to further improve cost recovery may be included in future applications. BC Hydro did not intend to suggest that there was a specific level of cost-shifting that would prompt BC Hydro to propose such amendments.

18.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.3, p. 50; BC Hydro's 2017 Evaluation Report, p. 19
Broader costs and benefits of the NM program

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Given the installed capacity and volume of the energy generated by customer Generating Facilities in the Program at this time, the cost-shifting between participating and non-participating customers is not material. However, over time, as the Program grows, the cost-shifting could become material.

1.18.2 In BC Hydro's judgment, based on the proposed tariff change, at what capacity and volume would cost-shifting become material?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.18.1 where we explain that BC Hydro did not intend to suggest that there was a specific level of cost-shifting that would prompt BC Hydro to propose amendments to further improve cost recovery from Program participants.

18.0 F. ISSUES FOR FUTURE APPLICATION

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Given the installed capacity and volume of the energy generated by customer Generating Facilities in the Program at this time, the cost-shifting between participating and non-participating customers is not material. However, over time, as the Program grows, the cost-shifting could become material.

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.

1 **https://www.nrel.gov/docs/fy16osti/65231.pdf.**

Year	Number of Additional Solar Customers (Residential Only)	Additional MW Installed	Additional Gross Solar Generation (GWh/year)[2]
2020	**430**	**3.3**	**3.6**
2021	**550**	**4.2**	**4.6**
2022	**700**	**5.2**	**5.7**
2023	**880**	**6.5**	**7.1**
2024	**1100**	**8.1**	**8.9**

[2] **Assumes that the customers' Generating Facilities are sized so that estimated Annual Energy Output is equivalent to estimated Annual Load.**

18.0 F. ISSUES FOR FUTURE APPLICATION

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Exhibit B-1, Section 7.3, p. 50; BC Hydro's 2017 Evaluation Report, p. 19
Broader costs and benefits of the NM program

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Given the installed capacity and volume of the energy generated by customer Generating Facilities in the Program at this time, the cost-shifting between participating and non-participating customers is not material. However, over time, as the Program grows, the cost-shifting could become material.

1.18.4 If the NM program is expected to grow, please comment on how demand and supply from NM customers fit into the resource plan, including how NM demand and supply affect BC Hydro's supply portfolio and system load shaping.

RESPONSE:

The installed capacity of customer Generating Facilities in the Program was 13.39 MW as of March 1, 2019. The volume of excess generation from customer Generating Facilities was approximately 3.2 GWh in fiscal 2018.

While the Program has grown in recent years, it is still relatively small. 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 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.

BC Hydro intends to review its assumptions with regards to the growth and inclusion of Net Metering in resource planning in its next Integrated Resource Plan.

If the amendments proposed in the Application to prevent Oversized Generating Facilities are approved, future growth in the Program would be expected to have a minimal impact on system supply but would have an increasing impact on customer demand.

18.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.3, p. 50; BC Hydro's 2017 Evaluation Report, p. 19
Broader costs and benefits of the NM program

On page 50 of the Application, BC Hydro states:

Given the installed capacity and volume of the energy generated by customer Generating Facilities in the Program at this time, the cost-shifting between participating and non-participating customers is not material. However, over time, as the Program grows, the cost-shifting could become material.

1.18.5 Based on the current and projected growth of the NM program, please explain when the cost-shifting would become material to BC Hydro.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.18.1 where we explain that BC Hydro did not intend to suggest that there was a specific level of cost-shifting that would prompt BC Hydro to propose amendments to further improve cost recovery from Program participants.

18.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.3, p. 50; BC Hydro's 2017 Evaluation Report, p. 19
Broader costs and benefits of the NM program

Page 50 of the Application states:

As discussed in section 8.1 of the Evaluation Report, at this time, the installed capacity and volume of energy generated by customer Generating Facilities in the Program is too small to result in any appreciable avoided cost benefits to BC Hydro and non-participating customers.

On page 19 of BC Hydro's 2017 Evaluation Report:

At this time, the installed capacity of RS 1289 generators and the volume of energy generated by those customers is simply too small to result in any appreciable avoided cost benefits to BC Hydro and other ratepayers, both in terms of the impact on
BC Hydro's LRB and avoided system costs.

1.18.6 In BC Hydro's judgment, based on the proposed tariff change, at what capacity and volume would avoided cost benefits become material?

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.18.4, BC Hydro intends to review its assumptions with regards to Net Metering in its next Integrated Resource Plan.

18.0 F. ISSUES FOR FUTURE APPLICATION

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BC Hydro's LRB and avoided system costs.

1.18.7 Based on the current and projected growth of the Program, when would the avoided cost benefits become material to BC Hydro?

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.18.4, BC Hydro intends to review its assumptions with regards to Net Metering in its next Integrated Resource Plan.

19.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.4, p. 51
Future costs and benefits of the NM program

On page 51 of the Application BC Hydro states:

In the Application, BC Hydro has proposed to update the Energy Price to reflect the value received for that energy on the regional wholesale electricity market. This proposal allows customers to sell electricity to BC Hydro at its marginal cost and is consistent with the application of Marginal Cost Pricing.

Through Phase Two of the Comprehensive Review, BC Hydro and the Government of B.C. intend to explore the potential application of Marginal Cost Pricing, including its potential application to the Program.

1.19.1 Please discuss if BC Hydro has considered alternate methods of determining BC Hydro’s marginal cost, in addition to using the market clearing price for the regional wholesale market.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.10.5 where we explain why BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods.

19.0 F. ISSUES FOR FUTURE APPLICATION

Reference: ISSUES FOR FUTURE APPLICATION
Exhibit B-1, Section 7.4, p. 51
Future costs and benefits of the NM program

On page 51 of the Application BC Hydro states:

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Through Phase Two of the Comprehensive Review, BC Hydro and the Government of B.C. intend to explore the potential application of Marginal Cost Pricing, including its potential application to the Program.

1.19.1 Please discuss if BC Hydro has considered alternate methods of determining BC Hydro’s marginal cost, in addition to using the market clearing price for the regional wholesale market.

1.19.1.1 If yes, please explain the rationale for selection of the market clearing price for the regional wholesale market.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.10.5 where we explain why BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods.

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Through Phase Two of the Comprehensive Review, BC Hydro and the Government of B.C. intend to explore the potential application of Marginal Cost Pricing, including its potential application to the Program.

1.19.1 Please discuss if BC Hydro has considered alternate methods of determining BC Hydro's marginal cost, in addition to using the market clearing price for the regional wholesale market.

1.19.1.2 If not, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.10.5 where we explain why BC Hydro recently adopted the market price as a conservative interim assumption for evaluating energy during surplus and deficit periods.

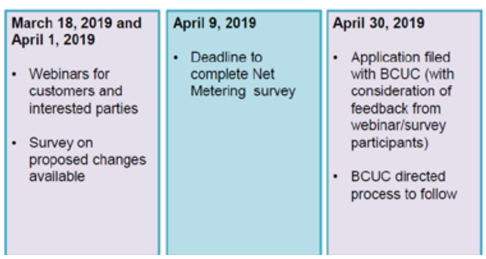
20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
Exhibit B-1, Appendix C, p. 1; Appendix D, p. 18
Review of the NM program since 2018

BC Hydro states on page 1 of its 2018 Application attached to Appendix C to the Application that:

BC Hydro is targeting to complete this review of the Program and file an application with the Commission for approval of further amendments by the end of calendar year 2018. In its review, BC Hydro will be considering other options to address the issue of oversized generating facilities. Our future application may propose maintaining the amendments requested in this Application to Amend or may propose different amendments that reflect the outcome of the review.

Page 18 of Appendix D of the Application provides the following timeline:



BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.1 Please elaborate on what analysis was done on the NM program by BC Hydro since the filing of the previous NM Application in 2018.

RESPONSE:

The Application includes the analysis completed by BC Hydro on the Program since the filing of the 2018 Amendment Application. Specifically:

- **Section 1 of the Application includes an analysis of growth and participation in the Program as well as the regulatory history of the Program.**
- **Section 2 of the Application includes an analysis of Surplus Energy Payments under the Program and potential options to address Oversized Generating Facilities.**

- **Section 3 of the Application includes an illustrative analysis of the potential benefits to customers from an optimized Anniversary Date.**
- **Section 4 of the Application includes an analysis of the value BC Hydro receives from excess generation.**
- **Appendix G contains a Jurisdictional Review of Net Metering Programs at eight utilities.**

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
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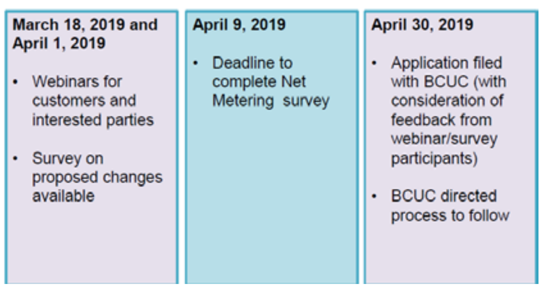

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1.20.1 Please elaborate on what analysis was done on the NM program by BC Hydro since the filing of the previous NM Application in 2018.

1.20.1.1 Please explain whether BC Hydro produced a report on its analysis. If yes, please provide a copy of the report. If not, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.20.1 where we explain that the Application includes the analysis completed by BC Hydro on the Program since the filing of the 2018 Amendment Application.

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
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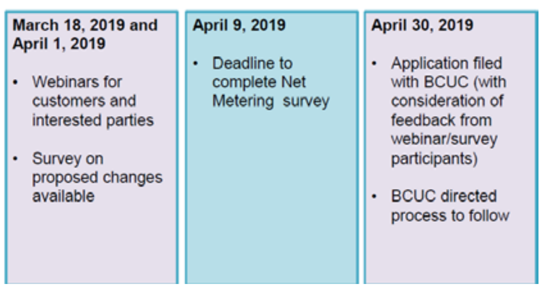

BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.2 Please explain whether BC Hydro produced an updated Net Metering Evaluation Report since the one filed in 2017. If yes, please provide a copy.

RESPONSE:

BC Hydro has not produced an updated Net Metering Evaluation Report since Report No. 4 that was filed with the BCUC on April 26, 2017.

Historically, BC Hydro has produced a Net Metering Evaluation Report in response to directives from the BCUC in its Decisions on applications by BC Hydro to amend Rate Schedule 1289. Specifically:

- **Net Metering Evaluation Report No. 1 - By Order No. G-26-04, the BCUC approved Rate Schedule 1289 and directed BC Hydro to file an evaluation report of the Program one year after the final net metering tariff was approved and to submit any proposed revisions to the net metering tariff based on its evaluation;**
- **Net Metering Evaluation Report No. 2 - By Order No. G-4-09, the BCUC approved BC Hydro's application to increase the Energy Price from 5.40 to 8.16 cents per KWh and directed BC Hydro to submit a Net Metering Evaluation Report within 120 days after the date of submission of the Standing Offer Program report associated with the review of that program;**
- **Net Metering Evaluation Report No. 3 - By Order No. G-57-12, the BCUC approved BC Hydro's application to increase the Energy Price from 8.16 to 9.99 cents per KWh and directed BC Hydro to submit a Net Metering Evaluation Report, including a report on the nameplate capacity limit for a Generating Facility; and**
- **Net Metering Evaluation Report No. 4 - By Order No. G-104-14, the BCUC approved BC Hydro's application to increase the nameplate capacity limit for a Generating Facility from 50 kW to 100 kW and directed BC Hydro to submit a progress report on Rate Schedule 1289 and the micro-Standing Offer Program.**

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

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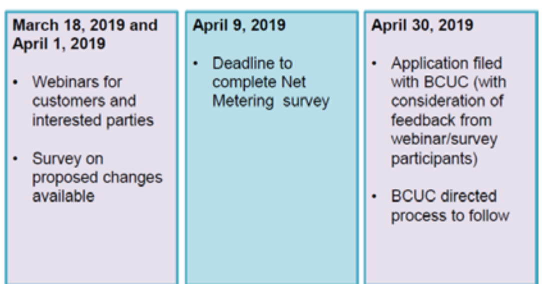

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1.20.2 Please explain whether BC Hydro produced an updated Net Metering Evaluation Report since the one filed in 2017. If yes, please provide a copy.

1.20.2.1 If no, please explain how often BC Hydro produces a Net Metering Evaluation Report, and when will BC Hydro produce its next Evaluation Report.

RESPONSE:

Please refer to BC Hydro’s response to BCUC IR 1.20.2 where we discuss how the timing of BC Hydro’s Net Metering Evaluation Reports is determined.

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
Exhibit B-1, Appendix C, p. 1; Appendix D, p. 18
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Page 18 of Appendix D of the Application provides the following timeline:

March 18, 2019 and April 1, 2019	April 9, 2019	April 30, 2019
• Webinars for customers and interested parties • Survey on proposed changes available	• Deadline to complete Net Metering survey	• Application filed with BCUC (with consideration of feedback from webinar/survey participants) • BCUC directed process to follow

BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.3 Please discuss how frequently BC Hydro conducts a review of its NM program.

RESPONSE:

BC Hydro typically undertakes reviews of the Program in response to emerging issues or opportunities or to inform a Net Metering Evaluation Report. There is no specific time period for reviews of the Program.

Please refer to BC Hydro's response to BCUC IR 1.20.2 where we discuss how the timing of BC Hydro's Net Metering Evaluation Reports is determined.

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
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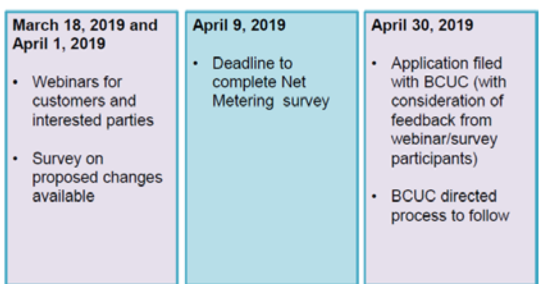

BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.4 Please explain whether all of the options contemplated by BC Hydro to address the issue of oversized generating facilities were presented to potential stakeholders in the webinars and in the Net Metering Survey.

RESPONSE:

Yes, all of the options contemplated by BC Hydro to specifically address the issue of Oversized Generating Facilities were presented to potential stakeholders in the webinars and in the Engagement Survey.

To specifically address the issue of Oversized Generating Facilities, BC Hydro considered continuing the interim solution, with a provision to allow Annual

Energy Output to exceed Annual Load by a certain percentage. Through the Engagement Survey, BC Hydro sought feedback on this proposal and asked for suggestions to provide additional flexibility to meet customer needs. After reviewing the suggestions received, BC Hydro decided to propose the additional amendments outlined in section 2.7 of the Application.

BC Hydro did consider additional options with regards to the Program more generally; however, BC Hydro decided to not to include these options within the scope of the Application and accordingly, these options were not presented during the webinars or in the Engagement Survey. Specifically, BC Hydro considered, and subsequently rejected, the following options:

1. **Status Quo;**
2. **Set an annual limit for incremental generation connected through the Program;**
3. **Discontinue the Program;**
4. **Develop a separate rate schedule for customers in the Program to receive Service from BC Hydro; and**
5. **Add a fixed / demand charge to Rate Schedule 1289**

Option 1 was rejected because BC Hydro does not believe that the Program should continue without any changes. In particular, changes are required to maintain the Program as a load offset program and to mitigate cost shifting between participating and non-participating customers.

Options 2 and 3 were rejected because BC Hydro determined that any emerging issues with the Program were best addressed through proposed amendments to Rate Schedule 1289 rather than discontinuing or limiting the availability of the Program.

Options 4 and 5 could further improve cost recovery from Program participants. These options were scoped out of the Application. Additional amendments to further improve cost recovery from Program participants may be included in future applications.

Please also refer to BC Hydro's response to BCUC IR 1.15.1 where we discuss alternatives to the proposed transitional Energy Price.

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

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Exhibit B-1, Appendix C, p. 1; Appendix D, p. 18
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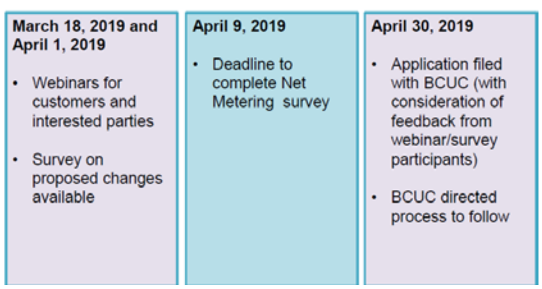

BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.4 Please explain whether all of the options contemplated by BC Hydro to address the issue of oversized generating facilities were presented to potential stakeholders in the webinars and in the Net Metering Survey.

1.20.4.1 If all options contemplated were not presented, please explain what other options were considered by BC Hydro and why those options were dismissed.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.20.4, where we confirm that all of the options contemplated by BC Hydro to specifically address the issue of

Oversized Generating Facilities were presented to potential stakeholders in the webinars and in the Engagement Survey and where we provide a list of additional options considered with regards to the Program more generally and explain why BC Hydro decided to not include these options within the scope of the Application.

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
Exhibit B-1, Appendix C, p. 1; Appendix D, p. 18
Review of the NM program since 2018

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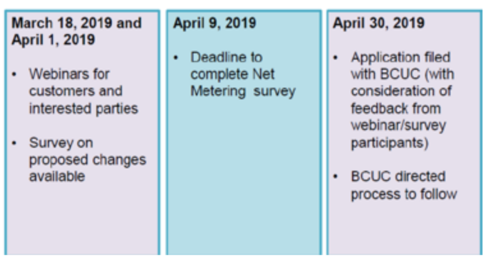

BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.5 Excluding the webinars held on March 18, 2019 and on April 1, 2019, and the Engagement Survey completed by April 9, 2019, please provide the details of all stakeholder consultation that has taken place after April 2018, following BC Hydro's Net Metering Amendment application.

RESPONSE:

The webinars held on March 18, 2019 and on April 1, 2019 and the Engagement Survey completed by April 9, 2019 represent all of the stakeholder consultation that has taken place after April 2018, following BC Hydro's Net Metering Amendment Application.

20.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: CUSTOMER AND STAKEHOLDER ENGAGEMENT
Exhibit B-1, Appendix C, p. 1; Appendix D, p. 18
Review of the NM program since 2018

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BC Hydro is targeting to complete this review of the Program and file an application with the Commission for approval of further amendments by the end of calendar year 2018. In its review, BC Hydro will be considering other options to address the issue of oversized generating facilities. Our future application may propose maintaining the amendments requested in this Application to Amend or may propose different amendments that reflect the outcome of the review.

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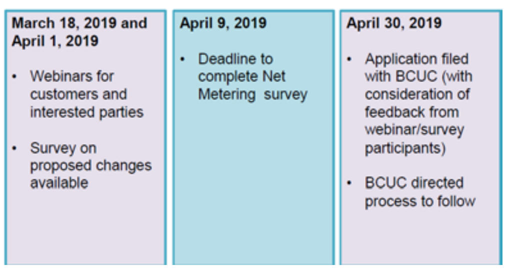

BC Hydro filed its Net Metering Evaluation Report No. 4 dated April 26, 2017 as Appendix F to the Application.

1.20.6 Please explain whether, and if so how, BC Hydro has modified its proposal contained in the Application based on the feedback from stakeholders from the webinars and Net Metering Survey.

RESPONSE:

Yes, BC Hydro has modified its proposal contained in the Application based on the feedback from stakeholders in the webinars and Engagement Survey. Specifically:

- **As stated in BC Hydro’s response to BCUC IR 1.20.4, BC Hydro asked for suggestions to provide additional flexibility with regards to the definition of Annual Load. After reviewing the suggestions received, BC Hydro decided to propose the additional amendments outlined in section 2.7 of the Application.**

- **BC Hydro had considered an extension to the true-up period; however, after considering the results of the Engagement Survey, BC Hydro chose to maintain the 12-month true-up period. Further information is provided in BC Hydro's response to BCUC IR 1.8.5.**

- **As discussed in section 3.6 of the Application, BC Hydro considered the results of the Engagement Survey, which showed support for setting a common Anniversary Date for all customers as well as allowing customers to choose their Anniversary Date. BC Hydro decided to propose a dual approach that incorporated the benefits of both options.**

- **As discussed in section 4.4 of the Application, BC Hydro proposed two options to improve fairness between participating and non-participating customers: allow customers to bank their credits for five years (credits expire after five years) and revise the price for excess energy to reflect the price at which BC Hydro could sell the electricity on the regional wholesale market. BC Hydro considered the results of the Engagement Survey, which indicated that a slight majority (53 per cent) of participants preferred updating the Energy Price, and decided to include that proposal in the Application.**

Please also refer to BC Hydro's response to BCUC IR 1.22.3 where we explain how BC Hydro considered the comments and submissions received in preparation for the Application.

21.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Customer and Stakeholder Engagement
Exhibit B-1, Appendix D, p. 2-18
Webinar materials

Page 2 of the webinar materials states that that one of the purposes of the Webinar was to “Seek your input on proposed changes to inform BC Hydro’s April30, 2019 application.”

1.21.1 Please explain how customers and stakeholders provided input during the webinar.

RESPONSE:

Webinars were held on March 18, 2019 and April 1, 2019. In both webinars, BC Hydro provided an overview of the Program, presented proposed changes to the Program, and provided participants with the opportunity to ask questions or provide comments throughout the webinar.

Customers and stakeholders had the option to submit questions or comments via an online chat function in the webinar program, or via email. Webinar participants were also encouraged to provide comments through the Engagement Survey.

21.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Customer and Stakeholder Engagement
Exhibit B-1, Appendix D, p. 2-18
Webinar materials

Page 2 of the webinar materials states that that one of the purposes of the Webinar was to "Seek your input on proposed changes to inform BC Hydro's April30, 2019 application."

1.21.2 Please provide a list of questions and comments received from the webinar participants, including BC Hydro's responses.

RESPONSE:

BC Hydro received approximately 125 questions and comments during the two webinars (approximately 80 on March 18, 2019 and 45 on April 1, 2019). BC Hydro did not capture the verbatim comments and questions received during these webinars; however, we did track key themes and common questions, which are provided below.

General Comments on the Program and Webinar

- **Overall support of the Program**
- **Appreciate the opportunity to learn more about the upcoming Application and ask questions/share ideas**
- **Webinar was interesting and informative**
- **Cost shifting between customers in the Program and non-participating customers**
- **Costs to integrate energy from the Program into BC Hydro's system**

Oversized Generating Facilities

- **How to address excessive Surplus Energy Payments being provided to existing customers in the Program**
- **Flexibility of the interim solution with regards to new builds, passive homes and electric vehicle owners**
- **The impact of increasing electric vehicle ownership on customer loads**
- **Allowing a larger Generating Facility so that customers can offset consumption during peak usage periods**

- **Concern with regards to restricting the amount of generation from the Program**
- **Concern with regards to the ability of customers to offset increased load in the future**

Anniversary Date/True-up Period

- **Clarification with regards to how changing the Anniversary Date or extending the period between Surplus Energy Payments (i.e., true-up period) would benefit customers in the Program**

Energy Price

- **Impact of updating the Energy Price on investment in the solar industry and incentives for customers to install solar generation**
- **Concerns about changing the Energy Price after indicating that BC Hydro would purchase excess generation from customers in the Program**
- **Whether an update to the Energy Price is required given the relatively small volume compared to contracts with Independent Power Producers (IPPs)**
- **Whether the Program was intended to be a load offset program or a way for customers to generate revenue**

Other Topics

- **Time-of-use rates**
- **Virtual Net Metering/Community solar**
- **Site C**

22.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Engagement Survey Results
Exhibit B-1, Appendix E, pp. 12-13

On pages 12 and 13 of Appendix E to the Application BC Hydro states it received 352 additional comments in response to the proposed changes to the Net Metering program. Further to that customers and stakeholders also provided feedback through written submissions.

1.22.1 Please provide a copy of the additional comments.

RESPONSE:

The 352 additional comments received by BC Hydro in response to Question 9 of the Engagement Survey which asked, "Are there other comments you would like to provide on the proposed changes to the Net Metering program?" are provided in Attachment 1 to this response.

The comments are provided as written and have not been edited.

1.	I paid for 40 solar panels, a top of the line heat pump, all new energy efficient windows, and an electric car in an attempt to reduce my footprint. I rely solely on electricity for heating my home. I feel it is a slap in the face for BC Hydro to now want to cut what they pay us when they are bragging how important energy conservation is and what a good job they are doing. My hydro cost in 2014 was just over $4000, last year just over $400 but it never will be zero as hydro charges other fees and surcharges. They should be encouraging everyone to install solar panels etc. by paying more not less for what we produce. Switching to LED lights and hanging clothes to dry isn't going to make that much of a difference. We all need to do more.
2.	Make the program fair.
3.	ANNIVERSARY DATE: Allow customers to pick their own anniversary date BUT BC Hydro should provide education about this to net metering users. Since the anniversary date not only effects customers but also BC Hydro and the number of payouts they need to make. Extend the lifetime of credits to five years. Keep the interim solution with greater flexibility. The people who dislike the oversized generation rules are one of three kinds of people: Those who want to use their facility for Virtual Net Metering, those who do not understand the purpose of the program, and those who want to misuse the program. Assessing facilities to match load is not an unfair ask. 10% is not a lot of oversizing to work with when taking into account how much energy an electric car (or 2) uses. Have simple guidelines in place for these kinds of requests so they do not get denied in new construction or expected increase in load applications.
4.	Roll back the paperwork on simple net metering. there isn't enough money in it for anyone to do paperwork of this scale. Who cares if they get an electric car or not? some one on their street sure is with a big ol federal rebate coming through. Even if 10% of customers put in systems that 50% cover their needs BCH is still sitting pretty. you are mandated to provide power, not make big bucks. Solar doesn't limit your ability to turn my lights on and off.

5.	**I would love to participate in the program. I was disappointed to learn about the alignment of load to consumption, particularly as it seemed to result from significant pay outs to a very small number of customers.** **I think participants should be able to generate more energy than they consume, and the excess should be made available to the market at a price premium to support ultra-local generation as well as economic development in the renewable energy sector.** **Cap the generation to load ratio at 150%. Create an application based process to increase generation in order to accommodate electric vehicles and other future demands. Always allow for more generation than load, but targeting a 150% ratio, and no payment for generation beyond 200% of load, aggregated over a three year period.**
6.	**I would like to see a model that pays people to help lower base load during the day.This way they could get paid more then what net-meter does. This way it help Hydro during the day when the big consumers are using the most power.** **I also thing that the EV cars should be able to help balance the grid.Then they could charge at night for a discounted rate and lowering demand would be very helpful.**
7.	**I would be strongly in favour of an increase in the maximum size limit for the net-metering program. With the caveat that the existing changes should be made to reflect the intent of the program as a load offset program for customers (not a mechanism to sell power to BC Hydro). The 100 kW limit is quite small for many commercial/industrial customers that I work with as a consultant, and limits the ability of such businesses to take advantage of the rapid technological changes that are taking place currently.**
8.	**Focus more on distributed solar and less on mega projects to power B.C. in the future as is the focus in areas like california**
9.	**Allow local governments and First Nations to generate more power than required to offset their own operational power consumption and sell back excess power to BC Hydro with a higher limit than the 100kW.**
10.	**Electricity prices are bound to increase over time so any net metering prices must keep track with that.** **There is considerable risk and cost in setting up a project to net meter and pay back time is very important and must not change over time. Paying a wholesale price for excess power I put on the grid and my neighbour uses and pays top dollar to BCH for is a little harsh. Now BC Hydro is making a profit on what should stay in my pocket and go to pay down my risk. Other wise, let me buy power at a wholesale price and wheel it somewhere else.**

11.	**Consolidated accounts should be produce excess amounts of electricity where it is most cost-effective. For example we proposed a Feasibility study for a (50kW to 1MW tbd) Solar PV Project at a closed landfill site with a small transfer station (20kW Load) anbd secured federal funding. BC Hydro said it doesn't fit the new net-metering program and standing offer program is closed so we got nothing. However, our organisations uses 8,500,000 kWh/year. Why does it matter where the electricity was generated if it is part of a consolidated account?**
12.	**Cancel site C.** **The whole idea behind solar power is to get off fossil fuels and unnecessary, destructive, new hydro dams. If there is excess solar energy to be had then we should be using it. We want to use all the solar energy we can get our hands on, NOT LIMIT IT.**
13.	**The net metering program does not need any changes. BC Hydro pays billions of dollars to mega IPPs and you are in a panic about $280,000 paid to small producers. BCH paid over $16 million to pulp mill IPPs for energy, they never produced. Is that OK? Ak you customers**
14.	**The questions don't reflect the consequences of the answers. It would be easier to answer if I knew what could happen if a course of action were pursued.**
15.	**Subsidize home storage batteries to the avoided cost of net metering.**
16.	**In the current global situation we should be doing everything possible to encourage the use of renewable energy - even if means making some financial sacrifices. Any changes to the Net Metering program should be made from the standpoint of encouraging customers to generate as much of their energy consumption as they possibly can. At a "non-industrial" level, if they generate more than they consume that should be considered a net gain for the community at large, and they should be encouraged to do so, not discouraged by limitations placed on the Net Metering program.**
17.	**Some of the questions were difficult to answer because neither of the options were choices I would've made. This required me to choose the lesser of options that I didn't like. Some of the plans for existing customers don't sound encouraging in light of changes that will limit the value of the investment we made in solar based on the information available three years ago. Having credits expire is very unappealing since you might as well just be taking money out of our bank account.**
18.	**Wondering why there needs to be any change except for the sole benefit of BC Hydro and not for the benefit of those on Net Metering. Again, suspicious of the motives.**

19.	**How can we be expected to comment on proposed changes to the payout system when there is absolutely NO way to tell if you intend to increase or decrease the payout amounts. This is a flawed survey and was a flawed webinar. No audio and no ability to ask questions during the webinar makes me think the whole process is a window dressing and no real consultation is actually taking place.** **If the intent is to lower the payout, then the entire program, and the solar industry in BC will collapse. Our payout is already so low, it is very difficult to sell the program to customers. We have the lowest payout of any utility in North America that I have ever seen.** **If the intent is to increase the payout, that should have been much clearer in the webinar and in this survey. Otherwise it is a flawed process and the data is skewed and useless.**
20.	**We are trying to live greener, cheaper, environmentally consciousness. Trying not to pollute the air with smoke and fossil fuels. You guys are not making this easy or encouraging clean living. Some light bulbs and energy star appliances aren't going to do it! Applauded our commitment. We are not breaking your businesses bank account with our little solar panel installs.**
21.	**Promote and create easier access to solar and renewables. The small amount of financial resouces that it takes to get BC's homes and businesses to participate compared to the number of jobs is worth the investment into the green economy.** **With the electrification of vehicles happening at an alarming rate and the advancement of lithium Ion battery technology the more solar on small Distributed Generation system the better as it will tie in with the needs of the grid eventually.** **Thanks for your time and consideration.**
22.	**Again, I strongly suggest the importance of offering a virtual net metering program ASAP. I understand the current restraints on time, and the need to address the net generation issue, but beleive that these issues are related and the solutions are likely related just the same. I'm afraid that separating the issues may create a disjointed solution. If BCH eliminated the payout to net generators but offered a pathway to donate the credits towards an energy bill at a local charity for instance, everyone would look great! Or shift the credits to another of their properties, or municipal infrastructure. Aside from the additional administration costs, which could be paid out of the program with fair fees, I beleive that this is the best possible outcome for the existing customers in the NM program, it would benefit the non-participants as well through community building, and would grow the industry in BC and add employment opportunities for youth and enhance technical trades experience, and would be a step min the right direction for consumer choice.**

	After all, it's the people that are investing their own hard earned dollars here!
23.	I was looking forward to more help from BC Hydro to encourage the installation of PV or other for residential clients in the form of incentive or more payback on over supply ,instead of turning back on your residential client that can help with produce the power you need for the future.
24.	I was unable to take part in the webinar. For the record, I propose that BC Hydro encourage diversified production by citizens. BC Hydro should move away from a monopolistic centralized approach to a diversified grid.
25.	We should receive more for the power generated to increase PV solar panel usage.
26.	work with the provincial government to convince all levels of government to drop the sales taxes on solar energy (GST).
27.	The cost of any excess energy should be refunded to the customer at the same average rate that it is charged.
28.	too many to list, thank you.
29.	I have two accounts for this property...If I have extra credits or choose to install a system for the other account, I would like the option.
30.	Program should be expanded to include large industrial customers.
31.	We need more homes putting in the PV solar at the house level, as a form of distributed generation. This then should be combined with other programs such as the BC Hydro sponsored EV charging program, where the utility can influence energy loads based on what is happening with the grid. The utility should be able to push excess electricity into loads such as EVs, smart hot water tanks, freezers, hotel swimming pools, water and sewage filtration. Yes, some of these would be limited by the what is downstream of the transformer, but there is still plenty of opportunity loads during the day when the sun is shining.
32.	This is a step in the wrong direction. You should be encouraging residential consumers to develop their own energy production, not setting barrier to limit expansion.

33.	BC Hydro should be ENCOURAGING renewable energy generation, not discouraging it. These proposed changes are a huge step backwards. In particular, community energy farms should be encouraged and promoted. We need to become more self-sufficient, not relying on huge, expensive white elephants like Site C. That should never have gone ahead.
34.	I feel frustrated that residential and other net metering power production are a very efficient and environmentally friendly way of producing power provincially (as opposed to damaging options like Site C) BCHydro should be encouraging the greatest possible uptake of this kind of distributed power production.
35.	It is hard to believe that anyone would look at BC Hydro's moves as positive for anyone other than itself, including non-participating rate payers! My project customers are absolutely fine paying someone much less than the residential rate for their power, infact they would love to buy it from them if they could. If BC Hydro wants to add sophistication be transparent. Breakup the price of power, showing the true cost of energy, transmission, distribution and retail of the power rather than declaring a 35year residential/commercial customer's small investment as inherently uncertain. BC Hydro plans for the future, why hold back a business from doing the same?
36.	One comment that I heard in the webinar is that the net metering program is subsidized by none net metering clients. I produce 40% of my electricity. I have inflow heating with an electric resistance heater. I chose this route rather than natural gas to reduce my carbon footprint. I still pay BC Hydro $1000- $1250 per year. How is that different from someone who heats with natural gas and pays less than I for Hydro? I was very thankful for the amazing work done by the hydro crews during the last big storm. I understand that net metering clients must contribute to that. Would it be possible to determine how much per year a client should pay for the repair, maintenance and infrastructure service as apposed to electricity? This may be a way to meaningfully approach the people who overproduce. Thanks for running the seminar. The net metering program is vital for the Province and our future power needs.
37.	Consider virtual net metering so more customers can participate
38.	Solar etc with net metering is much less expensive than Site S etc
39.	I believe hydro is trying to change net metering clients to terms that don’t benefit the client

40.	I would like to see publicly posted #'s for the various net metering agreements. Compared to Fortis and other jurisdictions across Canada and/or the US (Washington State etc.)
41.	I am not privy to all the details surrounding solar farms, and I am still not exactly sure what net metering means for me should I "go solar" but solar should be more encouraged for residents, (incentives) but not for profit by business or political supporters. I am a Tesla owner and should not be put in the second hydro tier as a result of owning this car.
42.	A) Considering community/neighborhood Net-Metering B) Flexibility to upgrade existing Net-Metering systems, if a customers consumption increases in the future i.e EV or Heat Pump(s)
43.	Since we have a smaller system, and basically use it to offset our hydro bills some, these proposed changes don't really apply much to us.
44.	I would like to see small households (who don't produce more energie than they need in a year), to get the same amount for the kwh they produce and give back to BC Hydro as they pay.
45.	Could you please average the consumption so second level pricing does not kick in during winter months?
46.	Pay for the power at $.1 /kwhr
47.	Net Metering should reflect the following economic values: 1. Value of renewable energy generated (paid to net metering customer) 2. Value of energy over time (time-of-use/generate) rates 3. Value of energy storage (grid value) These should all be accurately taken into account to determine the payout. These rates should be independently reviewed by the BC Utilities Commission. Net Metering participants should be able to sell their excess energy to other local customers. If a customer has demonstrated such a commitment to buy (e.g. from neighbours, community, other organizations), there should not be caps placed on generation capacity, subject to grid capacity and stability limits.
48.	Overall it's a good program however there needs to be more emphasis put on rebates to motivate people to install power generating systems. Cost/payback models vary but don't provide sufficient incentives for most people. Possibly looking at rebates tied to installs utilizing Canadian made products.

49.	Yes - I do understand that the program is net metering - but I really don't understand why BC Hydro seems to be so averse to paying for any over-generation at market rates. It's an easy way to get more energy from customers who have borne the generation costs!
50.	BC Hydro should be privatized.
51.	Need to focus on reducing GHGs through electrification so net metering should not be limited.
52.	BC Hydro has spent more on legal fees, consultation and BCUC submissions than they ever will save by reducing the net metering tariff paid to generators. And the program will be substantially reduced due to lack of interest and eventually wither away, to be replaced by high cost Site C power for now, and then in the future by????
53.	I think that it is unethical to limit a private individuals quantity of solar panels period. In this era of global warming, I believe that our society and organizations - both public and private in BC and Canada should be doing everything possible to promote the generation of "green" energy to replace the consumption of fossil fuels. It is my opinion that limiting the amount of energy I can generate to what my house consumes is unethical and totally inappropriate.
54.	We must now have sufficient data to relax the limits on how much power a residential net metering customer can install based on panel ratings. Unnecessarily limiting residential power generation because of an unnecessarily low safety factor does a disservice to the customer and BC Hydro.
55.	Please consider a virtual net-metering program that could be applied to customers that have multiple accounts including FN communities, local governments and so on. This allows for load displacement on multiple accounts, but recognizes that not all sites are suitable for generation. This could be an option for existing customers that currently over generate, but have multiple accounts.
56.	More net metering in neighbourhoods should be supported. Being able to generate and consume power within a few 100 meters is very advantageous for all parties. Quiet clean and homegrown. There should also be more support for schools to install PV systems so that kids see and learn about them in a positive way. The only item I am concerned about is that consumption of power for e-cars does not provide tax revenue for road taxes in the same way gasoline and diesel are taxed. While this is not substantial tax deficit currently, in the future the cost of electricity vs the value in transportation systems will be come more distorted and leave the highways ministries with less funds unless another equitable system of support is found.

57.	BC Hydro's changes will be a folly over the long term. No doubt small communities and strata developments will become more self-sufficient with solar as part of their community amenities and possibly bypassing the need for BC Hydro at all with battery backup. This has been demonstrated in other parts of the world.
58.	There are values to distributed generation that BC Hydro appears to be ignoring: 1) mobilizing local investment in energy production that is less environmentally harmful than production from large dams and reservoirs, 2) reducing line losses (distributed generation has typically zero line loss), 3) reducing the need for distribution line upgrades in some cases (micro-hydro, at least), 4) strengthening communities (particularly rural ones) by reducing the outflow of money to BC Hydro. BC Hydro's emphasis on the "unfairness" of some customers actually making money generating more energy than they use is a canard. These people have invested their money to generate the most environmentally benign energy possible and they should be offered a fair price for what they produce--at very least, the current wholesale price with an adder that reflects the reduction of line losses.
59.	BC Hydro customers must be able to offset their own use as electrification unfolds here in BC. Whether that is from the acquisition of EV's or switching from natural gas to heat pumps, it must be simple to upgrade a net metering installation. We want to see BC Hydro finally acknowledge that distributed generation provides real value to BC's grid and to the ratepayers of BC: - The amount of electricity/electrification required to meet our GHG reduction commitments is many Site C's. Instead of discouraging new generation such as that from NM, BC Hydro should be encouraging electrification by offering incentives for those who buy EV's (free charging stations?) and switch from fossil fuels to clean electricity; - Reduced transmission losses; - Reduced transmission upgrade costs; - Reduced generation maintenance costs (these are borne by the customer); - Reduced cost for distribution system upgrades; - Increase local generation capacity as a hedge against natural disasters e.g. Vancouver Island only generates 25% of current demand - should be more independent so if the subduction zone EQ happens and the submarine cables are damaged we can cover critical power needs; - On average, solar PV is reliable and forecastable; even wind is on a year by

	year basis; **- Seasonal distributed generation can work with BC Hydro large hydro installations synergistically to provide firm, dispatchable power year round. BC Hydro needs to consider the merits of a group of resources, not the merits of individual resources. Time to open up to these new possibilities instead of clinging to the old way.**
60.	**I would like to see more use of solar systems and the creation of micro grids. The day will come when we can not rely in the over land transmission systems ,because of the increased storms and other extreme weather patterns we will be facing with climate change**
61.	**Payment price to customers for excess generation should be equal to what BC Hydro charges the customer NOT a price based on the regional wholesale market.**
62.	**I wish there was greater clarity and on-line access to generation records to allow for performance benchmarks over time.**
63.	**The amount of money spent reviewing the net metering program is embarrassing compared to the dollars spent on "excess" generation. This excess generation is consumed by neighbours on the same feeder at residential rates and did not require any system upgrades or transmission related costs, it cannot be treated like wholesale generation. This penny pinching will reflect poorly on BCH, BCUC and the NDP government as some large scale IPPs generate more "excess" power in a few hours, and at similar or higher rate. Net metering customers installed private equipment with no subsidies and no hope of a quick payoff, they did it because they wanted to be leaders in renewable energy.**
64.	**It may be time to address standby charges for net metering**
65.	**This program is rather disappointing. I first saw it as a great driver for investment in solar PV at the household level, but in reality it was either abused or hamstrung by BC Hydro.** **This program SHOULD be one that encourages Residential and Business customers to oversize their arrays (within reason, maybe 40%?) in order to have a small revenue stream for them while utilizing underused rooftop spaces and encouraging adoption of alternative energy generation.** **It was never just supposed to be an offset program. People need these programs to overcome the ridiculous costs for engineering and permitting to install alternative energy generation in BC.**
66.	**The price paid for excess energy should include a feed on tariff to incentivize generation. And to recognize BCHydros deferred generation expansion capacity. Not wholesale costs.**

67.	This survey reflect what BC Hydro wants, not what may be best for the province long term! Very poor survey.
68.	BC Hydro should not oppose anyone wanting to produce clean renuable energy where it is being consumed. They should encourage with subsidies people that want to help pay for and donate their land or buildings to this energy source that doesn’t flood land or create any negative impact.
69.	Credit net metering customers a rate that compensated them for maintenance and transmission loss, or at least pay them the rate additional infrastructure will be costing you (site c costs).
70.	BC Hydro should relax and be 100% committed to green energy from the public sector and get there head out of the sand and follow suite to what goes on in the rest of the world. I can’t believe they whine about a few hundredth thousand dollars they have to pay out over a 12 month period while they rake in millions from the customers At this day and age shelve the bureaucratic BS and do what’s good for our planet just my 2 cents
71.	It seems odd that small PV systems are being discouraged from producing excess electricity when BCHydro is developing its most expensive project because of forecast electricity demand.
72.	There were a few mechanisms discussed during the webinar that are worth considering... - Set a base threshold for requiring a load analysis (ie 6KW of AC) for residential systems - Set a maximum size for residential NM systems (30KW?) - Indexing the rate paid for excess energy production to the Tier-1 local retail rate rather than having a fixed rate of 9.99 cents that outdates itself or requires review. Would ensure consistent economics for both customers & BC Hydro. - Incentives for integration of battery systems that can provide grid support functions during off-peak load hours. Battery systems can be sized according to off-grid system design, and provide for local energy storage that BC Hydro could take advantage of. Imagine a mega dam distributed across metro Vancouver that BC Hydro didn't have to build, maintain, expropriate land for, etc.

73.	BC Hydro's survey is very one sided and single purpose to only ask questions in favour of BC Hydro's interests. Net metering was intended to provide the opportunity to sell excess power to BC Hydro to offset the cost of PV power generation and therefore encourage its deployment. BC Hydro is now trying to avoid the primary purpose of net metering by making up scenarios to support over turning the program. Hopefully BCUC sees through this deception.
74.	Any efforts to generate renewable energy should be embraced. No restrictions.
75.	Stop discouraging people from generating renewable energy in any amount. No limits on residential systems! Heard of global climate change?
76.	Dealing with solar, a longer true up period and permitting some oversizing would help average out the vagaries of weather and changes in lifestyle. eg buying ev's and switching from gas to electric heat.
77.	BC Hydro can be a leader in moving us away from energy generation that causes impacts on the local ecosystems and consequently on the economy supported by those ecosystems.
78.	BCH should offer financing for battery storage technology as an alternative to net metering.
79.	Make it solar installation friendly, not solar installation inhibiting.
80.	BC Hydro should assume that most, if not all net metering customers will own and be recharging electric cars within the next 3 to 5 years.
81.	Do the Net Metering Program make money for BC Hydro?
82.	See previous comment. Also, BC Hydro needs to overhaul its rate structure to better reflect reality and also encourage energy conservation. Currently, the very low rates offered to industrial, commercial, governmental customers does not encourage conservation and most certainly does not encourage these customers to install solar pv, which could be a huge boon to BCHydro in the long run. The extremely ill-considered Site C dam, in addition to ruining a beautiful valley and putting local residents at risk, is also unnecessary (not to mention hugely expensive) given the potential distributed energy available to BCHydro through the encouragement of solar PV. BC Hydro with its enviable position as a crown corporation and essentially the only hydro utility in BC should use its position to become a leader in energy conservation and the use of distributed solar energy.

83.	I have invested $18,000 in PV panels, a cost that I expect will amortise over 20 years. B.C. Hydro should increase the rate for the power I feed back into the grid so that the pay-off for my investments is a shorter period of time. This would also be an incentive for more households to invest in alternate energy generation. I plan to buy an electric car in the next few years and should not be restricted to my present generation level.
84.	We appreciate being able to take part in the net-metering program.
85.	Allow customers to get to net zero
86.	Yes - expand it with incentives. Also DSM. They are far cheaper than the stupid SITE C ATROCITY!! STOP SITE C NOW!!!
87.	Any changes that slow the installation of alternate energy production (from a non-polluting source) is contrary to the best interest of BC Hydro and it's customers over time. Efforts by some to curtail or minimize net metering, are a sign of quarterly or medieval thinking during a time when vision for the future is required for corporate success.
88.	We are offsetting consumption by investing in solar panels. We should be getting paid the higher rate for doing so. It is sad that BC Hydro has become a political tool.
89.	Any changes to Net Metering should have the end result of expanding the program and supporting small producers of environmentally friendly sources of energy -- this is the future of energy in BC, similar to what is seen in many other countries. Net Metering is part of future solutions to growing energy needs and BC Hydro, funded by taxpayers and customers, must welcome new sources of energy produced in environmentally-friendly projects.
90.	Pay higher $amounts just as BC Hydro was so generous to private hydro investors !!
91.	I strongly feel that we should be allowed to produce more power than we use simply because it makes sense and ultimately should help BC Hydro scale up for the "electrified future". I doubt I would ever produce more than I use or at least not much more, but for those who have the ability to do so, why not let them? Thanks

92.	**BC Hydro should factor in the province's CleanBC program as this may increase opportunities for net metering. Basing net metering on today's conditions may be overly restrictive in future.** **As with any program, flexibility is needed to adapt to changes in the system requirements as well as recognize the investment made by the net metering applicant.** **BC Hydro also has the choice on whether they want to have a Net Metering Program that is successful or not. Simply having a program that exists but does not function because of a designed in barrier(s) including pricing only serves the needs of the program staff and not the public or the customers. Selection of a "regional wholesale market" for pricing (Mid C??) is not representative of requirements for long term investments in electricity generation. Most net metering installations are long term investments.**
93.	**This a good program and should continue on the basis that it is a "Net zero" program. Excess generation should be a different program.**
94.	**it does concern me that when i buy an electric vehicle, within the next few years, or as i age and require more electric heating, or as the cost of hydro rises, that i will not be able to increase my solar system to accommodate the demand. Also, it seems to me there needs to be a distinction between customers producing barely enough to cover load and those customers that are producing a vast amount of power, almost as if a commercial production. but i don't have any suggestions on how to level the playing field.**
95.	**Do not do anything!!!!!!!!!!!!!!!!!!!!** **Keep it the same, so we can get up over our net usage.** **At the very least make the excess power allowed go up to 25% and, pay us what you charge us, not what you would get on the wholesale market.!!!!!!!!!!!!!!!!!**
96.	**We need more sustainable energy and a more decentralized power grid for sustainability and security. I'm not sure if this is in BC Hydro's interests but our species is facing a number of existential threats and at some point we need to start doing things that work for the world and not just in the context of what works for the business. Ideally we find a way to have our cake and eat it too.**
97.	**Your proposed changes would not be necessary if BC Hydro was not locked in to contracts with independent power producers such as the run-of-the-river projects. In my opinion, Site C dam is not really necessary and this is also a factor in discouraging customers from generating electricity in excess of their demand.**

98.	I am glad that BC Hydro is supporting the idea of people using alternate means of consuming energy like solar and wind to off set at least some of the costs of their electricity, it seems that BC Hydro went into this venture without really working out all the parameters and problems that can arise. I think they didn't quite expect there to be that much enthusiasm on the part of consumers - some who I gather were over-enthusiastic and perhaps a bit greedy too, expecting that if they produced more energy than they consumed, BC Hydro would pay them for the excess energy! Hydro should have expected this. Of course Hydro can't pay out more than they make from selling electricity. They aren't a charity! Several times during the webinar a representative suggested that there needed to be fairness to those customers who are not using alternate methods such as solar and wind energy. This seemed to imply that those of us who, at significant personal expense, chose to install solar panels or other means of generating some of our own electricity are not being fair to those customers who did not. And yet ALL customers pay the same rates per kWh. So how are those of us who have paid thousands of dollars out of our own pockets gaining an unfair advantage when we are able to offset a portion of our electricity costs by allowing Hydro to have our unused energy? Hydro has made it abundantly clear that they will only accept a portion of the energy we produce to offset our bills. If over a year we were to produce more of our own energy than we consume from Hydro we will not be reimbursed for that extra energy which goes to Hydro. At least that is how I understand it to work. Yes we chose to go solar to attempt to reduce a portion of our electricity bills but we also chose to go solar because it is the green thing to do. It will be interesting to see what Hydro is going to do next. I would like to see a great deal more solar generation at individual residences and businesses. There are a LOT of empty rooftops of big buildings where solar panels could be installed. If there was more solar generation would this not free up Hydro to sell off more hydro generated power? Would this not be economically beneficial to BC Hydro?
99.	give resiliency of the system equal weighting to cost of electricity
100.	BC Hydro should be paying their avoided cost for Site C for all independent power generation.
101.	I think it's a terrible mistake that BC Hydro has chosen to dis-allow generation of more energy than consumed. We need now, more than ever, to support any effort on the part of individuals and communities to generate clean, sustainable energy. With rooftop PV, no other real estate is necessary for power generation-- a great bonus. I urge you to reconsider. Thank you.
102.	I don't think there should be a limit on production of residential solar PVs. One should be encouraged ! I also own an electric car, which is mostly powered by my PVs. Had a surplus for the last 4 1/2 years and never had a raise -- considering the consumer rates went up every year !!
103.	Make it sustainable and flexible to allow uptake

104.	Being fair to people who are willing to put their money to help create power, and paying them fairly should be a no-brainer. BC Hydro is supposed to be a publicly owned company - i.e. owned by the public. If individuals , as part of that same public, can generate energy, why should this be such a problem?
105.	Do not underestimate the impact of electric vehicles on potential demand for the Net Metering program. I have read surveys that suggest that once a consumer buys an electric vehicle they are 10 times more likely to install a PV generation system. My original idea for installing a PV generation system was to offset the increased electricity demand I would have from having two electric vehicles in my household. When I did some research I realized that I had a good solar resource and that I could install a system that would cover my electric vehicle demand plus almost cover my annual household demand. It might sound crazy, but I thought that if I installed this larger system it would allow BC Hydro to export "my electricity" to an area (like Washington state) that still has coal fired generation. Again, might sound crazy, but I thought that in some small way I might be helping to reduce CO2 emissions from coal fired generation by installing a larger system.
106.	Climate change is here. We need to get off fossil fuels, and unless you are planning to build 4 more site C's in the next 20 years, we will need a lot more renewable energy. Local generation and storage can provide the additional renewable energy to bring this province out of the dark ages. Net metering is easy and already being done in many jurisdictions. You should be embarrassed that Alberta is being way more progressive in regards to local solar generation than BC. I know that I am.
107.	Why aren’t people allowed to sell excess power to grid
108.	All existing systems should be grandfathered for all time. The net metering program should be opened up so that all existing and potential generators can safely generate as much power as they can and excess power should be sold to BC customers at the 1289 rate and then other wholesale customers. This program should be setup as a partnership between BC Hydro and the generators. Serious generators should be given an opportunity to become small commercial power suppliers to BC Hydro. I would be pleased to sit on a committee.
109.	Thanks for the input. For some reason I was not able to view the slide presentation online during the webinar but did hear the presentation and view the slides thanks to the link provided today

110.	The net metering program is already a well thought out solution to addressing climate change concerns. It will assist in the electrification of transport. Moving the payout date to March is a good idea.
111.	Satisfied with net metering as originally intended ‘not interested in being a supplier
112.	Why is Hydro not on board to encourage PV solar to be installed on any or all rooftops where solar generation is feasible?
113.	This survey is bias as it does not allow people to answer in opposition to any changes.
114.	I'm not 100% sure of the implications to these answers. In general I am concerned that BC Hydro may be backing away from the idea of a robust and attractive net metering program, perhaps due to, soon to be available capacity increases from Site C. Any reduction in attaractiveness of the program will be ignoring the concept of reduction in usage allowing BC Hydro to sell more power to reduce coal fired generation thereby helping achieve all important environmental benefits. In other words, personal solar generation helps reduce usage which in turn reduces environmental the worlds impact on the environment.
115.	If 5 customers are getting a payout of $244000, why doesn't BC Hydro focus on those producers, and treat them like IPP's? The 1800 or so other producers are getting collectively $80,000 in payouts, that's about $44 per year per producer, hardly something to get excited about, most people's GST credit amounts to more. Why are we all being scrutinized, and facing consequences for the faults of a few.
116.	It’s too bad it’s so political. These programs should be embraced as they could be so positive for everyone.
117.	BC Hydro sells power to companies for for lower rates that residential consumers pay. So selling excess power on the wholesale market is arbitrary and unfair and easily manipulated. should be sold for what BC Hydro sells to residential customers.
118.	Net Metering is a desirable program to encourage residential installation and offsetting of electrical usage. Participation in this program requires self education and awareness which results in reduced electrical consumption.
119.	BC Hydro should consider allowing over capacity ability for home residential to become net zero energy in total energy, not just net zero in electricity. For example we use electricity and gas in our home. There is no way we would be able to make our home, or any others planning to build homes using two fuel sources to be net zero unless then can generate electricity to offset their total

	energy consumption. My suggestion is that the least that BC Hydro can do is allow overcapacity up to net zero for residential. Anything above that I can reluctantly support the BC Hydro position that it should not be allowed.
120.	Maintain the net metering program and create other incentives for renewable energy.
121.	Work with Municipalities to support rooftop Trackers for more efficient collection of solar energy. With our models 3 feet above roof flat surface is normal. But with Tripod type this can be 10 feet off a flat garage or house roof. Commercial faces the same when roofs are flat.
122.	General comments were stated on previous screens. Utilize smart meters to encourage better time of use/supply with a distributed renewable system.
123.	BCians should be allowed to produce power. On-site production is the most efficient and sustainable way to produce electricity.
124.	Net Metering should be encouraged and expanded to allow for the growth of renewable energy in BC and the increased resilience of homes and communities.
125.	our goal in our low rise construction projects is to lower our demand by 75% of a conventional code compliant building today and then offset 75% to 85% of our power requirements on an annual basis with solar PV generation solely on the roof of the building. we are almost acheiving this goal in our current projects.
126.	I understand the reasons for 'reining in' existing and future net metering customers that wish to generate electricity in excess of their consumption, presumably as a source of income. That is not the intent of this program. At the same time, residents should be encouraged to become at least partially energy self-sufficient. I have learned so much about my electricity consumption by monitoring my own generation; everyone could benefit from this experience. Therefore, I'm surprised there are no provincial or federal rebate/ grant programs for solar voltaic systems. The Regional District of Nanaimo offered a $200 rebate when I installed my system; not much in the grand scheme, but enough to tip the scales in favor of installation and make me feel 'rewarded' for doing a good thing. Furthermore, my solar voltaic system not only offsets my intake from the grid; it also, in a very small way, may reduce demand on the grid. Cumulatively, many small measures like this might add up to offset or delay the need for yet another Site C dam.

127.	The proposed changes weaken the net metering program, which makes our power system more resilient and reliable, especially as climate change continues to impact our grid, which is susceptible to extreme weather events. The opposite direction should be taken to provide adequate incentives for increased take up.
128.	What about some rebates for installing PV panels, there are currently no rebates available for domestic consumers and it is very costly to install with a long Return on Investment rate. Customers that are going with your program truly care about the environment and is causing less strain on the energy system during so they should be rewarded for this.
129.	The future of decentralized power generation is coming on us very quickly. Please plan accordingly, and re-consider whether BC really needs energy mega-projects such as Site C. Will Site C be able to compete with my rooftop?
130.	The proposed changes are contrary to the initiative about Clean BC and seems to not make any sense at all. It comes down to dollars and cents from how it was explained to us; however if that is the case, we should have the same advantage and at least have the payouts happening until our initial investments are paid for. With respect to power production: the need is every year increasing and that is also reflected in huge hydro projects like the Site C Dam. We don't even know right now, how much this project will cost the tax payers. It for is however certain already, that the production through this dam will be much more expensive, than what any of us are being paid for the excessive power.
131.	Whatever changes are made, would like the program to *encourage* installation of distributed generation rather than discourage it.
132.	Leave it completely the way it is, its a cash grab and hinders people going solar
133.	I want EQUITY for small time producers/consumers of their own power. If it is substantially different from the 130 large IPPs I am opposed to any fine tuning or changes. If it is good for Plutonic, it should be good for Joe Average (and Josephine)
134.	as i stated allow customers to produce as much as they want. I do plan to get another electric car. I sold mine last year
135.	WE don't want to be penalized for generating more electricity than we consume. There is a limit to what is feasible for us to generate because of the size of our roof. BC Hydro should not be concerned about the chances of our generation exceeding our consumption. What is of concern is the exorbitant rates being paid to those who are generating electricity primarily to sell it to BC Hydro at inflated rates.

136.	Hydro is clearly not taking climate change seriously. Solar is the most powerful energy source on this planet, by a factor of 10,000. Get with it!!
137.	The addition of an Electric car is not my only concern for the 10% additional surplus over the general expected household amount generated. I expect to retire in the next 5 years. With that change in age and activity I could expect to be less resistant to heat and cold and could easily exceed the allotment of 10% consumption just in the act of staying home (from work). It is also a reality with an aging population that enjoys a longer lifespan and the prospect of climate change that the math could use an adjustment above 10%. It may be wise to factor in the electrical demands our region will have with the shift in population due to; climate change, economic concerns and global migration.
138.	See the grand fathering comments. Some utilities in the US and elsewhere have worked with and adapted to distrubuted energy, roof top PV, included. Others are attempting to prevent adoption or expansion of grid tied pv. With the falling price of energy storsge systems, those utilities and their ratepayers will be the losers. Which will we be?
139.	1. Load/generation ratios values tend to fluctuate each year. Estimating load for a new residence is not precise or reliable. I suggest that the preliminary estimates of load and generation be used for the first year, with no penalties for estimate to actual differences. Then, with the first year's data on load and generation, set allowable generation at least 10% above load. In the past 5 years, our annual PV generation has been fairly uniform but with +5.26% one year and -3.17% the past 2 smokey years in Vernon. So, a load/generation ratio within 0.90 and 1.10 should be allowed without penalty. 2. BC Hydro could make the net metering billing process simpler and fairer for small generators and non-generating customers. Bill all customers for the daily basic charge, regardless of any kWh credits. We have a grid connected PV system. Thus, we should pay the basic charge, which is an infrastructure charge, for infrastructure we use. Then, BC Hydro and small generators are simply trading kWh, with no special deals compared to non-producing customers. 3. Payment for my over production at some whole sale rate seems like I am being diddled by BC Hydro. There must be some independent rate setting agent to be fair to BC Hydro and small generators. 4. I completely support allowing small generators to select their true-up date,

	and that may be any day of the year. Your computers do not know it is Christmas day! I want our true-up date on 25 March. If I have payed the basic infrastructure charges bi-monthly, then there would be a dollar credit towards future basic charges or I will pay for the power used beyond my kWh credits for the year. SIMPLE. **5. Virtual Net Metering will be good for me. Now, I move a dollar credit from my main meter account (connected to my PV system) to the suite meter account. Thus, I lose. I would not lose if I could transfer kWh from our main account to our suite account, both in the same house.** **6. The $0.0999 rate for excess generation was an attractant to installing our PV system. We installed all the PV modules that we could on our south facing roof because we have an all electric house. In fact, we never did calculate an estimated load. Nonetheless, this rate became important to us as the base electrical rate was 6.2 cents/kWh in 2013. Now, it is 8.8 cents/kWh. Thus, we now pay for electricity when we did not before.** **If we can select or true-up date, changing from 25 November which strongly favours BC Hydro financially, to 25 March which would allow us to use our kWh credits and not dollar credits (a loosing arrangement for us), then the dollar cost for electricity to or from us will be small. Thus, I am not excessively concerned with the rate payable by BC Hydro for our excess generation. Nonetheless, I feel ripped off at 3-4 cents/kWh.** **7. The 9.99 cents/kWh was a modest incentive to pay for the installation of a grid connected PV system, but not likely a deciding factor for residential systems. OK, BC Hydro is not in the business of promoting residential PV systems.** **The Government of BC, which owns BC Hydro, is talking greenhouse gas reduction. Perhaps, the government could do some walking that aligns with their talk. A grant of $5,000 to home owners who install a PV system and install a heat pump sounds encouraging, albeit too late for us.**
140.	**I would like to recieve a fair market price for excess power I generate. And I'd like to see Site C stop as it is more costly than promoting solar and other alternstives.. and causes huge environmental impacts. I will be purchasing an electric car within the year.**
141.	**What incentives will you out in place for residential solar installations? How will you encourage additional participants in net metering? Residential pv is such a small part of utility energy generation, how can we make it much bigger?**
142.	**Did I read a fews things wrong? Why would BC Hydro want to STOP people from generating more power? If the grid can support that kind of power coming into a home, why can't it support that kind of power coming out of a home? Does BC Hydro operate in a different province? The cost of maintaining and**

	building hydro lines must be really, really small for BC Hydro to want to limit localized power generation? The link I followed should have read: How to apply for a $20 to $50 thousand dollar grant from BC Hydro to make your home generate itself - no BS!
143.	Thank you!!!!
144.	Keep the old program...maybe some minor tweeks
145.	See my reply to the previous page's question. I would add that my PV system was oversized to compensate for the constant decrease in the efficiency of PV cells over time as well as the inevitable change in the near future to electric vehicle charging. My household consumption has also dropped considerably thanks to the change to LED lighting and replacing appliances with Energy Star appliances as necessary. As far as the "Fairness" to all customers, I am still paying the basic delivery charges and 5% rate rider on what I am charged by BCH, so I am confused why it is unfair to other customers that I have Net Metering. I have paid out the cost of my PV system and should be benefiting from that investment at a fair rate to BCH and myself.
146.	I strongly believe limiting green energy production is very, very wrong. BC Hydro should be encouraging people to install excess production, not trying to limit it. I cannot think of a single reason why BC Hydro would do this except to avoid having Site C made redundant.
147.	The time is now to take as many climate actions as possible. We all must look at ways to be energy efficient and be using a combination of flexible methods to reduce greenhouse gas emissions. BC Hydro must be a leader and an example of encouraging residents to move towards on grid electricity, offset by solar and the use of EV chargers.
148.	If BC Hydro removed the restrictive load-to-generation ratio threshold, and allowed BC residents to generate excess electricity for the grid, funds and resources wouldn't be necessary for mega-projects like Site C Dam. Problems related to indigenous land rights violations, flooding of agricultural land, and other environmentally harmful effects of such mega-projects could also be avoided.
149.	The programme should encourage a win win situation for all parties. Over time everyone should be able to realize the cost savings afforded through distributed energy generation; the re-payment of the expenses incurred; and the required ongoing life-cycle maintenance and updates. The Power Corps must be able to generate sufficient income to continue to provide the necessary grid backup

	and all that entails. Over time the present energy provision structures will change. Flexibility of mind and process will be needed to maintain a pleasant working energy environment. AJ
150.	Let home owners generate up to 20% more then they consume.
151.	I think that net metering should be strongly encouraged and incentives given to people like myself to install renewable energy systems.
152.	encourage more for renewable energy whatever they are residential or commercial.
153.	One proposal was to pay at regional market rates (presumable Mid-C, since that is how the large industrial customer freshet rate is based). Recent Mid-C day-ahead prices reached 900 USD/MWh, and prices last summer pushed 100 USD/MWh - would you actually be willing to pay up to that price? To be fair, the payment ought to be base on a pro-rata delivery basis, i.e. if the majority of the surplus were generated in June and July, then the June and July prices should be used.
154.	The way BC Hydro seems to be moving may be perceived as detrimental to Vancouver's desire to become net-zero regarding energy produced within the city limits. Our company has been, for the past few years, developing a generator to assist Vancouver in it's desire to become net-zero regarding energy that is consumed within it's city limits. We are interested in how BC Hydro would view a steady 25 KW/H generator 24 hours/day 365 days/year being used to help Vancouver achieve their goal. At present, your restrictions would make it impossible for someone to help Vancouver city to become a net/zero energy consumer
155.	Encourage local elec generation & use large hydro & local storage to reduce regional ghg emissions from elec generation.
156.	We need to support cooperative consumer-end green-power generation at every opportunity.
157.	I'm happy with the program. In my initial year, I had excess generation of 1500 kWh, but was able to consume it turning on my heat pump (even though it's far cheaper to heat a home with natural gas). In this case on my anniversary date I ended up with a negative balance on my bill that I was able to consume during the next heating season. I appreciated this option. We purchased an electric vehicle two years ago come May 30th, and the excess generation is no longer an issue. In fact, I have about a 1200 kWh shortfall because we're driving the EV every chance we get (i.e. we're driving it far more than the vehicle it replaced).

	There is also the potential that I double my solar installation to allow me to heat my home using my heat pump which I currently only use for air conditioning. There's also the potential for a second EV. As noted earlier, being able to generate excess at one address and being able to apply it to another address that cannot accommodate solar generation would be an attractive benefit. Again, if the excess was not used, I would not question having it paid out at the wholesale price. Thank you for the program and your continued efforts to improve it.
158.	Forcing independents to forego the long term planning that Hydro supposedly follows is stupid and self serving.
159.	BC Hydro should not be regulating Clean Power because BC Hydro has caused much of the problems that are contrary to Clean Power
160.	I feel that the changes are unnecessary, and will have a considerable chilling effect on the development of alternative home based or community generation. The numbers of people 'abusing' the system are small, and rule changes should be possible that target them rather than applying a blanket solution.
161.	I don't see any changes that would make it easier for townhouse and condomium owners to participate in this program - to add solar panels on all appropriate roofs and share the output among all owners, whether their roofs are facing the right directions or not. Please work out a way to do this - more and more homeowners are not in single-family detached houses, so this is more and more important. Thanks
162.	If you want to encourage responsible environmental attitudes, there needs to be some incentive. I have no problem with limiting over generation. I realize that it may appear that you are exporting power a way cheaper than you sell power to British Columbians, but a certain amount of over-capacity is required to maintain required deliverables. The same should apply to us smaller generators. I have no problem with reducing the payout on excess generated power on the yearly level-up. My concern is that this does not affect the daily or monthly overs. I hope it is just a credit system, one for one until the level-up at the end of the year. There is also the issue of prime time price of power. If you want to encourage prime time power generation (other than solar) where is the incentive?
163.	Home energy generation and net metering add resilience to the grid and to customers' energy resources and home security.

	Excess generation is generally consumed by the next customers on the feeder. Price at which excess generation is credited should absolutely reflect the price the NM customer and their neighbors pay for electricity.
164.	**Make BC and British Columbians resilient by letting them meet their own energy needs either by producing what they need or reducing what they consume (i.e. DSM).**
165.	**I think this is ridiculous and just another way for BC Hydro to try to screw the consumer. If we generate our own energy you should let us use it and not penalize consumers for being green. Dirty energy companies need to be curbed. Reward people who are trying to do the right thing for our planet!**
166.	**policy should encourage net metering especially for car charging, but should not force Hydro to buy power they don't need like run of the river.**
167.	**Most generated electricity is sold to the US anyway, so why is anyone limited as to how much power can be sold back to the grid?**
168.	**I think it is absurdly wrong-headednot to encourage as much carbon-neutral power generation as possible. After all, if people are willing to invest their own capital in these technologies, it benefits everyone. I can see the power-generation utility viewpoint that seeks to protect their inbvestment in large-scal generation, namely that if demand falls for centrally-generated power, then there will be less of a demand for the production from these facilities and hence a loss of revenue. To offset this, utilities commissions must be prepared to backstopthese long-term investments. My opinion is that such financial and environmental boondoggles such as the site C dam could be completely avoided by using the existing grid to support small-scale power production. That horse has left the barn, but we can still speculate as to what advances could have been made with those billions of taxpayers dollars . . .**
169.	**My biggest complaint is the true up date . I think March 1 or 15 would be the best** **All in all leave things the way they are**
170.	**Why is BC Hydro not encouraging more distributed power systems such as solar and wind to improve the overall security of the grid rather than centralizing and discouraging? Even paying at the retail rate of .09/kWh is ridiculous for persons who have decided to make a financial commitment to an environmental choice, i.e. harvesting their own electricity and reducing reliance on the grid. Instead BC Hydro chooses to support Site C which is going to be billions of dollars overbudget, will destroy thousands of acres of fertile farmland and cost far more than other solutions that technology has made available and will improve in the future.**

171.	I understand that BC Hydro has the responsibilty to repair, install, and maintain the grid. That being said, I think it would be fair to pay people a wholesale price after the one year anniversary period if they produced excess electricity over that time period. I would be opposed to adopting a net billing system, like the one in place in Alberta where on any given day, if one overproduces electricity, they are payed a wholesale price, then when they need electricity from the grid at night, they pay the retail price.
172.	Please don't take away the or reduce incentive for people to go with Solar or alternate energy producing systems
173.	BC Hydro, should be promoting energy self reliance and actively support localized community renewable energy production in order to diversify the electricity grid. Community based distributed energy production makes the grid more resilient and allows customers to participate directly in supporting the production of clean renewable energy production.
174.	I firmly believe it's time to rethink almost all our economic theory. We are no longer in "business as usual" times. I do not support Site C dam construction, for example. This huge project is being constructed in a time of intensifying climate change to provide electricity as a commodity for - let's face it, we all know - the LNG industry and other fossil fuel and mining/extractive industries. Lost in the discussion is the destruction of prime farmland which will be needed for food security as the climate changes. And there is the always unaddressed question of First Nations feedback and justice. BC Hydro's working framework is really 19th century thinking when 21st century vision and solutions are required. BC could and should be a model of renewable energy infrastructure and options. Why can't BC Hydro design workable net metering options for community solar installations? I haven't heard any answer to this.
175.	I would like to see the net metering program offer incentives for people to transition to solar panels and would be pleased with any and all effort that BC Hydro could make in fostering this transition.
176.	The Net Metering program should be expanded and not limited in any way if we are serious about doing all that we can to reduce global warming and climate change. I would not like to think that BC Hydro is limiting this Net Metering program as a result of over spending on mistaken projects such as the Site C dam. In my opinion, the Site C Dam project should be stopped as soon as possible and the infrastructure that is in place should be redirected and recommissioned to be used to somehow generate wind/solar or alternative power.

177.	Support Community Projects like Utility Companies such as Rocky Mountain Power in Utah: Blue Sky Community Project Funds https://www.rockymountainpower.net/env/bsre/bscpf.html An opportunity to promote additional renewable energy development For more than 15 years, Rocky Mountain Power's Blue Sky customers have made a difference by supporting renewable energy in the western region. Since 2006, Blue Sky customers have also helped fund more than 120 new community-based renewable energy projects in Rocky Mountain Power communities throughout Utah, Wyoming and Idaho. Many of these projects are now complete, generating electricity and providing educational opportunities. See a listing of past Blue Sky funded projects » Funding Available! Blue Sky funding applications are now being accepted! Blue Sky community project funding comes from customers participating in the Blue Sky program and is available to help cover the capital costs of installing new renewable energy systems for non-residential, community-serving sites within the Rocky Mountain Power service area. Projects will be reviewed as they are received and selected through a comprehensive evaluation process.
178.	I think you should be supporting GREEN energy production, not building dams for fossil fuel based foreign corporations. Think about your grandchildren!
179.	A related issue is that most of my generation is credited at the step 1 rate in the summer. This should allow BC Hydro to store more water in the reservoirs for the winter. In the winter I am using additional power for electric heating and purchasing this "saved power" at the step 2 rate. This should be equalized over the year.
180.	I believe that the purpose of this survey is so that BC Hydro can tick the box "consulted the stakeholders", and then continue on to do whatever they intended to do anyway. My response to potentially losing credits will be to install electric heating to ensure that I don't have credits in the future.

181.	Survey is flawed as some questions i had to answer even if i disagreed with both answers. I don't agree that the original intent of net metering was to be limited to customers consumption. If that is true why did Hydro allow 350+/- installations and why was the limit raised to 100 Kw. There should have been some survey questions asking if I agreed with any of the interim changes. By the way I disagree with all the interim changes. By limiting the type of questions you are not getting a true customer feedback so survey is skewed.
182.	More promotion and support for installation on schools and warehouses as well as the south and west facing balconies (instead of the vertical panels) on high rises all over VCR Burbaby and beyond
183.	According to the March 18 2019 webinar, in 2009 BCHPA set the price paid for excess generation equal to the price paid that year for electricity generated by SOP generators (9.99 cents per kWh). I believe that the principle of paying for electricity at a rate equal to the price paid to other small generators is a fair principle, as did BCHPA in 2009. BCHPA clearly made a mistake by allowing some net metering program generators to wildly over-generate, contrary to the intent of the program. However, fixing this problem by punishing those net metering customers that are behaving according to the principles of the program is not a fair solution. I believe that BCHPA should address the problem of over-generation by a very small number of the 1800 net metering customers directly; perhaps by moving them out of the program to the SOP program. BCHPA could then set the price paid for excess electricity as an average of the price paid to IPPs and SOP generators in that particular year. This has the advantage of being transparent and verifiable, as opposed to the ever-changing and impossible to accurately calculate wholesale price on the mid-C market. Finally, a net metering customer should be able to average their electricity usage over a suitable historical period to establish the generation limit, rather than the over-simplified practice of just looking at the previous year.
184.	No limit on having to ny back power
185.	Customers who have invested in solar technology in good faith should not be penalized by BC Hydro. While it is understandable that BC Hydro does not want customers earning excessive revenue, they must also recognize that sizing a PV system must include future electrical cars and expanded needs. In the past 10 years BC Hydro has been very supportive of PV systems however it seems now that they are concerned about potential revenue. I think BC Hydro needs to remain flexible in their approach to PV systems and encouraging green

	alternative energy.
186.	BC urgently needs community (virtual) net metering to make solar accessible to all (renters, strata, buildings with poor solar exposure, etc.). Community solar (solar gardens, solar farms) is an essential component of solar expansion in BC. This is currently impossible within the framework of BC Hydro's restrictive net metering rules. Systems equalling the average BC household demand (11,000 kWh/y) - which would be covered by a 10 kW solar installation - should not be subject to review by BC Hydro, reducing the administration cost of the NM program. Distributed energy makes sense. The continued insistence by BC Hydro that somehow net metering customers are not providing added value to BC's electrical generation is, simply put, untrue. Net metering customers add considerable value to BC Hydro: They pay for and maintain their installations, resulting in reduced costs to BC Hydro for the production of energy They reduce the cost of transmission, as their excess goes directly to the nearest customers They increase the efficiency with which BC Hydro transmits power over long distances. They delay upgrades on transmission and distribution systems They provide distributed and local energy, which most utilities around the world understand results in disaster risk reduction (from both natural disasters and terrorism), as not all generation capacity is centralized in vulnerable large installations They produce reliable seasonal energy that works particularly well in BC, considering the large storage capacity that we already have in reservoirs They could provide a significant amount of energy to the grid, if like other utilities they were given small incentives to do so, which would result in reducing the need for new large-scale facilities which BC Hydro keeps claiming we will need in the future (e.g. Site C submissions to BCUC).

187.	• Restricting net metering to individual residences would be a very negative move. BC urgently needs community net metering to make solar accessible to all (renters, strata, buildings with poor solar exposure, etc.). • Community solar projects should be a key component of solar expansion in BC.. • 10 kW solar installations should not be subject to review by BC Hydro, reducing the administration cost of the NM program. • Net Metering has many benefits including: o Customers pay for and maintain their installations, resulting in reduced costs to BC Hydro for the production of energy o They reduce the cost of transmission, as their excess goes directly to the nearest customers o They increase the efficiency with which BC Hydro transmits power over long distances. o They delay upgrades on transmission and distribution systems o They provide distributed and local energy, which most utilities around the world understand results in disaster risk reduction (from both natural disasters and terrorism), as not all generation capacity is centralized in vulnerable large installations o They produce reliable seasonal energy that works particularly well in BC, considering the large storage capacity that we already have in reservoirs They could provide a significant amount of energy to the grid, if like other utilities they were given small incentives to do so, which would result in reducing the need for new large-scale facilities
188.	As I understand it, currently I am offered a choice on my anniversary date to either 'roll over' the credits to the next billing year, or take payment. Therefor I don't understand why you ask about extending use of credits? Hydro should focus its efforts on dealing with the REAL problems - site C and 'run of river' producers chief among them. Small producers of Solar PV should not be targeted and penalized for the poor planning and economic decision made on a much larger scale by Hydro itself. agree with limiting excess production for future customers, with a 'cushion' for changes, but DISAGREE with punishing existng Net Metering customers, save those who truly 'game the system' significantly, ie. 'run of river' producers. Additionally, your survey is flawed in that it offers only limited choices for answers and those choices are biased toward the choices Hydro would like to

	make. You are not fooling anyone, only making more critics.
189.	Continue interim solution but ENSURE to allow generation up to 35% higher to ensure that homeowners can fully offset the load of an Electric Vehicle which uses 3,500kW a year. (35% of the average household energy consumption per year). Extend credit lifetime to 5 years to ensure that customers can use their credits at a maximum value and decrease payouts BC Hydro will have to make.
190.	Please don't introduce a cap based on previous usage alone. Allow customers to ramp up their generation at par rates by 20% per year to a max of 100 KWh per household. If you have a hard cap based on previous usage, then you are basically locking out the poorer people who could not afford to install/acquire the electrical infrastructure (EVs Heatpumps) as early adopters. If BC Hydro proceeds with this hard cap proposal it can only be interpreted as a cynical maneuver by BC Hydro to shut down all private renewable power generation at a critical time of Climate Change!
191.	Encourage it.
192.	It is time you brought in Virtual Net Metering so people with bad solar exposure can be part of a larger project. I assume your first question is trying to hide the fact that you want to reduce what you pay for power you buy from your customers. The wording just seems a little slippery. Why can't you just do a feed-in tariff. Costs have come down a lot so you would only have to pay slightly more than your Level 2 rates. (You could learn a lot from the mistakes made in Ontario.) If you guarantee the rate for even 5 years you would stimulate more projects. Each year you could reduce the rate until within a few years you would be paying no premium and you would have actually stimulated the alternative energy field.
193.	At this time I wish to become involved in the net metering program, hopefully in the near future. But will reserve comments until I better understand the proposed changes and the effect on the net metering community.
194.	Please allow for the customer to select the date of the start to net metering. We installed a PV system to first and foremost reduce our Step 2 power consumption. As a customer who was net-meter connected to the grid in late September we are at a disadvantage given we generate very little surplus power credits in the waning fall months. Our credits having been applied fully to our power use rather than at a level to reduce Step 2 consumption to Nil been expended by our December bill and we are back into Step 2 consumption during the months of January and February because we have no surplus credits to draw on. Given that our primary surplus generation months are in the summer

	these credits are applied to our bill in September. We would sooner use our production credits for surplus power generation in the summer in January and February and not have to pay the additional cost for Step 2 consumption than receive $$ credits for surplus production at a renewal date in September
195.	We need to make it attractive for customers to install Photo-voltaic or other renewable energy initiatives. Presently it does not pay to install renewable energy for residential use...installation costs are now starting to increase - pay back is just under 20 years.
196.	Since BC Hydro operates with hydroelectricity and does not have a large base of nuclear or other steam plants that cannot be spun up or down rapidly, I do not see why customers should not generate excess power to be fed back to the grid. If customers were to actually generate more power during daytime hours that was being used, perhaps BC Hydro could invest in pumped hydro or other energy storage schemes rather than customers having to purchase less efficient small-scale energy storage themselves.
197.	Setting a net-zero target is ridiculous, understand that customers are paying out of pocket to produce power that you dont have to produce. Freeing up BCH to sell our legacy power to other jurisdictions at greatly increased profit!! SO BCH needs to encourage this as much as possible. And this is so easy... MIRROR YOUR 2-tier billing in reverse; credit feed-in up to Net-zero at Tier 2 rate (encourages production) and an additional 1329kWh at tier 1 rate, and everything past that at a base daily rate. Then SELL the excess power through PowerEx to other jurisdictions at 600% markup. HOW CAN YOU GO WRONG? Also - allow customers to target production to Net FINANCIAL zero. This makes much more sense for municipal and commercial customers (this includes base connection charges and all the other BCH charges) Assuming you wont allow us to target net combined energy zero (ie, offsetting our Natural Gas GHG footprint, etc) Customers should also be permitted to pool their output - for example a Strata could accomodate a single point of connection and monitoring and billing/credits, that can then be directed/shared/distributed to strata members evenly. Same obviously goes for community Co-Op production systems, AND municipal customers who often have multiple sites, but one or two with excellent production exposure and potential. a purpose built municipal renewable energy production site that can reduce the total municipal energy consumption across all sites. that makes sense.

198.	There is no need to change the net metering program. Leave it exactly as it is
199.	I don't understand some of the choices in the survey such as anniversary or common date as a year is a year. I don't see how someone can game that to their advantage. I don't think hydro is doing enough to promote alternate / distributed energy or preparing for increasing population and rising per capita demand as transportation moves to electricity. I think time of use billing incentives should be available. I struggle with BCH's Step 2 billing as try as I might on the demand side, I cannot seem to avoid/ reduce my step 2. Not encouraging at all. I know The gas company incents it's major customers to shift to off peak.
200.	Net metering is one of the important tools for getting more people to install more sustainable electricity generation options. BC Hydro should be looking for ways to enhance the program, not to detract from it. The rest of the world (and most Canadians) are looking for ways to create a better future. Why is BC Hydro trying to be more "Power Stupid"?
201.	As a Net Meter customer, why am I considered a Business Account?
202.	I am not too affected as I use far more than I produce. This just started as an experiment to see if the cost of equipment was worthwhile. It is not.
203.	ya....don't change it!
204.	Same comment - Be flexible - as a customer who installed solar panels in April 2018, we were informed that we would be able to add to our system to increase our electricity generation potential. We made our decision to install based on this, with the intent to install more panels when we had the finances in place. This would be especially important in conjunction with purchasing one or two electric vehicles. Maintaining flexibility to allow this is important to us and other customers in our position who were not informed of these changes until AFTER we had installed the system. Being able to add to the system was a big influence on us choosing the system that we did and it would not be fair to remove this option from us.
205.	Everyone should be given the opertunity to sell excess power back to BC Hydro. Especially if BC Hydro is saying power is in limited supply
206.	Please articulate your policy objectives.
207.	I feel like the options in this survey were unnecessarily constrained. A more progressive approach to net metering is needed in BC, which actually encourages distributed energy generation. There are many benefits to this approach, yet why is being proposed reduces the incentive for clean and

	distributed electricity generation. **In addition to having a rooftop solar PV system, I run a local volunteer group dedicated to installing solar PV systems on the roofs of public buildings in my community. We hope to educate the public, increase the profile and uptake of solar PV, and reduce the operating costs of local institutions like the library, recycling depot, and community hall. Yet the proposed changes to net metering (and the interim policy) have undermined our efforts. We would also love to pursue community projects such as a solar farm yet this seems impossible under the current and proposed approaches.** **In the year 2019, policies should encourage the production of distributed clean electricity instead of making it difficult, uncertain, and uneconomic. BC should build on its proud history of clean electricity leadership instead of lagging behind other leading jurisdictions in this field.**
208.	**WE ARE IN A CLIMATE CRISIS!!! Switch it back to the way it was where residents can sell back to the grid. I understand that the Christie Clarke Liberals pushed the Site C dam project past the point of economic return. They likely inflated future demand and awarded contracts to SNC Lavalin and others without putting it up for tender. They seemed to have a plan to supply water and power to their buddies in the fracking industry who were creating illegal hydro dams. The only reason I can see for you discontinuing the program is due to your commitment to a huge dam and worrying about having a surplus of electricity. Well that situation was forced upon us by the former provincial government. Hard working individuals who want to reduce their carbon footprint and hydro bill by producing their own power and then some should be encouraged to do so. Investors who bought generating equipment with the expectation of supplying more than their own needs and contributing to a clean energy future before you took it away, should not be penalized for our former Premier's shenanigans.**
209.	**I believe the BC Hydro should be supporting the installation and generation of other forms of renewable energy on peoples' homes. We need to fully transition to renewable energy for our homes and transportation. Allowing and supporting this transition means creating good policy and incentives for people to generate their own electricity, especially with electric vehicles becoming the new movement in transportation.** **Net metering should pay back to customers what they generate at a rate that makes sense in fair market value.**
210.	**1) Regarding Sizing of Net Metering System to match CURRENT consumption:** **The proposed change to allow for sizing to allow greater future consumption MUST be made. I oversized my current solar system, knowing that I would change to an EV (electric vehicle) and I have done so within a year +/- of solar installation. This is crucial for a large % of EV owners will undoubtedly install**

	home solar. When EV is established in the province (only 10 yr away!) BC Hydro will wish that they had developed a widely dispersed production capability!! 2) There should be no attempt made to disincentivize Net Metering or Dispersed Generation by customers. 3) Gradfathering: BC Hydro should retroactively change the rate schedule to reward overproduction, with a preferential rate and should maintain that rate structure. By stimulating solar etc the public/ BC Hydro ratepayers will not be adopting huge debt and interest deficits for the public utility.
211.	Get rid of the interim changes and go back to the way it was. Anything else is just tacitly discouraging installations.
212.	This whole approach is not fair to customers who have an opportunity to generate small amounts of power in exchange for payments from Hydro. The issue of offsetting the customers power use ONLY is a red herring and should be removed from the net metering program. The program should be a straight forward program that allows people who want to generate power on their own to be able to do so. The philosophy should be that Hydro will pay the going rate for power generated by "Micro Generation" that would be the same as it costs Hydro to generate its own power. This idea would mean that a unit of power generated at a micro site would be paid for at LESS than what the same unit of power provided by Hydro would cost. This cost disparity means that Hydro does not end up paying excess rates for Micro Generation, while the customer still is taking all the benefits of connection to Hydro. It also means that Hydro does not subsidize Micro Generation, which is reasonable. This Micro Generation payment would then allow the Province to obtain power from all over in small quantities and also encourage generation of "for profit" generation. When I say "for profit" I mean anyone who can generate power BELOW Hydro's cost of production. This would be a good measure of how efficient Hydro is in generating power and possibly a major embarassment if many small Micro Generation providers spring up because they find it easy to generate power at Hydro's cost and make money at it. This would encourage small power generation at sites that may be of little or no interest to Hydro. These sites may be wind, sun, water, etc. The previous small power programs would have been fine but Hydro seemed horrified that "someone might be making a bit of money off of us" by installing generation that exceeded their consumption. This should have been dealt with

	by my suggestion of lower the price paid for power rather than over-reacting and cutting the whole thing.
213.	When would we be able to receive carbon credits.
214.	I am still very unclear based on the material what exactly the price increase means, but I assume that it will not be to the customers advantage and that is why these changes are being made. You do not state explicitly if the 'Wholesale price" will be less than the current price we are being paid back on any energy generated. At a MINIMUM, we should get back from BC Hydro what we would have paid in either Tier I or Tier II pricing based on our energy consumption I think that customers should be given eh opportunity to generate as much power as they want and reduce their reliance on the utilities. In an ideal world every customer is generating power. I do not think that BC Hydro should be making money off of the power we generate as customers who have invested systems to be greener, reduce their carbon footprint. In no uncertain terms should be penalized as a user and be limited in my production for a system I have already paid for. The only way the economics work is if I am given the opportunity to generate power to pay for system that only has a lifespan of 25 years. i am disappointed that BC Hydro is reneging on their program and attempting to make retroactive changes when Have invested a significant sum for my system and the economics of it paying for itself was based on the net metering program parameters.
215.	I am not interested in producing more hydro than I am going to use on a daily basis... it is a long term plan to try and reduce the annual consumption... so for this home at this time I have two 200 amp systems as have a handicapped section of my home .. 1500 square feet and heat pump not connected to the solar... future would like to add 26 panels for that section of the house... but as said not interested in providing the majority of consumption... just relief. Both sides of house consumed about $8000 per year from the grid at this time... the solar should reduce the larger section 4500 square feet by about 30% over 12 months.
216.	is the system broken? What are you trying to fix....in simple terms with no BS
217.	The survey does not adequately explain the details of the questions and the options offered force a selection of two undesirable selections. In plain terms the program should pay out the same as it charges customers. I will add a battery bank and go off grid if BCHydro reduces my credits now that I have made a large financial investment in my solar array.

218.	Other than [BCHydro] paying the marginal cost for power there should be NO restrictions. The "concept" that net users are "leaches" on the grid/other users, ignores the benefits .... local production provide offsets to other demands lessening the demand/size of the grid and may allow local isolation during grid failures.
219.	Need a little more information
220.	Trying to limit generation to the net load reduces the opportunities for systems that can reduce peak loads. Solar generation could be sized to offset air conditioning loads, one of the highest load periods for BCH, but this could result in excess generation at cooler periods. The energy is of greatest value to BCH at peak load times, so incentivising generation at peak load hours could be beneficial to the system.
221.	don't want to see any reduction in the value of my generated amount
222.	Not needed
223.	Repeat :Pay wholesale price for all net metering resulting in production greater than consumption. BC Hydro should have put this in the program before they started it
224.	Rather than considering production/consumption ratios to restrict abuse of the net-metering program, it would be much simpler to restrict buy-back to 50KW. An individual can install a system up to 100KW, but BC Hydro will only buy up to 50KW. This provides small systems with the levity to undertake minor upgrades over time (i.e. accomodate an EV or two) without penalty, while dissuading commercial ventures intent on generating electricity for profit (which is illegal in BC, no?).
225.	energy created should be valued the same as energy produced by both parties in the arrangement. Why else would anyone install an energy saving alternative and become grid connected. Is my energy produced any less valued at the time created? No!
226.	Changes to the way people consume power are coming. Grid tied EVs are coming. Small scale power storage is coming. People want to be a part of positive change, and would buy into community solar co-ops and other progressive ideas if the policy was there to support it. BC Hydro should embrace these changes, instead of resisting them. The dams give flexibility in production, use that flexibility to encourage as much solar as people want to produce.
227.	Regions on deseil generators like Haida Gwaii should be allowed to generate as much power as they can until generators are not needed.
228.	Allow customers to put as many panels on their residential roofs as they forsee

	they will need at any time in the future of them living in the house.
229.	anything you can do to encourage generation which is low carbon is not only welcome but urgently needed in the face of the global warming crisis we face. While I recognize not everyone accepts this the science is in no doubt. BC Hydro needs to be a face based not emotion based organization and is where you can show true environmental leadership.
230.	I believe the intention of BC Hydro to limit the amount of generating that can be done under the net metering program is wrongheaded public policy. BC Hydro should be compelled by regulation to encourage the broad adoption of distributed renewable electricity generation via programs such as net metering and other incentives.
231.	1. thank you for offering this programme 2. We are able to provide 1/3 the electrical consumption for our home. 3. The electrons are not even tired by the time the get to shine in our lights or TV as the distance from photon to photon again is only a few meters 4. given the generosity of the province and BCH towards the use of electricty for preparing gas CNG for export, we'd like the wealth to be shared
232.	BC Hydro should be doing more to encourage/subsidize homeowners to install electrical generation capacity rather than flooding arable land to create a very expensive hydro dam.
233.	Encourage as much alternative power production as possible, particularly in areas off the grid. Diesel powered.
234.	Any one who is currently enrolled in the program should be grandfathered even though they are not yet approved
235.	It seems to me that grid tied systems make a lot of sense. Transmission distances and therefore costs are lower. Net metering customers pay for and maintain their own systems. Build ups in neighbourhoods would not need as much power to be brought in. Times of drought which might affect the ability to produce hydroelectric power tend to happen in the summer when net metering customers are likely to be producing at their maximum thus decreasing the load on the rest of the system. Small incentives would make net metering more popular thus decreasing the need for new large systems built by BC Hydro.
236.	Why are you penalizing or restricting people from producing free energy at a cost to themselves while you are continuing to destroy the environment and create a dam which is not needed. We already have enough energy and are paying run of the river private enterprise not to produce energy yet we still have to pay for it. Not happy at all about that. There should be more subsidies for

	home owners rather than the run of the river projects.
237.	**I think BCH should act to encourage the installation of self-generation particularly on the household level. I understand this could result in imbalances in the consumption and generation of energy but surely this could be dealt with by time of day tariffs or some program to encourage storage at the residence.**
238.	**You should allow net metering customers to generate excess power and buy it back at a slightly reduced rate from what you sell it to us for. After all, only BC Hydro benefits from this, by not having to build new infrastructure or dams, and the wholesale / retail price difference would allow BC Hydro to maintain and upgrade their infrastructure. The current restrictions are far too conservative and seem designed to slow the progress of energy production by individuals. The whole premise of restricting people to "only their energy needs" is faulty. Why restrict us to that? By allowing us to generate electricity at all that can flow back to the grid, we are already energy producers. You should be seeing us as partners producers, not as a threat.**
239.	**BC Hydro should ensure that inspectors sent for inspecting the installation do understand what they are doing**
240.	**This whole thing is becauseBC Hydro is generating more power than we will need so you are trying to restrict people power.**
241.	**IF possible, to save all parties involved time and money I think BC Hydro should not require a net metering application for systems under 10 or 15 kW. Or the existing application process should at least be streamlined for small systems.**
242.	**This is a typical government program. Get the public interested then change the rules to favour the government. We have spent thousands of dollars on going Green. Good for the planet, right. But because the B.C. government can`t manage their books they go after the people who are actually willing to work and contribute to the planet, so they can indirectly have more money, my money to give away to the deadbeat welfare trash. I spent my after tax dollars to do my part for the environment, but the government says to themselves these people must have to much money, change the rules and get their money. There is a saying " eventually you run out of other peoples money".**
243.	**Go back to being able to sell excess power back to BC Hydro and cancel Site C.**
244.	**Great program...please don't mess it up...make it as positive and possible for more people to move this way.**
245.	**Should be fair and equal. Same price for what we pay and sell should me the same. Only fair.**
246.	**As a consumer and investor in hydro, it is very one sided to change the program. I am entitled to recover my investment, if hydro doesn't need my**

	power then why are you building dams?
247.	Just don't turn it into something else that contributes only to lining the pockets of Hydro management, like most everything else Hydro does. I'm so sick of being ripped off by your @#$%^%$ @#$ $%^% corporation!!! Give us all a @#$%$^&* break, for once!!!!!!
248.	1) We need to encourage more small scale generation. 2) price paid for credits should equal price customer is charged 3) credits should be transferable between same corporation; ie different locations can draw credits from primary generating facility
249.	If a customer is willing to invest the money to go with solar Net Metering is perfect, thank you BC Hydro.
250.	BC Hydro signed contracts with net metering providers. Please respect those contracts. Those of us who had the foresight to invest in PV (in my case $32000) should not now see that investment diminished. I believe in energy conversation locally, provincially, nationally and globally. Any attempt to remove my contribution to energy conservation says much about BC Hydro and wonderful province I was born in and lived in all my life. I want to make a difference in the province and the world. That's why BC Hydro promoted net zero and I installed a PV system when I built my (Passive) house. Please, encourage small scale net zero projects, but at this point do not change existing net zero contracts. Let's review net zero when Site C if fully operational (2030) at which point changes may become realistic. Buy out the large IPP's/run of rive projects. Phase out (10-20 years) natural gas production facilities. Encourage small scale PV and wind production.
251.	Energy conscious customers want to be part of the solution. For many site-c is seen as a leg replacement for a leg that’s not broken. It flies in the face of openness and transparency. Essentially electricity in bc should be free given the people own the resource yet it’s managed and run in a most inefficient manner. Similar to icbc or other crown corporations people don’t have confidence in gov’t to manage anymore. If site-c funding partially funded rooftop solar and battery storage solutions to normalize the grid loads we would be far ahead of the current proposals, after all this isn’t 1950 anymore. It will be interesting to see if the utility goes with the times or stays a dinosaur when it comes to renewable energies. Flooding 3000 acres and contributing to green house gases doesn’t make common sense.
252.	I think that net meterING customers should be rewarded for their concern for their contribution and their personal investment. Yuo did not give an option for a deserving credit. I believe for our investment we should receive approximately 10% above retail residential rates. Thank you.

253.	Somehow BC Hydro needs to be involved with promoting solar energy, in a BIG WAY.Thanks
254.	We are new customers so can't make an informed decision at this point.
255.	People should be able to have as much generation kneded to offset what they use and over produce for future purposes our future is changing electrical cars and batteries are coming in the near future demand will only get bigger and the expense to put this systems people should get paid for the amount they overproduce it helps with our environment and it educates people of what can be done to become self sufficient why penalize people for overproduction
256.	Get a 1000000 Hous Solar program in place like what the geman goverment have done. Pls see the energy production form solar in europe: https://www.energy-charts.de/energy_de.htm?source=solar-wind&period=monthly&year=2019; 32% of the power for germany is now produce by Solar, Biomass and Wind. This is the futher of power production.
257.	Allow generation that exceeds load. BC Hydro should not limit customers flexibility. It is abusing its monopoly.
258.	It sucks that I buy an expensive system after researching the topic and then you go and totally change the ground rules making my informed decision worthless.
259.	encourage cleaner energy!
260.	Let the market decide.
261.	Please focus on improving the time to process the net metering applications.
262.	If we are to be serious about renewable energy, we must encourage all new installations and the usage of that technology in every way possible. Any excess in electricity flowing into the grid as produced by private installations should allow electricity companies to reduce their production and associated costs by selling without generating. As part of a long-term sustainable strategy, this should not be considered as a negative but a positive. The idea that we can individually produce electricity which can be sold, but not be compensated for it by suggesting credits might eventually expire, makes little sense in such a strategy. If there is too much electricity, reduce the mass generation, not the individual generation. In the short-term, if costs are prohibitive due to an overwhelming increase in private installations (which would be a great event to celebrate, but which doesn't seem to be happening in BC yet), then by all means extend the credit duration as a stop-gap measure while budget and generation requirements are recalculated. Overall, there doesn't seem any sensible justification for not paying customers for electricity generated privately and fed to the grid to be sold by Hydro,

	without generation costs to Hydro, and instead choosing to pay for and then sell excess electricity generated from Hydro sources. If we want to move a cleaner future, we must encourage private sources of generation into the grid, however small a portion of the market that might be, and in turn reduce costly mass generation.
263.	I know we are not Alberta (thank goodness) and they have issues with using coal and natural gas for elec gen...but they have a solar rebate for installation of .90 per watt and we should as well to assist BCHydro now. All existing residential only, solar customers should also be able to retro apply for smaller amount / refund say .50 per watt as we are apart of the solution for BCHydro as we help promote solar in our neighbourhood daily,.
264.	I expect to increase my electrical consumption as I divest the household of oil and gas products and devices. I want to derive this increased consumption from more PV panels, and should not be limited by a generation/consumption ratio. As well, I should receive a higher rate for the power I contribute to the grid to recompense me for the investment I have made. Thank you.
265.	Net metering is a good program and should remain simple and easy for consumers to understand. You will generate distrust by constantly tweaking or threatening changes proposed to solve problems that do not exist at a consumer level. Policy changes should be designed to generate consumer incentives, and program simplicity and stability is a must if consumers are expected to invest in systems that create cost benefits over decades.
266.	- BC urgently needs community (virtual) net metering to make solar accessible to all (renters, strata, buildings with poor solar exposure, etc.). · Community solar (solar gardens, solar farms) is an essential component of solar expansion in BC. This is currently impossible within the framework of BC Hydro's restrictive net metering rules. · Systems equalling the average BC household demand (11,000 kWh/y) - which would be covered by a 10 kW solar installation - should not be subject to review by BC Hydro, reducing the administration cost of the NM program.

267.	this program represents a very small cost commitment for BC Hydro. While offering a number of very positive benefits to the system , customer, innovation and community engagement in a sustainable power consumption model. The existing program should remain the same for an additional five years or when 50 MW /hrs of power is contracted. This will permit certainty for a stronger distributed solar sector to become established. This will create thousands of good jobs while encouraging innovation and growth in the renewable sector at no cost to government and little cost to BC Hydro as the amount of kW/hr. in is small. Solar energy is created in the daylight hours. It is not difficult for BC Hydro to absorb these small distributed loads into the distribution system. I would argue that is some cases this would help reduce or stabilize line loss and reduce costs for the utility. Customers that are installing these systems are investing the capital and risk for a long term payback. There are no fairness issues that I can see in relation to BC Hydro other customers that are not making this commitment of investing in clean energy in British Columbia. The outcome if this change is accepted by the BCUC will be slow or stop grassroots innovation in renewable that is starting to take place in BC by individuals citizens.
268.	Would not want to see the level of credit arbitrarily set at a certain percentage, 10%, above historical useage.
269.	I would caution against creating a situation that encourages behavior inconsistent with other BCHydro objectives. In particular, a relatively small price paid at the true-up date will encourage wasteful use of BCHydro power leading up to the true-up date for those customers that have a positive credit balance. Such behaviour is inconsistent with BCHydro's strong power conservation focus that has been very successful for more than 10 years.
270.	Local generation with centralized energy storage in hydro-electric dams + centralized generation when needed. This is the way forward, in my opinion.
271.	It is important to continue investigating other system storage options to handle peak loads and alternate energy supply time shifting. Are Redux flow batteries an option. Do we need to move to time-of-day billing soon?
272.	• BC urgently needs community (virtual) net metering to make solar accessible to all (renters, strata, buildings with poor solar exposure, etc.). • Community solar (solar gardens, solar farms) is an essential component of solar expansion in BC. This is currently impossible within the framework of

	BC Hydro's restrictive net metering rules. • Systems equalling the average BC household demand (11,000 kWh/y) - which would be covered by a 10 kW solar installation - should not be subject to review by BC Hydro, reducing the administration cost of the NM program. • Distributed energy makes sense. The continued insistence by BC Hydro that somehow net metering customers are not providing added value to BC's electrical generation is, simply put, untrue. Net metering customers add considerable value to BC Hydro: o They pay for and maintain their installations, resulting in reduced costs to BC Hydro for the production of energy o They reduce the cost of transmission, as their excess goes directly to the nearest customers o They increase the efficiency with which BC Hydro transmits power over long distance o They delay upgrades on transmission and distribution systems o They provide distributed and local energy, which most utilities around the world understand results in disaster risk reduction (from both natural disasters andterrorism), as not all generation capacity is centralized in vulnerable large installations o They produce reliable seasonal energy that works particularly well in BC, considering the large storage capacity that we already have in reservoirs o They could provide a significant amount of energy to the grid, if like other utilities they were given small incentives to do so, which would result in reducing the need for new large-scale facilities which BC Hydro keeps claiming we will need in the future (e.g. Site C submissions to BCUC).
273.	Net metering should be encouraged and enabled, not discouraged and obstructed.
274.	BC Hydro policy should promote solar power generation or Micro-Hydro, Micro wind generation as much as possible.
275.	The information sheet you just issued should be adjusted to present day pricing for solar panel installation. Our 3.9kw solar panel system cost us well under

	$10,000 (approx. $8,700 incl. taxes). So the pay back period is considerably less than you predict. I believe you should be encouraging the use of solar panels by better representing the facts.
276.	In addition to providing flexibility for residential, business, and public net-metering customers to install needed energy generation capacity (solar, etc.), BC Hydro should also support the development of community solar generation facilities. This would allow customers who are not able to install a solar generation system themselves due to site limitations or insufficient resources, but who want to participate in helping to generate energy locally, to do so by investing in a community solar "farm". For this to happen, BC Hydro should allow "community (virtual) net-metering" whereby Hydro customers who have invested in the solar farm (perhaps through a coop) receive credit against their own Hydro bills in proportion to the amount of solar generated power that is produced by their portion of the solar farm panels. Overall, Hydro should be supportive of both residential and community (virtual) net-metering forms of distributed energy generation, because it makes sense to maximize the amount of energy produced close to where it is being consumed. In that way, all Hydro customers benefit because costs of supplying power are lower. Moreover it's the right thing to do for climate change!
277.	As long as we continue to get the credit for earned that reflects the cost paid, I am happy
278.	could not undersand what you meany by grnadfathering existing customers for 5 yrs... an existing customer is already existing??
279.	The manner in which the debate and announcement of proposed changes to the Net Metering Program has been very hasty and does no justice to the way in which a BC Crown Corporation should treat its customers and clients. What purpose does the rush to implement the proposed changes have on the bottom line of the Corporation? This proposal and lack of time for owners to respond is a debacle which is not worthy of BC Hydro or the Province of BC.
280.	Sure. Let's realize the potential of solar. e.g. strata buildings, community buildings, community solar farms especially where an individual home is not sunlit but nearby property is. Why do any of this? Because it's 2019.
281.	I think BC Hydro should be paying for and allow excess production. You say you need more electricity and distributed generation provides security, savings in wear and tear on transmission lines, and huge advantages for BC Hydro as the customer pays for the infrastructure. I think BC Hydro should actually be providing incentives for people to go solar, as happens in many jurisdictions, rather than barriers.

282.	Generating electricity via solar panels should have equal value with the ongoing rates that Hydro charges customers. It is certainly cheaper than the IPP project remuneration that currently spends vast monetary resources on corporate projects. As well, excess power generated can help to fill the need locally, thus saving energy lost through long distance transmission and help meet increased demand for electricity to meet the needs of a changing economy to deal with climate change (electric cars). There is a considerable investment expense in setting up private solar generation projects, embarked upon, in many cases, as an attempt to address climate change on an individual level.
283.	Not sure that I understand the current settlement provisions. In my case there is a credit to my account at the end of the year for extra electricity used -- as a credit against which future billing is paid. So right now I'm building a very modest credit which is covering my billing and I'm not having to pay anything (apart from the original capital investment in solar panels, which will never be totally recovered). As I understand the re-pricing that is suggested - the credit would be calculated on the daily market rate for electricity and as a result would be less than the current fixed rate paid. Instead, would it make sense to provide the credit in Kwh's vs $'s and let them accumulate as long as the homeowner wants into the future? At the same time require the homeowner to pay the monthly connect fees. It would seem fair to me that all homeowners should be required to pay the monthly connect fees.
284.	I urge BC Hydro to recognize the emergency nature of the climate crisis facing the entire world, and to act with leadership on the world stage. With the extraordinary level of hydro generation we have in BC, it is essential that we look toward our electricity generating capacity from the viewpoint of how to help Canada as a whole, and our geographical region specifically, transition to 90%-100% sustainable electricity-based energy consumption. Net metering should be viewed as a vital part of that transitioning, and BC Hydro should do everything possible to make net metering accessible to anyone in this Province.
285.	Can we get batteries to store the excess power we generate?
286.	I can see that changes were needed as it wasn't the intended purpose of the net metering program to purchase commercial power. I am speculating that the big net metering producers are producing through hydro as size of a PV system and the cost would not make commercial sense. No one can make a business base for investing in grid-tied PV as the cost is prohibitive and production doesn't warrant it. You do it because one wants to be self-sufficient or want a green footprint but not to make money. I live in 5 acre property on Quadra Island and our 35 PV panels are producing

	somewhere around 11,000 kwh per annum which is short of yearly average consumption of 19,000 kwh. We have a water license and hope to generate the balance of power with hydro during the winter and shoulder seasons. My point is that we have invested a lot $$ and our property just happens to have an area with decent sun exposures without too much tree obstruction and we have a a creek which will provide seasonal water flow for power generation. When I walk over my neighbor's properties in our whole area, none have the ability to produce hydro and very few have the unobstructed view to set up PV panels. I understand that net-metering graph was showing a growing trend but I really wonder what that graph would look like in ten years from how. It makes no financial sense to put in solar grid-tied PV without government incentives. The people that are willing to pay for their grid-tied PV systems is extremely limited. I only have to drive through ground zero "green" of BC, Oak Bay, and for all the "environmentalists" I have yet to see solar panels and you won't unless there are substantial government incentives. I can understand that changes needed to be made but from sitting on the sidelines I think BC Hydro reacted poorly to an easily fixable problem and got some very unnecessary bad publicity for it. I am fully supportive of Site C but residential power generation wasn't going to replace the need for that power. We are lucky to have a utility like BC Hydro and the cheap power rates we all pay.
287.	If you want to encourage homeowners to help our electrical footprint, you need to make sure they see the advantages. I hope any changes are only for large scale operations. I hope that residential customers do not see much difference. We have committed our hard-earned, after-tax money to improve our environmental impact on the world. But if my solar panels create a little excess, and BC Hydro can use it, I would hope to get credit for it. I'm not running a business from this, I am just a homeowner. People talk about doing the right thing for sustainability, and some of us have stepped forward to act instead of just talking. I hope BC Hydro will see how many homeowners supporting alternative forms of generation is a good thing, beneficial for all of our society.
288.	Why is there a discrepancy between the power my solar grid has produced, and what my hydro meter shows?
289.	Encourage grid-tied solar PV... work with it instead of trying to limit it.
290.	encourage others to provide electricity to BC Hydro as much as possible
291.	I think there should not be changes in place that discourage residents from

	working towards a better way to reduce their electricity expense by receiving a credit through the net metering program.
292.	Some questions in the survey only had options to choose a preferential answer provided, however, there were some questions that I wouldn't want any of the options to come to pass, but had to chose one. Therefore, I think you're data may be skewed.
293.	We have found the billing and adjustment credits for Klw generated very confusing, even when explained by our installer and BC Hydro.
294.	I wish that BC Hydro could be trusted.
295.	Is the proposal to change the rules for all customers, or just those few who generate more than their needs?
296.	I would like to see more institutional involvement to offset the original installation of alternative energy production. At present, BC does not charge provincial sales tax and that is supposed to suffice as our incentive. That's the best we can do? Instead of wasting billions on the site C fiasco, BC could paid for half the cost of 500,000 solar systems generating 5000 kWh. You can do better. Let's invest in alternative energy, help us out. I didn't wait for BC Hydro or the Provincial Government to take a stand. My system came out of my pocket so get on board, the rest of the province is carrying you.
297.	I am happy with the net metering program. I believe it is not good to put barriers to green energy. I believe if a person has a locale that presents opportunity to produce power they ought to be allowed to make a profit of their investment. Maybe in the distant future when our neighbours are off fossil fuel this should be considered. BC should be exporting more power and developing every green opportunity that is economic. I also believe net metering participating at the retail level not wholesale is the least that can be done to encourage installations. I mean it is not like we are the Liberals giving retail rates in long term contracts to donor buddies for micro hydro.

298.	**BC urgently needs community (virtual) net metering to make solar accessible to all (renters, strata, buildings with poor solar exposure, etc.).** **• Community solar (solar gardens, solar farms) is an essential component of solar expansion in BC. This is currently impossible within the framework of BC Hydro's restrictive net metering rules.** **• Systems equalling the average BC household demand (11,000 kWh/y) - which would be covered by a 10 kW solar installation - should not be subject to review by BC Hydro, reducing the administration cost of the NM program.** **• Distributed energy makes sense. The continued insistence by BC Hydro that somehow net metering customers are not providing added value to BC's electrical generation is, simply put, untrue. Net metering customers add considerable value to BC Hydro:** **o They pay for and maintain their installations, resulting in reduced costs to BC Hydro for the production of energy** **They reduce the cost of transmission, as their excess goes directly to the nearest Customers** **o They increase the efficiency with which BC Hydro transmits power over long distances.** **o They delay upgrades on transmission and distribution systems They provide distributed and local energy, which most utilities around the world understand results in disaster risk reduction (from both natural disasters and terrorism), as not all generation capacity is centralized in vulnerable large installations** **o They produce reliable seasonal energy that works particularly well in BC, considering** **the large storage capacity that we already have in reservoirs** **They could provide a significant amount of energy to the grid, if like other utilities they were given small incentives to do so, which would result in reducing the need for** **new large-scale facilities which BC Hydro keeps claiming we will need in the future (e.g. Site C submissions to BCUC).**

299.	The only fair way to do this is to reimburse customers for the power at the same price they are paying for power from BC Hydro regardless of the time of year the power is produced and the energy demands at that particular time. Otherwise what incentive would there be for people to make these clean energy investments? The way it will work for most customers is that they will be generating excess energy during the summer months and using those offsets to help fund their winter power consumption. If the government wishes people to start thinking seriously about net zero power consumption for residences, then make it appealing for people to buy into the program. Any considerations to reduce these incentives will cause the program to fail. BC Hydro needs to figure out a way to store the excess power produced if it is produced at a time when there is less demand. The decision to get into solar for your own residence is a tough one considering the very long break even period - over 20 years. So make it more attractive to potential net metering customers, not less attractive. I am in the process of considering whether to get involved in the program and even with the current criteria it is a questionable option, based strictly on economics. But I see the environmental advantages and therefore would like to do it. But I won't if the rules change to make it even less desirable economically for me. I urge the Utilities Commission to be very careful in changing the rules here as it will cause the program to fail. My feeling is that the program is on the brink of becoming very popular and taking off. but that could change very quickly if the rules become more restrictive and less attractive economically for potential customers.
300.	During this entire process you have been addressing the majority regarding a problem with a SMALL minority. Close any loop wholes that allow abuse of the system and move on.
301.	Thanks
302.	I wish I could have gone back in the survey and changed an answer but it wouldn't let me. I would like to see a clearer reflection on my account of what I have generated each day or month as opposed to only the amount I have used as a net amount. I can't compare my recording from my solar panels to my usage easily.

303.	Net Metering to me is an opportunity to offset my carbon footprint. My PV setup produces on an annual basis less than I consume. The credit at the anniversary date is an irritating exercise as in reality I wish to bank kilowatts for use in the winter and my anniversary date is at the end of summer! As most PV systems are not put up in midwinter I suspect my situation is common. I definitely would want to increase my production capacity when I purchase an electric car. The Net Metering program should be designed in such a way that it is to the advantage of every homeowner to install PV or other small scale power production just as it is to their advantage to install and engery efficient water heater or heat pump
304.	On page 13 of webinar (Objectives of the Proposed Changes) the last two bullet points were obscure and needed more clarification, i.e. we did not know what tariff refers to, what the existing program practices are, or what is deemed to be unfair between participating and non-participating customers.
305.	Pay the customer 10% less than wholesale for excess generation. This offsets the loss of revenue. In return credit the customer for the disconnect/connect charges to help encourage more home owners to purchase systems. There should not be a limit on size based on use. When the home is sold or business owner changes the new home owner or business may need more or less and should not have to change their generation capacity. Islanders, especially would be a great target for self generation with a profit to BC Hydro as this in turn will reduce having to upgrade power system to the islands.
306.	I think the system should allow for a +20% of current usage. (E.g. I sized the system for my estimated future load of using EVs.) Is BC Hydro looking at micro-grids (e.g. similar to what Australia is moving towards) as it significantly decreases the infrastructure costs?
307.	we do not believe that non- participating hydro clients should make the net metering system any different then what we already have. We had to pay for our BC Hydro infrastructure as well as our solar, in an effort to reduce our hydro bills.
308.	My biggest concern is that the proposed changes to NetMetering seemed to be aimed at the idea that somehow 'not participating' customers are somehow subsidizing reduced power costs to 'participating customers' - I think that this is grossly overstated. First, in the webinar it was estimated that the money BCHydro paid out to NetMetering overproducers was well less than 1% of the total income BCHydro brought in. Take that less than 1% of those funds and spread it over the customer base of BCHydro (without NetMetering) and we do

	not represent a 'burden' - especially since the VAST majority of NetMetering customers don't overproduce (and that number will be lower if the PV anniversary date moves - as often is a few dollars returned, followed by 2 winter months of bills owed to BCHydro). As well, NetMetering customers still pay the 'other parts' of the BCHydro bill that are not related to how much energy you use. Finally, by being early adopters of the solar technology, we drive down the price of these systems to non-participating customers, so that they too can eventually participate and reduce the demand for larger power generation facilties, and mayve help drive down the costs of storage solutions which will help BCHydro in managing their production demand fluctuations! My next point is related to the idea that NetMetering and distributed energy 'cost' versus actually 'adding value' to BCHydro's electrical generation. In reality, NetMetering customers intially pay for and then continue to maintain their installations, no cost but a benefit to BCHydro or non-participating customers! Next the energy created can be used for local demands instead of having to travel from BCHydros remote generation sites. By not having to send power locally from far sites, this should reduce costs and delay potential upgrades to distribution systems, especially for NetMetering customers operating in areas of continued growth. They also provide for some means of energy production in case of some disaster such as fire, which might cut off transmissions from dams, but with sufficient NetMetering customers, some local power creation and sharing is possible. It seems that BC should be working towards supporting smaller electricity producing installations that all get captured under "NetMetering" as adding to the capacity of distributed energy generation could greatly reduce having to build future large, costly and often environmentally harmful (and poorly regarded) large new hydro facilities, which can have a long term negative effect on the immediate physical environment. While I can see that there will be 'growing pains' understanding how best to manage distributed systems, it should be encouraged versus discouraged. The BC population keeps getting bigger, and energy demands will only be higher. Wouldn't it be great for our public owned BC utility to be at the forefront of figuring out how to make more local distributed energy sources possible!
309.	The question in the survey referring to paying out excess credits, did not have an option for "other" or comments. I am considering a solar PV system. Sizing the system for my current needs must take into consideration: solar panels degrade over time, so 15 years from now they may be reduced by 10%, or 20% in 25 years. Also, weather is not constant, and can fluctuate production by =/- 10% or maybe slighly more as the effects of climate change become more apparent. Therefore, sizing a solar PV system at 125% or even 130% of a typical weather year would produce in year 1, is reasonable and practical. In years that the system overproduces, it is reasonable to get paid for that power, but not at a

	wholesale price. As of today, Hydro sells power at 14.8785 cents per kWh to residential customers at step 2. **How can Hydro justify that they are losing any money in the above scenario?**
310.	**Thanks for the opportunity to provide feedback.**
311.	**With the new size restrictions, I don't understand why you would bother changing the current credit payment at 9.99 cents. The issue you are correcting for big payments on over producers will be gone going forward and is just going to upset a lot of people or be misrepresented in the media. Move the 5 heavy Hydro users to a special SOP and carry on with the current price as the financial impact of the remaining net-metering customers is so small for the loss of goodwill BC Hydro will likely receive. Change of anniversary date date to March 1st or customer selection is a positive and required change. This will reduce over producing payments even further to continue with the point above for solar customers.**
312.	**We are a small producer and we cover our consumption with a small surplus. We feel that BC Hydro should pay the minimum retail rate for our surplus, adjusted annually to reflect BC Hydro's annual increases in retail prices.** **We are pensioners living on a small pension. We invested hugely in our solar arrays as we wanted to do our part in helping the environment. We are angry that BC Hydro is considering ways of confiscating our investment and returns on investment. For a large, rich corporation to try and take advantage of a pensioner is unconscionable. Shame on you, BC Hydro!**
313.	**At the April 1st seminar BC Hydro started that it can not make a profitable business out of the net metering program for a variety of reasons, too few customers, unreliable generation, dam management too complex and so on. What wasn't discussed were the required conditions to create a profitable business model. However, it seems that other companies in other jurisdictions in North America are already there eg Washington State where customers can choose which company should install and operate the PV system on the customers house. The difference is the political will to create an environment that allows for such a business to exist. Mankind found a way to land men on the moon and land a machine on Mars, surely managing a dam is somewhat easier than that. Compare what is happening in the US (even with Trump promoting coal and oil) and Europe. BC along with the rest of the world needs to find a technical and business solution that allows the proliferation of programs like net metering and even the small power generation systems that use renewable energy. The motivation for modifying pricing conditions so that money can be saved and larger amounts of money returned to the BC government as profit (which in itself is another discussion completely) do not inspire me to think that BC will be leading or even participating in what is undoubtedly the future of power generation.**

314.	We joined the programme because our property faces south and is in the sun most of the day. We thought it would be perfect to be able to be energy neutral. We are considering getting an electric car and have not researched what the electricity consumption is for charging the vehicle. If necessary, it would be nice to be able to increase the number of our solar panels to maintain net neutrality. Our intention was never to try and turn a profit on this adventure.
315.	keep flexibility and fair practices as cornerstones for this emerging customer group
316.	Why would we invest $12,000 in solar PV to generate our own electricity (sustainably) and then not be able to write down this investment over an appropriate length of time and realize the benefits stated at the program's outset? A 5-year grandfathering option will see us lose money on this investment! Extensions and/or compensation should be granted to existing solar customers who are offsetting their consumption responsibly as envisaged by the program. Solar customers should not be penalized financially when BC Hydro makes some poor choices on IPPs and then decides to change its horses in mid-stream. Several times during the webinar, the facilitator stated that "ratepayers shouldn't be subsidizing solar"; however, as ratepayers we are currently financing Site C to provide electricity for a future LNG industry that will have devastating emissions, seismic, and negative climatic impacts during a time of extreme environmental crisis!
317.	I don't trust our BC Hydro as a corporation & that any changes they make are fair to the net metering program. It feels like we are in a vacuum of bad decisions & can't get out. I sure hope BC Hydro doesn't bring a foul taste to our mouths on the net metering program. I hope any revenue generated by BC Hydro DOES NOT go into general revenue for the Provincial Government and stays within BC Hydro.
318.	Residential scale solar installations (~10kW should not be subject to review by BC Hydro. Distributed generation makes the most sense for BC and if homeowners are willing and desirous to contribute to that end at their own capital cost, then BC Hydro as a monopoly holder on power generation and distribution should encourage and support that. Local generation of power in a distributed grid will reduce transmission costs.
319.	I would appreciate if BC Hydro or the province, whoever is driving this change to the initial net metering agreement, would make public in very clear terms why this is occurring now.
320.	Encourage renewable energy; make net metering as simple and rewarding as possible

321.	**Yes! British Columbia urgently needs community [virtual] net metering to make solar accessible to all - from renters to buildings with poor solar exposure etc etc]** **Community solar - i.e. gardens, farms - is an essential component of solar expansion in BC. This is currently impossible within the framework of BC Hydro's restrictive net metering rules.** **Systems equaling the average BC household demand [11,000 KWh/y] - which would be covered by a 10 kW solar installation - should not be subject to review by BC Hydro, reducing the administration cost of the NM program**
322.	**• Net metering customers are major contributors to energy stability and aggregate value of the power grid, and their contributions should be made as affordable, simple, and economically viable as possible. Local generation spreads out the cost of generation to voluntary participants in energy production, it benefits the grid by reducing the overall distance energy needs to travel, and it increases the resilience of the province as a whole relative to disruptions of the grid, by dramatically increasing the number of generators and building local self reliance. Net metering customers should receive MORE, not LESS, support from BC Hydro.** **• BC Hydro should take steps to make net metering and local generation available to all residents of BC, including those economically unable to invest in PV systems. One way to do this is by facilitating and incentivizing community solar projects, in which communities can collectively develop net metered solar installations. Net metering rules should take community solar installations into account and encourage them through subsidies, rebates, or other means.** **• Reducing the regulatory burden on small installations would serve everyone well -- BC Hydro, customers, and the province as a whole. Small projects -- such as those producing not more than 150% of average household energy use -- should not require permits or red tape. Especially for BC Hydro, this move would reduce costs while also encouraging initiatives that are beneficial to all.**
323.	**I think the program is a fair with displacement of energy use at applicable residential rates, either tier 1 or 2. Other provinces provided higher incentives but they have coal or nuclear systems. BCH system is hydroelectric so most sustainable power generation process we have.**
324.	**I do not produce solar energy or wind at the moment, but know it is necessary for the future - it is solcially and morally unacceptable to consider paying customers less than what youcharge them for power the world needs more alternative energy producers- when BC Hydro initiates programs that discourage this then I will fight your company at every opportunity**

325.	**Much was made of the 'huge' total payments made TO net generators, with reference to a very low number of accounts. The numbers simply don't work to support this being a solar issue... the arrays would have to be massive, so I believe it relates to 3-5 hydro producers instead.** **Revising the program, which is really designed to be for solar producers, to A) sort out what is a small cost in the scheme of things, and; B) is the result of a handful of hydro generators rather than solar generators; is simply ridiculous. With the massive costs of Site C, the subsidies promised to LNG for the power... all of which will be supported by the ratepayers who are 'unfairly' paying for the excess production of 3-5 hydro generators, is patently absurd. The differences are orders of magnitude apart. I fully expect this will come to light eventually and BC Hydro won't wear it well.** **It also wasn't made clear whether the 'excess payments' were the total value, or just the 'bonus' amount over and above what the fair market rate to BC Hydro would have been. If in fact the number was 'total value', then the actual cost over and above market rate would be much less than was advertised. Was this purposely left vague to advance the BC Hydro agenda??**
326.	**Current use is a poor measure of what people's consumption of electricity will be in a decade, let alone several decades from now. The purchase of solar panels is a 3-4 decade investment. So it makes sense for people to be anticipating future draw on their solar capacity for electric vehicles, heat pump technology that works well below zero degrees, etc. as people shift away from fossil fuels. The suggestion that a 10% buffer may provide people with sufficient production capacity to anticipate future consumption over the next decade(s)requires much more discussion and defense if BC Hydro is going to take this position, without discouraging people from organizing their investments to get off fossil fuels completely.**
327.	**There should be an attempt to encourage renewable energy production by residential home owners that is separate and different from IPP agreements. At present residential owners are discouraged while in the past large incentives were given to IPPs.**
328.	**If Site C is $83-95/megawatt hour, you should pay residential solar customers at least that.**

329.	**The net metering program positively embraces two very important aspects:** **1. It allows customers to assume personal responsibility for their own energy consumption and makes them more mindful of their consumption habits and patterns. Customers over time will be able to lessen their environmental footprint.** **2. It allows customers to advance a greater public good in this era of grim IPCC warnings. Distributed energy generation means less energy line-loss from distant grid sources. In BC, hydro dam water levels can be kept incrementally higher for peak periods and emergencies. This will probably become more critical with increasing climate uncertainty and serve to engender greater flexibility and resiliency to the provincial grid.** **BC Hydro needs to seek ways of encouraging greater participation in the net metering program. Our public utility will be made stronger for all by promoting and expanding distributed energy feed-in.**
330.	**I believe that the square footage of one's home should come into play when capping the amount of KWatts that can be produce by an individual residence in one day.**
331.	**Keep it fair - meaning keep the Net Metering credit rate attractive to customers.** **Existing customers were the pioneers of solar installs, they should keep their existing systems, especially since they make up a small portion of the installed projects.**
332.	**Actually I think the utility should be encouraging more individual generation of energy to reduce reliance on big projects such as Site C which I do not support. I don't think you should be limiting the amount of energy produced to just offsetting the amount personally used.**
333.	**Interested in solar power especially totally off grid generation for our own use only. BC Hydro has very poor customer serv1ice and would love to disconnect.**
334.	**I lived and worked in southern California for over 12 years and thus became acutely aware of the long term demands that will face our country with regards to electricity. California is essentially the same population as Canada with marked less water based resources. Edison Electric, with State government support, provides rebates and incentives for individuals and businesses that retrofit their buildings to capture solar energy and provide it back to Edison. The CA State Legislation presently has a bill in motion where by all new home and business builds would be required to include a basic solar capturing mechanism in their construction. We need to be taking on these important initiatives now in BC.**

335.	**BC Hydro states mixed messages:** **Billions are being spent to complete Site C because BC Hydro says the province needs the power.** **Ratepayers are encouraged to conserve electricity (Power Smart) so that the demand for generation is reduced.** **However, the brakes are being applied to the net metering program (BC Hydro wants to reduce the surplus rebate) for approximately 1,800 mostly residential customers. Apparently, BC Hydro doesn't need the electricity after all.**
336.	**BC Hydro wants to change the rules to net metering, is it also planning to breach contracts with run of river installations?**
337.	**Lets double down on net metering and stop Site C while we can**
338.	**I feel that the "you can't produce more than you use" proposal is shortsighted and misses the point of a lot of net metering customers. If you are using solar you can't at the current cost of panels offset your investment by installing more panels. I look at what my installation cost just for the panels and what I get credit for and there is no way that a panel is able to generate profit. (Please feel free to correct me if you think I am wrong).** **Structure the "you can't produce more than you use" to take into account what method of power generation the customer is using. My panels are in shade half of the day due to the trees in the park next door. If you go by what a customer could produce rather than what they actually produce you will miss out on customers that want to make a difference.** **As you note with electric vehicles the province of BC has mandated electric only for new cars sales in 20 years. If a couple today sets up a solar system on their roof or property, then has 2 kids, then purchases 2 hybrid or electric cars, then the kids go to university, over the next 20-25 years (the life of the panels) their energy consumption will change drastically.** **What's wrong with saying "You get the current rate of credit for power up until you are consistently putting more power per year in than you take out. At that point you get only what BC Hydro can sell the power for on any excess per year. If you are using a passive system, (solar, wind) you get treated differently that if you are using an active system, (generator, hydro)".**
339.	**What are the historical averages for the wholesale market? It's hard to agree to a question "get the price that you know or get an unknown price?"**
340.	**Homeowners, after ‘upfront’ purchase of alternate infrastructure, should be able to profit from the benefits of their purchase. BC’s proposed 23 year payback period is not very motivating. In Alberta, the government provides up to $10,000 or 35% off system installation, plus some Cities provide additional incentives. In**

	the US, the federal government provides a reduction of 30% on installation. In BC, we have no incentives and it appears that BC Hydro would like us to be content that in 23 years we have recovered the initial outlay and we can anticipate JUST covering the cost of our future usage. Owners of alternate energy infrastructure should be allowed to profit after recouping initial costs. As a taxpayer investing in my own energy infrastructure, AS WELL AS BC Hydro projects, I should retain any additional load profits from my energy source. Also, moving forward, policies and provisions can be changed. But original incentives must be retained for the integrity of the alternate energy program. BC must develop more environmental purpose.
341.	My understanding is these revisions have mostly been prompted due to the five NMP customers with hydro/water wheels that have been producing an excess amount and receiving a payout of $250k. Separating the Hydro from the Solar customers instead of lumping us together would allow you to make more efficient and targeted changes to the Hydro Net Metering Program customers and not punish the Solar customers by making changes that will have a negative impact on us. As you said the majority of customers have always intended to be net zero - so let us make the positive environmental impact of our long term investment actually payoff.
342.	Homeowners, after ‘upfront’ purchase of alternate infrastructure, should be able to profit from the benefits of their purchase. BC’s proposed 23 year payback period is not very motivating. In Alberta, the government provides up to $10,000 or 35% off system installation, plus some Cities provide additional incentives. In the US, the federal government provides a reduction of 30% on installation. In BC, we have no incentives and it appears that BC Hydro would like us to be content that in 23 years we have recovered the initial outlay and we can anticipate JUST covering the cost of our future usage. Owners of alternate energy infrastructure should be allowed to profit after recouping initial costs. As a taxpayer investing in my own energy infrastructure, AS WELL AS BC Hydro projects, I should retain any additional load profits from my energy source.
343.	Make it as favourable to the private single householder as possible. Make a rebate system for installing as big a system as one has room for on all properties in south half of province or the whole province if the panels become efficient enough. Or make a loan up front to be paid back with credits from generated solar. PS. I did not watch your webinar in March but did look at the PDF copy provided. I would have installed a system years ago if the pay back rate had been more favourable to me, or if I had had access to the upfront costs to do the installation.

344.	Solar generation is a zero carbon emitter, unlike coal or petroleum generator. therefor this should be embraced and encouraged at all times. hence we strongly support a one for one purchase policy. Solar generation is the clean one, we should not be penalized for the investment we did in trying to keep our Planet Green and cut down on the carbon problem that is directly responsible for CLIMATE CHANGE. we should be credited one for one and certainly not penalized in any way but encouraged.
345.	Homeowners, after 'upfront' purchase of alternate infrastructure, should be able to profit from the benefits of their purchase. BC's proposed 23 year payback period is not very motivating. In Alberta, the government provides up to $10,000 or 35% off system installation, plus some Cities provide additional incentives. In the US, the federal government provides a reduction of 30% on installation. In BC, we have no incentives and it appears that BC Hydro would like us to be content that in 23 years we have recovered the initial outlay and we can anticipate JUST covering the cost of our future usage. Owners of alternate energy infrastructure should be allowed to profit after recouping initial costs. As a taxpayer investing in my own energy infrastructure, AS WELL AS BC Hydro projects, I should retain any additional load profits from my energy source.
346.	I agree with the issue noted in your survey that the current limitation of generation not being greater than load does not accommodate addition of electric vehicles (we already own one EV, and plan to replace our second vehicle with an EV or PHEV). We also own a recreational property in a remote location with some local hydro and PV power generation (no power yet supplied by BC Hydro). Once this property is connected to BC Hydro, net metering would certainly be beneficial. However, while the power from this system is reasonably predictable, it's usage by a mixture of permanent and recreational lot owners is highly variable, making an annual load calculation difficult, again especially as more lot owners transition to using EVs, and as more local generation is installed. I implore BC Hydro to continue to encourage innovation in distributed power generation by making the net metering program attractive and appropriately rewarding for those who can contribute to load balancing and generation.
347.	Find a way to include community solar installations in net metering. If an installation is less than average annual residential use (11,000Kwh), do applications need the same level of stringent review by BCH - ease the way for new entries to net metering.

348.	BC Hydro should allow and welcome distributed generation - it provides local energy security, takes pressure of the transmission system, increases the efficiency of long-distance transmission by decreasing local loads, saves BC Hydro and its customers money because of decreased urgency to expand the transmission system as overall demand increases and capital expenditures, including upgrades and O&M are carried by net-metered customers. The electricity fed into the grid needs to be valued properly and not seen as competition in the current central generation model. BC Hydro incurs hardly any cost for transmission and distribution for customer-generated electricity. The Net metering program needs to be much more flexible and allow community net metering (essential for communities, strata, rental buildings, etc). Currently BC Citizens living in houses shaded by trees or other buildings do not have any option to take part in solar generation. BC Hydro could decrease the amount of administrative cost by automatically accepting any solar generator size up to 10 kW: its annual production (11000 kWh) equals the average annual demand of BC households. Average demand will increase as EVs, heat-pumps and other GHG-saving devices are adopted, thus easily exceeding current average demand. Seasonal overproduction by net metering customers should not be seen as a negative in a system, like in BC, dominated by hydro-electricity, with abundant storage capacity. Taking the long view, limited overproduction should be encouraged and not discouraged. BC Hydro should seriously consider a separate and streamlined net metering programme for solar. It does not make much sense to group generation with capacity factors differing by a factor of four into the same programme. In addition, scale, cost, maintenance, ease of installation and speed of installation all make solar a prime target for a simplified and truly customer-friendly net metering programme. BC Hydro predicts that electricity demand will increase in the future: by encouraging solar generation, welcoming distributed generation, allowing controlled overproduction and allowing community net metering, it is possible to cover the increased demand with minimal capital expenditures to tax and ratepayers. Small incentives, similar to those available to Canadians in many other provinces, would go a long way to coping with the anticipated increases in demand.
349.	we should have more solar panels on Vancouver Island
350.	I strongly object to some of the questions that only offer 2 choices in this survey. It appears very biased against people who put into the grid. You should have limited generation in the first place , say 5kw! In retrospect I would have gone with a stand alone system. I have been betrayed. I was not out to make alot of money on my 2.3kw system but I did expect to make my money back in a

	reasonable time.
351.	BC Hydro consultation with Stakeholders on the net metering program. Clean Energy BC is responding to requests for feedback from the recent webinars on the net metering program. We see two clearly distinct categories to comment on:- 1) Existing net metering customers 2) Future applicants Existing net metering customers. Existing customers entered a scheme with the following characteristics, quoted directly from the BC Hydro website:- “Our net metering program is designed for those who generate electricity for their own use. When you generate more than you need, you sell it to us. When you don't generate enough to meet your needs, you buy it from us. When you sell to us, you get a bill credit towards your future electricity use. If you still have an excess credit at your anniversary date of joining the program, we'll pay you for the electricity at the rate of 9.99 cents per kilowatt hour (kWh). It's that simple.” https://www.bchydro.com/work-with-us/selling-clean-energy/net-metering.html?WT.mc_id=rd_netmetering It is slightly more complicated than that for applicants who want to put more than 27kw facilities onto the grid, indeed you refer to them as “complex net metering”. These applicants will have gone through additional scrutiny in the process, including a more complicated application process, an actual “acceptance” of the application by BC Hydro and then a longer interconnection process, testing and connection to the grid. None of them will have been a surprise to BC Hydro as they went through a pre-approval process before “accepting” the project. The problem we see is that BC Hydro now wants to change the parameters of the scheme. To be clear, we have no issues with BC Hydro changing the parameters for future applicants, but these existing applicants (who are not members of CEBC) entered into a program and, relative to their financial position, made substantial financial commitments based on a set of rules published by Hydro. The offer to purchase excess power at 9.99c kwh was a material and substantial part of any one applicants decision to enter the scheme. The webinar suggests that Hydro is upset that five customers are selling large amounts of power back to the grid. A rough calculation makes it less than one quarter of one MW of 24/7 production, or approximately 1/15th of

	1% of Site C's proposed production, so "large" needs to be taken with a pinch of salt. **The message is that the five customers, out of over 1,300 customers, are not living up to the intent of the scheme. If the size of these projects is an issue, the time to take this up was at the application stage when the projects were being reviewed. At this stage the applicants could have been appraised of the "intent" of the scheme and could have made any decisions based on those facts. However, the applications were approved, they were given the go ahead to connect to the grid and fully expected to collect payment for their excess generation at 9.99c kwh. Remember, BC Hydro specifically approved each of the five projects as they are over 27kw.** **The issue with someone saying that the proponents are not matching the intent of the scheme is simple. When someone reads a set of rules, you cannot imagine the intent of the scheme. You can read the rules and abide by the rules, the intent is open to being ambiguous and prone to re-interpretation as time goes on. If you read the rules at a time when BC Hydro is going through procurement, such as the 2008-16 window, you would assume that the intent was to move production to individual customers on a distributed basis and, as clearly stated, buy any excess power. That would appear to have been the intent at that time. It can now be interpreted that the scheme's "intent" is being re-written so that applicants were meant to only produce as much power as they needed and no more. The fact that the intent can be interpreted different ways in different scenarios means it is not a reliable test, but the rules are the rules. Let's be honest, the graphic for net metering on the BC Hydro website mentions three words. Generate. Use. Sale. Six sentences are your pitch for the program:-** **Our net metering program is designed for those who generate electricity for their own use. When you generate more than you need, you sell it to us. When you don't generate enough to meet your needs, you buy it from us.** **When you sell to us, you get a bill credit towards your future electricity use. If you still have an excess credit at your anniversary date of joining the program, we'll pay you for the electricity at the rate of 9.99 cents per kilowatt hour (kWh). It's that simple.** **That is what you have sold people. That is what they have bought. You need to decide what sort of moral character your corporation has. These five applicants have an immaterial impact on the rate base – less than the smallest coin in the realm per customer per year, yet changing the rules in retrospect could have a devastating impact on the proponents that were approved by you.** **Existing projects were built on the back of a promised payout. You should honour that. If you have five projects that you feel are producing too much power for your needs, then perhaps consider making a one off capital payment to the project owners to scale back production. If you want them to halve their production, pay them half of the cost to build their project with a margin for the**

	disproportionate maintenance and operating costs that will arise. The error does not lie with the proponents, the error here is that BC Hydro did not consider the impacts of "larger projects" that meet all of the rules, when their priorities have moved from acquisition to excess. But also, really, we are in a temporary excess period as CleanBC is moving the province towards a period of large scale mass electrification. **Future net metering.** **We see two different markets evolving here. The residential market and the commercial market.** **Residential market.** **The question is what is the purpose of a net metering scheme? Is it designed to encourage the use of renewables, to promote distributed power, to reduce GHG emissions? If a proponent has to balance the power produced with historical demand, how do they balance out future anticipated switches from natural gas for heating and cooking to electric, from petroleum or diesel vehicles to electric cars etc.** **Canada is following the global trend of trying to move all housing to "net zero" energy consumption. It is "net" not "no" energy. The implication could be that a vast number of residential properties will have renewables built into their very fabric, whether it be solar panels on roofs or even solar windows that produce power. There are huge plus sides to this on site power generation, including a reduction in the need for BC to spend large amounts of capital to dramatically upgrade its grid to meet our future electrification requirements. What if net metering was tied to distributed storage as well? What if the program was designed to encourage proponents to shift their time of usage so that they self generate during the day with solar, as an example, store excess power in on site batteries for peak hours and then top up their own systems in off peak times if forecasted generation is low? Can we use it as a smarter tool to meet our climate goals?** **Broadly speaking, one third of BC Hydro's power sales are to the residential market. At its most extreme, the net zero concept would remove a large number, if not all, residential customers from the need to buy power from the grid. But the grid can provide more than just power sales. It provides certainty, it provides backup, it provides access to sources of power outside ones own internal systems, We all know systems need maintenance and repairs and can fail. Net zero houses are effectively net metering houses. Should we consider a change to the system where any net zero house that connects to the grid pays a charge for the standby services available? Is it more complex than just power in offsetting power out? Perhaps this needs exploring in more detail.** **Commercial Market** **What is the driver for larger scale net metering projects – and what is the real**

	difference between net metering and behind the meter projects? Is it simply that a behind the meter project never provides power to the grid in exchange for offsets or money? That net metering is capped at 100kw whereas behind the meter is whatever someone chooses to have? What happens if commercial operations complete retro-fits and become more efficient? I would use a cannabis company as an example – if they start production with traditional lighting but move to LED later, they might reduce consumption by 75-90% as both lighting costs and HVAC costs reduce dramatically. I think the global forecast is that the future trend will be towards an increase in distributed power provided by users. The question is whether you want to work with net metering to promote or hinder this. A utility that embraces the future changes will probably do better than one that tries to put up fences to protect its system. The past has been about providing 100% of customer power through reliable production and distribution of electricity. The future will become more about providing ancillary services to back up customers own generation in a way that still preserves the financial integrity of the utility. Jump forwards twenty to thirty years and the market will be distributed power, often self generated, with distributed storage and services provided from the central utility. This is much like the jump that happened in computing 30 years ago. Everyone was on dumb terminals linked to the central mainframe, then distributed computing arrived, then mobile computing and then cloud computing. Electricity is going to find its own new world as well. What if we look at commercial customers differently. What if we start with the assumption that no one really knows what their power requirements will be in 3, 5 or 10 years, which makes matching self generation and load tricky. For perspective on timelines, remember, smart phones have only existed 11 years, they have changed the way we live and work. They are not the end of development, just a phase. You can't create a future distributed system that could create liabilities for you, especially on a large scale. You enter into a net metering arrangement on the assumption that the position will net zero, but what if it was a pulp and paper company that went bust and you suddenly have an inflow of power with no matching outflow? It is not the same as entering an EPA where you buy power because you want certainty of power. This is a random event that could force power on you whether you want it or not and you are now paying for this indefinitely. I think the commercial side should accept that at best they will trade power with you – a real net position. You could tweak the system to provide incentives for the inflow of power to be when it is advantageous for you – peak demand periods for instance. You could also tweak it so that there are supply advantages to you as well – providing power to proponents storage systems at night when demand is low. The Californian system was initially a "take it when on offer" system, which led

	to the duck curve issue. This in turn is leading to all sorts of clever storage solutions to shift the supply to when demand requires the power. You can learn from this experience and leap frog the learning curve with a system that is designed to work for you rather than against you. This is where the intelligent utility will go. **Summary of future opportunities.** **Recognise the world is changing and the changes could be rapid. BC has a net zero residential target for 2032. Properties are being built already that are net-zero and beyond (ie Golden has a plus 40% project being built at the moment at lower costs than traditional building – economics will accelerate this change. The developer will argue the plus 40% factors in EV charging, how do you deal with this?). Proactively consider the broader picture. Consider that net zero buildings will be less base load and more variable demand, so consider changing the rate plan to accommodate the fact that you are providing balancing/support/emergency services instead of flat power. This is potentially a dramatic change, and either a threat if not foreseen, or an opportunity to become the core support for the changes in the province. But the old fashioned net metering concept will disappear.** **On the commercial side we think you should consider dramatically revamping the program to shape the demand side. Accept that behind the meter, whether called net metering or not, is going to increase. So incentivize it to fit your requirements. Accept that base load power might cease to be your bread and butter and focus on grid services that require power to support them. Scrap the idea of payments to commercial customers, decide whether you want to just call it behind the meter projects or whether you want to trade power. With smart meters you should be able to decide whether that is a 1 for 1 trade, or a variable trade based on peak and off peak transfer of powers in either direction. If the parameters could change over a period of time, state that up front so that proponents are warned of possible fluctuations in calculations. If it is behind the meter the system size is decided by the customer, if you are trading power on a net basis you can limit it to a net basis so no cash payouts, but you should really let the customer size the system to their needs, not yours. That is generally how customer relationships work, what does the customer want, what helps them meet their objectives and how do you fit into that picture?** **The old net metering scheme was designed for the quirky individual who thought they could do things differently. The problem is that mindset is going to become mainstream and it will happen fast. The cost of utility scale solar and wind projects has dropped massively, so people are seeing headlines all the time where power is being sold at a fraction of the price they are paying BC Hydro. The problem for BC Hydro is that a lot of the behind the meter solutions are becoming plug and play. No hassle, little if any maintenance, and quick pay back times. That is why you need to find a way to tie them into the BC Hydro support services so that you are a core part of the solution.**

	We think the current review is just trying to tweak an already outdated system. Draw a line under the past proponents and have some interactive workshops on possible rate designs for the future. We would be fully supportive of an application to the BCUC requesting an extension in time to review this in more detail and are more than willing to engage on discussions about design for the future.
352.	**1- To ease adoption of solar and reduce red tape, solar systems up to 10 kW should not require review by BC Hydro.** **2- BC Hydro needs to join the rest of the world and allow and encourage virtual net metering, an essential tool for renters, strata, communities etc. to join zero-carbon initiatives. Current net metering rules do not allow community solar.** **3- Statements by BC Hydro that net metering customers drive up rates for non-participants is based on one side, and flawed analysis. In fact, net metering customers save the corporation money by a)reducing the cost of transmission, b)increasing transmission efficiency, c)contributing to energy security and d)delaying (or obviating) investment in future generation capacity (if needed), since capital costs are carried by net metered customers and do not have to be borne by non-participants.** **4- Taking the long view, overproduction by willing net metered customers should be encouraged, provided that a fair price can be negotiated.**

22.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Engagement Survey Results
Exhibit B-1, Appendix E, pp. 12-13

On pages 12 and 13 of Appendix E to the Application BC Hydro states it received 352 additional comments in response to the proposed changes to the Net Metering program. Further to that customers and stakeholders also provided feedback through written submissions.

1.22.2 Please provide a copy of the written submissions received during the Engagement Survey.

RESPONSE:

Attachment 1 to this response provides a copy of the five written submissions BC Hydro received during the Engagement Survey.

Written submissions were received from the Canadian Solar Industries Association, Clean Energy BC and three individuals. BC Hydro has redacted portions of the public version of the attachment to protect the personal contact information of the individuals.

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Response to BC Hydro Amendments to Net Metering Service

On March 18, 2019 BC Hydro hosted a webinar on proposed changes to the **Net Metering program**. **View the webinar's presentation** [PDF, 253 KB].

BC Hydro is proposing changes to the Net Metering program and will be filing an application to the BCUC by April 30, 2019. To help inform the application, CanSIA has prepared responses to the topics under consideration. These topics include annual excess energy, right sized applications, the anniversary date, the true-up period and grandfathering. It is important to note that Net Metering participants who right sized their system properly will not be affected by the proposed changes.

For an explanation of the topics, please see document NEM-INTRO

All new applications to the NEM Program will have an equal load-to-generation ratio, ensuring no individual excess generation facilities will be put in place. This is will significantly decrease opportunities for large payouts to customers. This change is a direct response to excess generation facilities misusing and draining program resources.

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TOPIC 1: EXCESS ENERGY PRICE

Price for excess energy should reflect its value to BC Hydro's system

1. *Revise the price for excess energy to reflect the price BC Hydro could sell the electricity for on the regional market, or*
2. *Allow customers to bank their credits for a five year period, after which credits expire*

Annual excess energy should not be confused with the credits you earn and use during your regular billing cycle. The credits you earn during billing periods with excess will be used up in subsequent billing periods when they are needed. The annual excess payouts are a non-issue when coupled with right sizing, anniversary date and an extension of the true-up period. In the event that you don't use all of your credits through the true-up period, then BC Hydro needs a way to settle the account.

BC Hydro's proposal suggests payouts for annual excess energy should be at the market rate of approximately 3-4 cents/kWh. Currently, the annual excess rate is linked to the previous Standing Offer Program rate of 9.99 cents/kWh.

Customers who currently overproduce, or a future customer that would like to share energy with a group may find issue with this. To accommodate, BC Hydro must approach the amendments methodically, allow flexibility for current participants and exhibit an encouraging approach for the future.

Recommendation:

When coupled with the recommended right sizing, anniversary date and true-up period changes, it is suggested that the market price be used as the method to settle any excess energy.

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TOPIC 2: INTERIM SOLUTION TO ADDRESS OVERSIZED GENERATION
Interim Solution to Limit Excess Generation had Unintended Consequences

1. *Keep interim solution with greater flexibility, or*
2. *No load-to-generation ratio (dependent on other program changes)*

The interim process is to evaluate a customer's load and ensure it is greater than the estimated generation of the proposed installation. This is time consuming and difficult to assess for new construction or additional future loads.

Recommendation:

When coupled with the recommended anniversary date and true-up period changes, it is suggested there would be no load to generation ratio required. Otherwise the load to generation ration should only apply to systems above 8kW. Customers should be allowed to submit future load estimates for new construction or additional loads being added.

To reallocate administration resources, the automatic approval limit needs to increase from 5kW to 8kW. This aligns much closer with the average household's typical consumption and electrical service size. A 5kW system generates less than half of the average household kWh per year while an 8kW system generates closer to 70% of the consumption. An 8kW system is still low enough to ensure no homes will over generate while streamlining the application process and encouraging homeowners to implement an average sized system.

Average Household Consumption (kWh)

900kWh/month x 12 months = 10 800 kWh/year

Generation Per Year (5kW)

5kW x 365 x 24 x 0.1 = 4 380k Wh/year

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Generation Per Year (8kW)

8kW x 365 x 24 x 0.1 = 7 008 kWh/year

It is crucial to continue to allow applicants that do not meet the auto limit or have adequate consumption history to submit an anticipated consumption report with their application. As the popularity of electric vehicles (EV's) rises across BC, many homeowners are looking to implement solar on their homes to offset the load required to charge, approximately 3 500kWh per year. This is a critical part of strengthening Net Metering alongside established government goals. Based on the deadlines set by the BC Government, all new vehicles in 2040 must be zero-emission vehicles (ZEV's). Therefore, it has become imperative for BC Hydro to conduct the NEM program in a way that supports zero emission goals and incentivizes homeowners to reach them as well. Increasing the expected oversize allowance to 35% would ensure that new homeowners could supplement both their home and their vehicle with comfort. – If BC Hydro is not going to set an expected oversize limit then the 35% may not be important, maybe it would be more effective to set specific rules for EV's so that oversizing for an EV is automatically approved.

Again, when coupled with the recommended anniversary date and true-up period changes, it is suggested there would be no load to generation ratio required.

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TOPIC 3A: REVISE PAYMENT TERMS – ANNIVERSARY DATE

Allowing customers to choose their anniversary date could provide increased opportunities to offset consumption

1. *Set common anniversary date for all customers (eg. March 1st); or*
2. *Allow customers to choose their anniversary date 1 time*

Currently the anniversary date is set when the installation is connected (in service date). Since most of the installations are connected in the summer, most anniversary dates are in the summer or fall. This is the least desired date for a PV system. As the majority of credits are generated in the summer months, the customer should be given the opportunity to utilize those through the winter.

Recommendation:

The customer should be given the option to specify an anniversary date on their application or be given the default of March 1st. A default date ensures existing customers who have not made chosen a date utilize their net metering system at maximum profitability. To support customer choice, BC Hydro should provide educational materials about the benefits and negatives of where the anniversary date lies, guaranteeing participants choosing their net metering date to make an effective decision.

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TOPIC 3B: REVISE PAYMENT TERMS – TRUE UP PERIOD

Modifications to the true up period could provide customers with increased opportunities to offset their consumption

1. *Retain current true-up period; or*
2. *Extend true-up period from current 12 months to 24 months or longer*

For equivalent reasons why a change in anniversary date is important, the true-up period is most valuable when credits built up over the summer can be applied in the winter. The current true-up term of 12 months would mean the customer would not be able to carry any credits past their anniversary date. The issue arises when a customer's consumption drops one year and then picks back up the next, the customer would lose the opportunity to use their credits.

Recommendation:

Coupled with the recommended anniversary date and to align with other jurisdictions across Canada, such as Saskatchewan, the true-up period should extend to 36 months. This effectively allows multiple years worth of electric bills to be covered and give the customer the ability to adapt to annual changes. An example would be the driving distance of their electric vehicle varies from year to year.

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TOPIC 4: GRANDFATHERING

The proposed changes discussed in topics 1-3 may have different impacts depending on customer type

1. *Grandfathering existing customers for a period up to 5 years and commit to reviewing the grandfathering provision after the selected term expires*

Grandfathering will only affect those customers that generate a significant amount of annual access energy (generating credits in the summer and not using them up in the winter). There are only a handful of customers that currently have systems big enough to generate more annual energy than they consume. In fact, 80% of net metering customers do not generate enough power to receive annual payouts

Recommendation:

Customers whose load-to-generation ratio meets the current criteria will not be affected if the anniversary date and true-up period are set to the recommended March 1st and 36 months respectively. Thus, there would be no need to grandfather those customers.

The few customers that are not right sized should be given a five-year duration to operate under the current program. During this time, those producers will be able to function under the existing Net Metering program rules and excess energy prices. BC Hydro will see a decrease in excess generation facilities simply by a change in anniversary date, especially important for the 98% of NEM customers who utilize PV. The five-year tern would be used to explore the option of a Virtual/Community Net Metering Program (VNM).

After the term is complete, the customers who are still generating in large excess should pilot a VNM program, or accept payout at the market rate. As a reverberation, BC Hydro allows adequate time for a transition period to occur and uses excess generation facilities as ideal candidates to introduce Community Solar.

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VNM refers to an alternative for homeowners who do not want to have their own personal PV system or do not qualify to, such as in the case of an apartment complex. Each system takes aggregate bills from a number of participants and utilizes one shared project between the subscribers to offset each personal electric bill. The adoption of this program is limited by sizing, capital and regulatory restrictions. While there are costs associated with these changes, they can be consolidated as a flat monthly fee to each participant of VNM.

BC Hydro Consultation with Stakeholders on the Net-Metering Program

Clean Energy BC is responding to requests for feedback from the recent webinars on the net metering program.

We see two clearly distinct categories to comment on:

1) Existing net metering customers
2) Future applicants

Existing net-metering customers

Existing customers entered a scheme with the following characteristics, quoted directly from the BC Hydro website:

"Our net metering program is designed for those who generate electricity for their own use. When you generate more than you need, you sell it to us. When you don't generate enough to meet your needs, you buy it from us.

When you sell to us, you get a bill credit towards your future electricity use. If you still have an excess credit at your anniversary date of joining the program, we'll pay you for the electricity at the rate of 9.99 cents per kilowatt hour (kWh). It's that simple."

https://www.bchydro.com/work-with-us/selling-clean-energy/net-metering.html?WT.mc_id=rd_netmetering

It is slightly more complicated than that for applicants who want to put more than 27kw facilities onto the grid, indeed you refer to them as "complex net metering." These applicants will have gone through additional scrutiny in the process, including a more complicated application process, an actual "acceptance" of the application by BC Hydro and then a longer interconnection process, testing and connection to the grid. None of them will have been a surprise to BC Hydro as they went through a pre-approval process before "accepting" the project.

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The message is that the five customers, out of over 1,300 customers, are not living up to the intent of the scheme. If the size of these projects is an issue, the time to take this up was at the application stage when the projects were being reviewed. At this stage the applicants could have been appraised of the "intent" of the scheme and could have made any decisions based on those facts. However, the applications were approved, they were given the go ahead to connect to the grid and fully expected to collect payment for their excess generation at 9.99c kwh. Remember, BC Hydro specifically approved each of the five projects as they are over 27kw.

The issue with someone saying that the proponents are not matching the intent of the scheme is simple. When someone reads a set of rules, you cannot imagine the intent of the scheme. You can read the rules and abide by the rules, the intent is open to being ambiguous and prone to re-interpretation as time goes on. If you read the rules at a time when BC Hydro is going through procurement, such as the 2008-16 window, you would assume that the intent was to move production to individual customers on a distributed basis and, as clearly stated, buy any excess power. That would appear to have been the intent at that time. It can now be interpreted that the scheme's "intent" is being re-written so that applicants were meant to only produce as much power as they needed and no more. The fact that the intent can be interpreted different ways in different scenarios means it is not a reliable test, but the rules are the rules. Let's be honest, the graphic for net metering on the BC Hydro website mentions three words. Generate. Use. Sale. Six sentences are your pitch for the program:

"Our net metering program is designed for those who generate electricity for their own use. When you generate more than you need, you sell it to us. When you don't generate enough to meet your needs, you buy it from us."

"When you sell to us, you get a bill credit towards your future electricity use. If you still have an excess credit at your anniversary date of joining the program, we'll pay you for the electricity at the rate of 9.99 cents per kilowatt hour (kWh). It's that simple."

That is what you have sold people. That is what they have bought. You need to decide what sort of moral character your corporation has. These five applicants have an immaterial impact on the rate base – less than the smallest coin in the realm per customer per year; yet changing the rules in retrospect could have a devastating impact on the proponents that were approved by you.

Existing projects were built on the back of a promised payout. You should honour that. If you have five projects that you feel are producing too much power for your needs, then perhaps consider making a one-off capital payment to the project owners to scale back production. If you want them to halve their production, pay them half of the cost to build their project with a margin for the disproportionate maintenance and operating costs that will arise. The error does not lie with the proponents, the error here is that BC Hydro did not consider the impacts of "larger projects" that meet all of the rules, when their priorities have moved from acquisition to excess. But also, really, we are in a temporary excess period as CleanBC is moving the province towards a period of large-scale mass electrification.

Future Net-Metering

We see two different markets evolving here. The residential market and the commercial market.

Residential market

The question is what is the purpose of a net metering scheme? Is it designed to encourage the use of renewables, to promote distributed power, to reduce GHG emissions? If a proponent has to balance the power produced with historical demand, how do they balance out future anticipated switches from natural gas for heating and cooking to electric, from petroleum or diesel vehicles to electric cars etc.?

Canada is following the global trend of trying to move all housing to “net zero” energy consumption. It is “net” not “no” energy. The implication could be that a vast number of residential properties will have renewables built into their very fabric, whether it be solar panels on roofs or even solar windows that produce power. There are huge plus sides to this on-site power generation, including a reduction in the need for BC to spend large amounts of capital to dramatically upgrade its grid to meet our future electrification requirements. What if net metering was tied to distributed storage as well? What if the program was designed to encourage proponents to shift their time of usage so that they self-generate during the day with solar, as an example, store excess power in on site batteries for peak hours and then top up their own systems in off peak times if forecasted generation is low? Can we use it as a smarter tool to meet our climate goals?

Broadly speaking, one third of BC Hydro’s power sales are to the residential market. At its most extreme, the net zero concept would remove a large number, if not all, residential customers from the need to buy power from the grid. But the grid can provide more than just power sales. It provides certainty, it provides backup, it provides access to sources of power outside one’s own internal systems. We all know systems need maintenance and repairs and can fail. Net zero houses are effectively net metering houses. Should we consider a change to the system where any net zero house that connects to the grid pays a charge for the standby services available? Is it more complex than just power in offsetting power out? Perhaps this needs exploring in more detail.

Commercial Market

What is the driver for larger scale net metering projects – and what is the real difference between net metering and behind the meter projects? Is it simply that a behind the meter project never provides power to the grid in exchange for offsets or money? That net metering is capped at 100kw whereas behind the meter is whatever someone chooses to have?

What happens if commercial operations complete retro-fits and become more efficient? I would use a cannabis company as an example – if they start production with traditional lighting but move to LED later, they might reduce consumption by 75-90% as both lighting costs and HVAC costs reduce dramatically.

I think the global forecast is that the future trend will be towards an increase in distributed power provided by users. The question is whether you want to work with net metering to promote or hinder this. A utility that embraces the future changes will probably do better than one that tries to put up fences to protect its system. The past has been about providing 100% of customer power through reliable production and distribution of electricity. The future will become more about providing ancillary services to back up customers own generation in a way that still preserves the financial integrity of the utility. Jump forwards twenty to thirty years and the market will be distributed power, often self-generated, with distributed storage and services provided from the central utility. This is much like the jump that happened in computing 30 years ago. Everyone was on dumb terminals linked to the central mainframe, then distributed computing arrived, then mobile computing and then cloud computing. Electricity is going to find its own new world as well.

What if we look at commercial customers differently? What if we start with the assumption that no one really knows what their power requirements will be in 3, 5 or 10 years, which makes matching self-generation and load tricky? For perspective on timelines, remember, smart phones have only existed 11 years, they have changed the way we live and work. They are not the end of development, just a phase.

You can't create a future distributed system that could create liabilities for you, especially on a large scale. You enter into a net metering arrangement on the assumption that the position will net zero, but what if it was a pulp and paper company that went bust and you suddenly have an inflow of power with no matching outflow? It is not the same as entering an EPA where you buy power because you want certainty of power. This is a random event that could force power on you whether you want it or not and you are now paying for this indefinitely. I think the commercial side should accept that at best they will trade power with you – a real net position. You could tweak the system to provide incentives for the inflow of power to be when it is advantageous for you – peak demand periods for instance. You could also tweak it so that there are supply advantages to you as well – providing power to proponents' storage systems at night when demand is low.

The Californian system was initially a "take it when on offer" system, which led to the duck curve issue. This in turn is leading to all sorts of clever storage solutions to shift the supply to when demand requires the power. You can learn from this experience and leap frog the learning curve with a system that is designed to work for you rather than against you. This is where the intelligent utility will go.

Summary of Future Opportunities

Recognize the world is changing and the changes could be rapid. BC has a net zero residential target for 2032. Properties are being built already that are net-zero and beyond (i.e. Golden has a plus 40% project being built at the moment at lower costs than traditional building – economics will accelerate this change. The developer will argue the plus 40% factors in EV charging, how do you deal with this?). Proactively consider the broader picture. Consider that net zero buildings will be less base load and more variable demand, so consider changing the rate plan to accommodate the fact that you are providing balancing/support/emergency services instead of flat power. This is potentially a dramatic change, and either a threat if not foreseen, or an opportunity to become the core support for the changes in the province. But the old-fashioned net metering concept will disappear.

On the commercial side we think you should consider dramatically revamping the program to shape the demand side. Accept that behind the meter, whether called net metering or not, is going to increase. So incentivize it to fit your requirements. Accept that base load power might cease to be your bread and butter and focus on grid services that require power to support them. Scrap the idea of payments to commercial customers, decide whether you want to just call it behind the meter projects or whether you want to trade power. With smart meters you should be able to decide whether that is a 1 for 1 trade, or a variable trade based on peak and off peak transfer of powers in either direction. If the parameters could change over a period of time, state that up front so that proponents are warned of possible fluctuations in calculations. If it is behind the meter the system size is decided by the customer, if you are trading power on a net basis you can limit it to a net basis so no cash payouts, but you should really let the customer size the system to their needs, not yours. That is generally how customer relationships work, what does the customer want, what helps them meet their objectives and how do you fit into that picture?

The old net metering scheme was designed for the quirky individual who thought they could do things differently. The problem is that mindset is going to become mainstream and it will happen fast. The cost of utility scale solar and wind projects has dropped massively, so people are seeing headlines all the time where power is being sold at a fraction of the price they are paying BC Hydro. The problem for BC Hydro is that a lot of the behind the meter solutions are becoming plug and play. No hassle, little if any maintenance, and quick pay back times. That is why you need to find a way to tie them into the BC Hydro support services so that you are a core part of the solution.

We think the current review is just trying to tweak an already outdated system. Draw a line under the past proponents and have some interactive workshops on possible rate designs for the future. We would be fully supportive of an application to the BCUC requesting an extension in time to review this in more detail and are more than willing to engage on discussions about design for the future.

BC Hydro.
Net metering program review.
Feedback to April 2019 consultation

BACKGROUND

BC Hydro review objectives:

- allows customers to generate their own electricity to reduce their supply from BC Hydro;
- provides a safe process to connect to BC Hydro's system;
- is fair to participating and non-participating customers; and
- offers an accessible and streamlined process for participation.

Netmetering last year rules change:

- Require customers to size their generation to match their load requirements
- Aligns with the intent of providing an opportunity for customers to offset their own load

BC Hydro main concern:

- Big cash payout with large share going to 5 customers only (all run-of-the-river Hydro).

Objectives of the proposed new changes:

- Maintain the Net Metering program as a **load offset** program
- Provide customers with increased opportunities to **offset their load**
- Review the price for excess energy to reflect the regional wholesale electricity market
- Update the tariff to reflect existing program practices
- Improve **fairness** between participating and non-participating customers

98% of current Netmetering installation are Solar

PROPOSAL

Considering that:

- The purpose of the Netmetering program is **load displacement**.
- BC Hydro is concerned by **cash** payment for excess electricity.
- BC Hydro sees no benefit for excess electricity but still has a need to reduce load and DSM (PowerSmart).
- BC Hydro wants to **streamline** the program.

The most logical and simple solution is to implement a *'use it or lose it'* rule in future Netmetering contracts.
It means: **no payout for excess electricity.**

That would meet all BC Hydro objectives:

- Pure load displacement
- No cash payment.
- Easy to administer.

With no payment for excess electricity, the system becomes self-regulated. Oversized installations will be self-penalized by producing excess electricity for free.
The electricity transferred in and out the grid can still be measured by a smart-meter, allowing customers to bank their credits for 5 year period, after which credits expire. (one of the options proposed by BC Hydro)

This solution would significantly streamline the program administration and eliminate the need to evaluate the load-vs-generation balance on a case by case basis. The maximum system size does not have to be limited anymore by an administrative threshold, as currently100 KW, but by the technical capacity of the interconnection, the existing smart meter or the grid. It makes the program performance-based instead of being overly prescriptive.

No payout also eliminates the need for upper limit (currently 100 kW). It will allow larger commercial operations to participate to the program and also be able to offset their load if the grid system allows it (1 MW rooftop solar systems are not uncommon in the US - Ikea, Walmart, etc,…)

SUMMARY

The system proposed can be summarized in 4 points:

- No payout. *Use it or lose it.*
- 5 years to offset excess production.
- No lower threshold.
- No upper limit.

Michel de Spot

Westaff, Melissa EMPR:EX

From: Langille, Laurie [redacted]
Sent: Monday, April 1, 2019 3:20 PM
To: Minister, EMPR EMPR:EX
Subject: FW: Net Metering

Categories: BC Hydro

Not sure if this was intended for the Minister's office.

Laurie

-----Original Message-----
From: Christoph Dietzfelbinger [redacted]
Sent: Monday, April 1, 2019 2:35 PM
To: Net Metering <Net.Metering@bchydro.com>; Donaldson.MLA, Doug <Doug.Donaldson.MLA@leg.bc.ca>; Mungall.MLA, Michelle <Michelle.Mungall.MLA@leg.bc.ca>
Subject: Net Metering

Hello at BC Hydro,

I had to leave the webinar because the connection became so poor I could not follow anymore. I'll try to sum up what I have to say.

The presentation tries to determine its outcome by its framing. It says that the net metering program was never intended to be a supply program.
So what? If it turns out that BC residents can supply clean, reliable power to the grid at no cost to BC Hydro, that should be seen as a fortunate coincidence that should be built upon. Instead, BC Hydro is trying to stifle it.

The presentation postulates that non-participating BC Hydro customers are subsidizing those that invest in a production facility. BC Hydro should really not be making such an argument. All BC Hydro customers subsidize those IPP producers of Gordon Campbell's days who are paid a multiple of retail prices for their power, which BC Hydro does not need. Those 40 year contracts are not being discussed while net metering customers are supposed to accept that their meager credits will expire after five years.

BC Hydro ratepayers are also on the hook for Site C. Its power will cost at least $0.12 and probably more than $0.16/kWh to produce. BC Hydro gets my power for $0.099/kWh without building any facility, and I continue to pay for my connection. It would be a lot cheaper for all BC Hydro ratepayers if BC Hydro abandoned Site C and encouraged production of wind and solar power. In Alberta, wind power is being sold at $0.0375/ kWh, a quarter of Site C production costs.

If BC Hydro, as stated by Ms McKenna, is in a power surplus situation, why is it building Site C?

BC Hydro's arguments make no sense at all, but they are trotted out time and again.

Ms McKenna claimed that solar PV is produced at times when demand is low. This is not true. The famous duck curve is rising in the early afternoon when solar production is high. Solar panels can be oriented west to catch the later afternoon sun, offsetting the high consumption at that time. Solar production is ideally suited to filling demand from air conditioning.

BC Hydro has gigantic batteries in its dams. Someone suggested that BC Hydro respond to intermittent production, as of solar, by adjusting the flow from its dams and turbines. This is of course already happening in many jurisdictions with pumped hydro storage. BC Hydro has all this already built. The reply to the suggestion was, with respect, mumbo jumbo about what complicated formulas are used to adjust flow, and that something as sensible as suggested would be impossible. This is belied by practice in many, many jurisdictions who use their hydro for exactly that purpose.

In closing, permit me to express my disappointment in the outdated, monopolistic and centralistic thinking that informs BC Hydro's presentation. It is my suggestion to expand the net metering program, and to not let credits expire. I am owed $170 by BC Hydro, for power that I produced at no cost to BC Hydro or any other customer. BC Hydro is proposing to steal such power, and to then sell it into the grid.
More enlightened utilities and jurisdictions encourage the building of solar capacity by offering feed-in tariffs that make it economically viable to build such arrays. BC Hydro is going in the opposite direction. This is wrong headed and will cost the utility and its customers a lot of money in the middle and long term. Deploying misleading arguments does not enhance BC Hydro's credibility. It also wastes an opportunity to rethink and rebuild the grid.

Thank you for your consideration.

Sincerely,

Christoph Dietzfelbinger
IFMGA/ UIAGM Mountain Guide - Bear Mountaineering and the Burnie Glacier Chalet CAA Professional Member Box [redacted] tel.[redacted]/ cell [redacted]
[redacted] www.bearmountaineering.ca

March 25, 2019

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3
commission.secretary@bcuc.com

RE: BC Hydro – Net Metering program changes

To whom it may concern.

BC Hydro (BCH) is currently working on submitting an application to the BC Utilities Commission proposing changes to the net metering program. As net metering participants, we have serious concerns with their recommendations.

1. BC hydro is proposing to reduce the net metering KW to the residential use only. We have a BC Hydro approved and operating 100 kWh system. Copy of the approvals enclosed for your reference. Due to living in a rural area, which is 35 km away from the closest BC hydro substation, we contribute to correcting BC Hydro low voltage and imbalanced problems. We correct this by an average of 10 volts for the surrounding area.
2. BC hydro is proposing to lowering the price per kWh paid to net metering participants. *(currently $0.99).* Below is the BC Hydro rate schedule showing the fees charged to their customers. This shows that the rate charged to customers of BC Hydro is much greater than the rate paid to net metering program participants. The majority of cost to BCH customers is charged at step 2 rate of $0.1326. BC Hydro incurred no cost or fees for the building of participants' net metering projects nor incur any fees for annual and consistent maintenance. In addition to providing a clean renewable source of energy to the province, BC Hydro benefits financially from the program based on our findings and comments above. Furthermore, in order to build a project such as ours, a significant amount of money was invested, financing put in place, and countless hours of work in the planning, researching, consulting, building and maintaining the project.
3. BC Hydro is proposing to cease payment to net metering program participant for electricity produced in excess of their own needs in five years. This results in BCH receiving on the grid free electricity after the five-year anniversary while the cost of construction and maintaining the equipment would still be the burden of the net metering participants. Larger projects such as ours would still require maintenance costs and supervision after this five-year period and financing obtained for the construction would not come close to being repaid. The strict intertie regulations that BC Hydro requires for this type of project, is a substantial cost to the net metering participants which would not be recovered.
4. BC hydro is proposing to paying out excess energy production every two years rather than annually. This would put significant pressure financially on net metering participants and create cashflow issues. There are yearly costs incurred by net metering participants which seem to not be considered at all in the BCH proposal. Larger project like ours for instance incur yearly costs such as insurance, licenses, repair and maintenance, and interest on long term loans associated with the construction.

Below is a link to the BC Hydro Rate Schedule 1289 with effective date of April 20, 2018. The document lays out the reasons considered by the BCUC and BCH on calculating the rate of pay at $0.99. We do not agree with BC Hydro recommendations to decrease the net metering program rate. As existing net metering participants, and having entered into an agreement with BCH, we have serious concerns with the concept of changing the terms of an agreement following approval of projects. Given the economic environment, rather than decreasing the rates consideration should be given to increasing rates instead.

We would like to point out as well that through the application and construction process, we incurred significant added costs specifically to address and meet the BCH standards and requirements in connection to compatibility and interconnection with BCH.

We participated in the recent webinar hosted by BC Hydro. A subsequent survey was sent out to participants. This survey is extremely bias as it only gives options to choose between their recommendations and proposals. It doesn't take into consideration any of the participants actual ideas, or concerns, as well as it doesn't allow to communicate opposition to the proposed changes.

We trust that the BC Utilities Commission will consider what is best for BC residents and not allow BC Hydro to change the terms of existing agreements nor take advantage of rate payers, or of the net metering participants.

Please note, we would like to put our names forward as interveners for the BC Hydro, Net Metering consultation should it be needed.

We attached the following as evidence and supporting documents indicating our project was reviewed, and approved by BCH:

- Appendix F: Declaration of Compatibility (DoC) for 50kW hydro signed Dec 30, 2013
- Appendix F: Declaration of Compatibility (DoC) for 2nd 50kW hydro signed March 23, 2017
- Email from BCH Net Metering program, dated April 20, 2018 concerning changes to the program

Further correspondence, notes or documents can be provided if necessary.

BC Hydro Rate Schedule 1289, April 20, 2018:

https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/integrated-resource-plans/current-plan/schedule-1289-net-metering-service.pdf

Please do not hesitate to contact us if you have any questions concerning this letter.

Kind regards,

Valerie Gagnon and Andrew Gosse
[redacted]

Basic charge A small, daily charge that partially covers the fixed cost of services for things such as metering and billing.	$0.1956 per day.
Energy Charge	**Step 1** $0.0884 per kWh for first 1,350 kWh in an average two month billing period (22.1918 kWh per day). **Step 2** $0.1326 per kWh over the 1,350 Step 1 threshold.
Minimum Charge	$0.1956 per day. Equal to the Basic Charge.
Rate Rider The Rate Rider covers additional and unpredictable energy costs resulting from, for example, low water inflows or higher-than-forecast market prices.	5% Rate Rider applied to all charges before taxes and levies.

https://app.bchydro.com/accounts-billing/rates-energy-use/electricity-rates/residential-rates.html

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22.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Engagement Survey Results
Exhibit B-1, Appendix E, pp. 12-13

On pages 12 and 13 of Appendix E to the Application BC Hydro states it received 352 additional comments in response to the proposed changes to the Net Metering program. Further to that customers and stakeholders also provided feedback through written submissions.

1.22.3 Please discuss how BC Hydro has considered the comments and submissions received in preparation for the Application.

RESPONSE:

BC Hydro considered all comments and submissions received in response to the proposed changes to the Program. The comments and submissions are summarized on pages 12 to 15 of Appendix E of the Application. The following table explains how BC Hydro considered these comments and submissions.

Comment/Submission	How Comment/Submission Was Considered
Additional Comments (Engagement Survey)	
General opposition to any changes to the Program	**BC Hydro recognizes that some existing customers in the Program feel that the Program works well and should not be changed. However, BC Hydro does not believe that the Program should continue without any changes. In particular, changes are required to maintain the Program as a load offset program and to limit cost shifting between participating and non-participating customers.**
Provide incentives or rebates to encourage net metering and/or distributed generation	**Incentives or rebates are not within the scope of Rate Schedule 1289. BC Hydro provides incentives or rebates through its Demand-Side Management and Low Carbon Electrification programs in alignment with the respective goals of those programs.** **BC Hydro does not currently see a need to provide incentives or rebates to encourage net metering and/or distributed generation.**
Provide increased flexibility around the requirements for the size of a customer's Generating Facility	**As stated in BC Hydro's response to BCUC IR 1.20.4, BC Hydro asked for suggestions to provide additional flexibility with regards to the definition of Annual Load. After reviewing the suggestions received, BC Hydro decided to propose the additional amendments outlined in section 2.7 of the Application.**

Comment/Submission	How Comment/Submission Was Considered
Exempt Generating Facilities with a capacity limit below a certain threshold from the requirement to have an estimated Annual Energy Output no greater than 110% of Annual Load	**As outlined in section 2.7 of the Application, BC Hydro is proposing amendments that would exempt Generating Facilities with a capacity size of 5 kW or less from the requirement to have an estimated Annual Energy Output no greater than 110% of the customer's estimated Annual Load.**
Adopt rate design changes, such as time-of-use rates	**As explained in BC Hydro's response to BCSEA IR 1.50.1 in BC Hydro's Fiscal 2020 to Fiscal 2021 Revenue Requirements Application proceeding, BC Hydro's default Residential Inclining Block Rate is relatively complex and its Step 2 Energy Rate is no longer aligned with BC Hydro's cost of energy.** **A simpler default residential rate structure with pricing that is more reflective of BC Hydro's costs would better facilitate the introduction of optional rates, such as time-of-use rates. If optional rates are introduced with the current residential rate structure and pricing, there is a risk of cost shifting and upward rate pressure for customers who are unable to benefit from the optional rates.** **BC Hydro is examining opportunities to simplify our default residential rate and to introduce optional rates. BC Hydro will consult with customers and stakeholders on potential rate designs prior to submitting any application to the BCUC for approval.**
Support and encouragement for distributed generation resources	**BC Hydro supports distributed generation resources through the Net Metering Program.**
Opposition to any requirement regarding the size of a customer's Generating Facility	**As explained in BC Hydro's response to BCUC IR 1.5.3, BC Hydro believes that a size requirement is necessary maintain the Program as a load offset program and to prevent customers from installing an Oversized Generating Facility which would result in these customers selling energy to BC Hydro on a consistent basis, similar to an IPP.**
Opposition to updating the Energy Price	**BC Hydro believes that the value of excess generation delivered to BC Hydro by customers in the Program, as reflected by the Energy Price, should be based on the market value. For further discussion, please refer to BC Hydro's response to BCUC IR 1.10.2.**

Comment/Submission	How Comment/Submission Was Considered
Support for Virtual Net Metering	**As explained in section 7.2 of the Application, enabling customers to share credits through a virtual net metering setup would require significant modifications to our billing system. In the meantime, BC Hydro has suggested that one customer "own" the net metering installation and perform the administrative task of allocating credits between the participating customers.** **BC Hydro will consider potential additional measures regarding virtual net metering for future applications.**
Support for a transitional Energy Price for existing customers	**BC Hydro is proposing a transitional Energy Price for the next 5 years, as outlined in section 6 of the Application to mitigate the impact of the change in Energy Price to existing customers.**
Canadian Solar Industries Association Submission	
The Energy Price should be the market price and if this change is made, there should be no requirement with regards to the size of a customer's Generating Facility	**BC Hydro is proposing that the Energy Price reflect the market price, as outlined in section 4 of the Application.** **As explained in BC Hydro's response to BCUC IR 1.5.3, BC Hydro believes that a size requirement is necessary maintain the Program as a load offset program and to prevent customers from installing an Oversized Generating Facility which would result in these customers selling energy to BC Hydro on a consistent basis, similar to an IPP.**
If there are requirements with regards to the size of a customer's Generating Facility, Generating Facilities with a capacity size of 8 kW or less should be exempt and allowances should be made for anticipated future consumption, particularly with regards to electric vehicles	**BC Hydro is proposing that Generating Facilities with a capacity size of 5 kW or less be exempt from the size requirement, as outlined in section 2.7 of the Application.** **BC Hydro is also proposing amendments to allow Annual Load to be increased for anticipated future consumption from the purchase of new equipment, including electric vehicles, as explained further in section 2.7 of the Application.**
Customers should be able to choose their own Anniversary Date and BC Hydro should set an optimized default Anniversary Date of March 1	**BC Hydro is proposing amendments that reflect this suggestion, as outlined in section 3 of the Application.**

Comment/Submission	How Comment/Submission Was Considered
The period between Surplus Energy Payments should be extended to 36 months	**BC Hydro considered extending the period between Surplus Energy Payments but chose to maintain a period of 12 months between Surplus Energy Payments for the reasons discussed in BC Hydro's response to BCUC IR 1.8.5.**
A transitional Energy Price should be provided to customers with Oversized Generating Facilities for a period of 5 years, with a commitment to explore Virtual Net Metering	**BC Hydro is proposing a 5-year transitional Energy Price for existing customers, as outlined in section 6 of the Application.** **BC Hydro will consider potential additional measures to support virtual net metering for a future application.**
Clean Energy BC Submission	
The Energy Price was a "material and substantial" part of decisions by existing customers to enter the Program and should be maintained for existing customers	**As discussed in BC Hydro's response to BCUC IR 1.15.5, enrolment in the Net Metering Program does not entail any contractual agreement between BC Hydro and the customer that provides assurance on the cost recovery of capital investments by the customer or stability of the terms and conditions, including the Energy Price.** **As explained in BC Hydro's response to BCUC IR 1.15.6.1, BC Hydro believes that the implementation process for the proposed update to the Energy Price should consider the concerns of existing customers and balance those concerns against the objective of fairly allocating the benefits and costs of the Program between participating and non-participating customers.** **To mitigate impacts to existing customers, BC Hydro is proposing a 5-year transitional Energy Price, as outlined in section 6 of the Application.**
BC Hydro should explore a net zero concept for the residential market, the Program should be "dramatically revamped" for the commercial sector to "shape the demand side" by providing incentives that match BC Hydro's requirements; and the review of the Program is trying to "tweak an already outdated system" and the Application deadline should be extended to allow additional time for a more detailed review.	**As discussed in section 7 of the Application, BC Hydro limited the scope of the Application to allow for adequate engagement with stakeholders and customers on the topics in the Application while meeting the requirement to file the Application by April 30, 2019.** **BC Hydro will consider issues beyond the scope of the Application for a future application.**

Comment/Submission	How Comment/Submission Was Considered
Individual Submissions	
The Program should be designed as a "use it or lose it" system where customers are allowed to size their Generating Facilities as they wish, with a 5-year period to apply any excess generation against their consumption before the credits expire, with no Surplus Energy Payment	**As discussed in BC Hydro's response to BCUC IR 1.20.6, BC Hydro proposed allowing customers to bank their credits for 5 years, after which the credits would expire, as an option to improve fairness between participating and non-participating customers. The results of the Engagement Survey indicated that a slight majority (53%) of participants preferred the alternative of updating the Energy Price.**
General opposition to the proposed changes and suggestion that the Program be expanded	**BC Hydro recognizes that many existing customers in the Program feel that the Program works well and should not be changed. However, BC Hydro does not believe that the Program should continue without any changes. In particular, changes are required to maintain the Program as a load offset program and to limit cost shifting between participating and non-participating customers.** **The Program continues to grow, at a more significant rate in recent years, as outlined in section 1.5 of the Application. As the Program grows, it is necessary to periodically re-evaluate and amend the Program as conditions change.**

23.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Net Metering Evaluation Report No. 4
Exhibit B-1, Appendix F, p. 11
RS 1289 – Customer Data

In the summary of inquiries, BC Hydro states that between April 2013 and March 2016 it responded to 616 phone calls and 401 emails.

1.23.1 Please provide a summary of any Net Metering related complaints received between April 2013 to date, including the nature of these complaints.

RESPONSE:

From April 2013 to present, BC Hydro received approximately 12 formal customer complaints (i.e., a complaint where the customer contacted BC Hydro, the Government of B.C. or the BCUC with regards to the Program or with regards to Net Metering policy in general). Specifically, BC Hydro has received:

- **Five complaints regarding the terms and conditions of Rate Schedule 1289:**
  - **A customer expressed concerns with regards to BC Hydro rates and did not agree that they should pay the standard daily charge. BC Hydro explained that the basic charge cannot be waived. (2014)**
  - **A customer installed solar panels but was not credited for their generation. The customer wrote to Minister of Energy and Mines Bill Bennett. BC Hydro advised the Minister's office that we had no record of the customer and that some customers may install a Generating Facility on their premises without realizing that they are required to apply to the Program in order to accumulate a Generation Account Balance. (2015)**
  - **A customer installed solar panels without applying to the Program. The customer emailed the BCUC to complain that they were not credited for generation from the solar panels, but did not want to have a smart meter installed at their premises. BC Hydro advised that, in accordance with the terms and conditions of Rate Schedule 1289, a bi-directional meter (smart meter) is required for participation in the Program. (2015)**
  - **The same customer, mentioned in the bullet above, later wrote to Minister of Energy and Mines Bill Bennett to express their dissatisfaction with Rate Schedule 1289 and the requirements for participation in the Program. BC Hydro responded to clarify the application process and tariff requirements. (2016)**

- **A customer complained to the BCUC and questioned why their account was not credited hourly for generation from their Generating Facility. BC Hydro responded to explain how inflow/outflow is recorded and that any generation registered by the internal reader/monitor (e.g., inverter) will not match the electric outflow reading on the BC Hydro's meter as the Generating Facility supplies the electricity needs of the premises first. (2018)**

- **Three complaints regarding specific applications to the Program:**
  - **A customer was unsure where to direct their application. The customer came to BC Hydro's office to deliver their application and was directed to the Program website. (2015)**
  - **A complaint related to missing data that had not yet been provided to BC Hydro by the customer's installer. The Program team is working with the customer and the installer to resolve this issue. (2019)**
  - **A customer wrote to Premier John Horgan regarding challenges with the requirement for Annual Energy Output to match historical Annual Load in the case of newly constructed homes. BC Hydro had requested more information to determine an appropriate estimate of Annual Load for the customer. BC Hydro communicated with the customer, acquired the necessary information and the customer is now participating in the Program. (2019)**

- **In 2016, BC Hydro accidently revealed recipients' email addresses to other recipients when distributing an e-mail to the Program distribution list. The issue was immediately addressed through our Freedom of Information Coordinating Office and procedures were modified so that the mistake would not occur again. One customer complained to BC Hydro about this issue and BC Hydro responded with an apology and explained the steps being taken to prevent the issue from recurring. (2016)**

- **A customer complained to BC Hydro's Board of Directors regarding proposed amendments to the Program in the 2018 Amendment Application. BC Hydro explained rationale for the proposed amendments and that the customer's existing 1 kW solar installation would not be affected by the proposed amendments. (2018)**

- **A customer wrote to Minister of Energy, Mines and Petroleum Resources Michelle Mungall to urge the Government of B.C. to encourage more participation in the Program. The customer was encouraged to participate in the regulatory proceeding for the Application. (2019)**

- **A customer wrote to Minister of Energy, Mines and Petroleum Resources Michelle Mungall to express concerns with regards to the proposed amendments in the Application. BC Hydro responded to each of the**

customer's concerns and encouraged the customer to participate in the regulatory proceeding for the Application. (2019)

23.0 G. CUSTOMER AND STAKEHOLDER ENGAGEMENT

Reference: Net Metering Evaluation Report No. 4
Exhibit B-1, Appendix F, p. 11
RS 1289 – Customer Data

In the summary of inquiries, BC Hydro states that between April 2013 and March 2016 it responded to 616 phone calls and 401 emails.

1.23.2 Please discuss whether, and if so how, BC Hydro has addressed the complaints identified above.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.23.1 where we explain how BC Hydro addressed the complaints.