BC hydro
FOR GENERATIONS

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November 29, 2013

Ms. Erica Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

RE: Project No. 3698760
British Columbia Utilities Commission (BCUC)
British Columbia Hydro and Power Authority (BC Hydro)
Application for Approval of Charges Related to Meter Choices Program
Responses to Intervener Information Requests No. 1

BC Hydro writes in compliance with BCUC Order No. G-186-13 to provide, as Exhibit B-6-1, its responses to the following Intervener Information Requests No. 1:

1	British Columbia Pensioners' and Seniors' Organization, Active Support Against Poverty, BC Coalition of People with Disabilities, Counsel of Senior Citizens' Organization of BC, and Tenant Resource and Advisory Centre (**BCPSO**)
2	BC Sustainable Energy Association and the Sierra Club of British Columbia (**BCSEA**)
3	Commercial Energy Consumers Association of British Columbia (**CEC**)
4	Citizens for Safe Technology Society and Nomi Davis *et al.* (**CSTS**)
5	John Hurd (**Hurd**)
6	Roger Middleton (**Middleton**)
7	Rodney Polden (**Polden**)
8	Regional District Central Kootenay (**RDCK**)
9	Norm Ryder (**Ryder**)
10	James (Jim) Stachow (**Stachow**)
11	David Wong (**Wong**)

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

(for) Janet Fraser
Chief Regulatory Officer

jc/ma

Enclosure (1)

Copy to: BCUC Project No. 3698760 (Application for Approval of Charges Related to Meter Choices Program) Registered Intervener Distribution List.

REQUESTOR NAME:	BCPSO
INFORMATION REQUEST ROUND NO:	1
TO:	BRITISH COLUMBIA HYDRO & POWER AUTHORITY
DATE:	November 6, 2013
APPLICATION NAME:	Application for Approval of Charges Related to Meter Choices Program

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1.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)

1.1 For each customer class where smart meters have been installed please indicate the following:

a) The total number of metered customers/premises;

b) The number of "eligible premises";

c) The number of premises where smart meters have been installed;

d) The number of premises where customers have requested that the smart meter installation be put on hold; and

e) The number of premises where smart meter installation has not been completed for some other reason.

f) If the sum of c) through e) does not equal the amount reported under part b), please explain why.

1.2 What are the "various reasons" for the other 15,000 smart meter installations not having been completed?

1.2.1 Is there an expectation that all of these installations will be completed within the next six months? If not, why not?

2.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)
Exhibit B-1, page 2-3 (lines 2-17)

2.1 After customers have indicated to BC Hydro (via the various means outlined on page 2-3) that they did not wish a smart meter installed, was there any formal notification process that had to be followed or was the initial notification sufficient?

2.1.1 If a formal notification was required, what was it?

2.1.2 Has this process changed since Direction No. 4 was issued on September 25, 2013?

3.0 Reference: Exhibit B-1, page 2-4 (lines 22-24) to page 2-5 (lines 1-13)

3.1 Has BC Hydro considered notifying customers of their meter choices through alternative methods in addition to its written communications (e.g., by telephone)?

3.1.1 How will BC Hydro ensure that all eligible customers (particularly those with low literacy levels or other barriers) will be adequately informed of the ramifications of not confirming their choice by December 1, 2013?

4.0 Reference: Exhibit B1, page 1-3 (lines 9-13)
Exhibit B1, page 2-8 (lines 4-17

4.1 What is considered "an obstruction" (per page 2-8)?

4.1.1 Does it included locked premises where the customer is absent and access is required to complete the installation?

4.2 Please confirm that the failed installation charge still apply if the "issue of obstruction" is resolved with the customer through BC Hydro's follow up call.

4.3 Does BC Hydro pre-arrange (with the customer) the appointment time at which the installation of a legacy meter, radio-off meter or smart meter will occur and ensure that it is satisfactory from the customer's perspective?

4.4 Does BC Hydro offer any compensation to customers for failing to meet appointments it has made with customers? If so, what is it?

5.0 Reference: Exhibit B-1, page 1-8 (lines 6-11)
Exhibit B-1, page 3-2 (lines 14-16)

Preamble: BC Hydro indicates (page 3-2) that it plans on recording the revenues received from the new charges related to the Meter Choices Program as Miscellaneous Revenues.

5.1 Please confirm that what will be recorded in the Regulatory Account is the net difference between the revenues collected from the new miscellaneous charges related to the Meter Choices program and the costs of the program.

6.0 Reference: Exhibit B-1, page 2-4 (lines 3-9)

6.1 For what length of time can the radio-off meters store interval consumption data (i.e. how many hours/days of data can be stored)?

7.0 Reference: Exhibit B-1, pages 2-4 to 2-5

7.1 Since September 2, 2013, how many customers who initially requested that their smart meter's installation be put on hold have now had a smart meter installed?

7.1.1 Were these customers made aware of the new government policy and the customer's options prior to installation?

7.2 How many of the 60,000 customers that continue to request that the meter exchange at their premises be put on hold are "eligible customers" as defined under Direction No. 4?

7.2.1 What makes the balance of the 60,000 ineligible?

7.3 How many customers have enrolled to date and what is the breakdown as to the number selecting the legacy meter versus the radio-off meter?

8.0 Reference: Exhibit B-1, page 2-7 (lines 5-8)
Exhibit B-1, Appendix C, page 11 of 17, Item 4.2.3 (b)
Exhibit B-1, page 3-16 to 3-17

8.1 Does BC Hydro have a current "inventory" of suitable Legacy Meters based on meters removed as part of its smart meter program?

8.1.1 If so, how many meters were in inventory as of August 31, 2013?

8.2 Will BC Hydro inform those customers choosing to retain a legacy meter of their current Legacy Meter's seal expiry date?

8.3 Will BC Hydro inform those customers choosing to retain a legacy meter that it estimates the current inventory of replacement legacy meters to last only until 2018?

9.0 Reference: Exhibit B-1, page 2-7 (lines 9-12)

9.1 If the premise to which customer moves has a legacy meter, will the customer be permitted to retain it at no charge? If not, why not, and what will the charge be?

10.0 Reference: Exhibit B-1, page 3-1 (lines 2-3)

10.1 Please confirm that eligible customers do not have three options (apart from the standard smart meter which they have already objected to).

10.2 Rather, please confirm that, for their current premises, eligible customers can choose either a radio-off smart meter or a legacy meter. Further, if the current legacy meter requires replacement/resealing, the option of a legacy meter only exists if BC Hydro has a suitable legacy meter in inventory

10.3 Also, please confirm that eligible customers moving to another premise can only choose to have a radio-off smart meter installed as an alternative to a standard smart meter.

11.0 Reference: Exhibit B-1, pages 3-6 to 3-7
FortisBC Radio-Off Meter Option Application, BCUC 1.3.1

11.1 With respect to lines 15-18 on page 3-6, please explain why it is necessary to install a radio-off meter as opposed to simply turning off the transmission capability in the existing smart meter at the new premise, as FortisBC is proposing to do in situations where a smart meter is already in place.

11.2 How much time does it take to remove an existing meter and install a radio-off meter?

11.3 What would be the difference in time and costs if the existing meter's radio was simply turned off, given that all that is required is disabling the radio as opposed to having to remove the existing smart meter and install a radio-off smart meter?

12.0 Reference: Exhibit B-1, page 3-9

12.1 Please explain more fully how the Radio-Off Information Technology capital costs were derived.

12.2 How will BC Hydro track the actual Information Technology capital costs incurred?

13.0 Reference: Exhibit B-1, page 3-10

13.1 What is the basis for assuming that 300 additional check meters will be required if 5,000 customers choose the legacy meter option?

14.0 Reference: Exhibit B-1, page 3-11

14.1 What does the "Percent of BC Hydro Service Territory" represent in Table 3-6? Is it the percentage of eligible customers in each Density? If not, please redo the Table using this definition.

15.0 Reference: Exhibit B-1, page 3-12 (lines 15-19)

15.1 In the detailed spreadsheet supporting the costs it is assumed that 84% of the range extenders will require a transformer. Please explain why.

16.0 Reference: Exhibit B-1, pages 3-14 and 3-15

16.1 Please explain more fully why the average meter exchange costs are a good proxy when no meter actually has to be exchanged (and the corresponding time incurred), but rather the radio only has to be reactivated, which BC Hydro indicates takes a relatively small amount of time.

17.0 Reference: Exhibit B-1, page 3-16

17.1 What is the basis for the assumption that annual IT maintenance and support costs will be 10% of the initial capital cost?

18.0 Reference: Exhibit B-1, pages 3-17 to 3-18

18.1 Please confirm that all eligible customers who opt to retain their legacy meter are sharing the costs of replacing the legacy meter (at time of seal expiry) with other legacy meter customers – even those who choose a radio-off smart meter or a normal smart meter when the current seal expires.

18.2 If confirmed, please explain why this viewed as being appropriate.

19.0 Reference: Exhibit B-1, pages 3-18 to 3-19

19.1 Prior to the implementation of smart meters, what was the level of resources that BC Hydro devoted to Theft Detection in terms of Field Investigators, Meter Technicians, Electrical Contractors and Analysts?

19.2 Is the level of additional resources relative to the number of continuing legacy meters comparable with past practice?

20.0 Reference: Exhibit B-1, page 3-19 to 3-21

20.1 Are there customers who currently provide (or provided prior to the installation of a smart meter) some of their bi-monthly meter readings either by phone, mail or internet such that their meters were physically read less than six times per year?

20.2 Has BC Hydro considered allowing customers retaining legacy meters to choose to have their meters physically read less frequently and provide the required the bi-monthly meter reading by such means?

21.0 Reference: Exhibit B-1, page 3-27 (lines 6-7)

21.1 Please confirm that eligible customers who have put the installation of a smart meter on hold and do not communicate a choice to BC Hydro by December 1, 2013 will be treated as if they had opted to retain their legacy meter.

21.2 Under what conditions would an eligible customer be "deemed" to have elected to have a radio-off meter installed?

21.3 Since the BC Hydro meter installer was unable to install the meter, why is the cost for attending the customer's premise ($55) assumed to the same as the cost associated with attending the premise plus spending time to remove the existing meter and install a replacement?

21.4 Please explain why the Collection Charge (as outlined in Section 6.5 of the Electric Tariff) is more representative of the cost incurred in making a trip to the customer's premise but then not performing any actual work.

22.0 Will eligible customers choosing not to accept a smart meter be responsible for the costs of this regulatory proceeding?

1.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)

1.1.1 For each customer class where smart meters have been installed please indicate the following:

a) The total number of metered customers/premises;

b) The number of "eligible premises";

c) The number of premises where smart meters have been installed;

d) The number of premises where customers have requested that the smart meter installation be put on hold; and

e) The number of premises where smart meter installation has not been completed for some other reason.

f) If the sum of c) through e) does not equal the amount reported under part b), please explain why.

RESPONSE:

The information is provided in the following table:

Smart Meter Installations, by Customer Rate Class			
	Residential rate class	**General Service rate class**	**Total**
a) Total number of metered customers/ premises	1,708,000	194,000	1,902,000
b) Number of "eligible premises" as defined in the Smart Meters and Smart Grid Regulation	1,641,000	186,000	1,827,000
c) Number of premises where smart meters have been installed	1,641,000	186,000	1,827,000
d) Number of premises where customers have requested that the smart meter installation be put on hold	55,000	5,000	60,000

Smart Meter Installations, by Customer Rate Class			
	Residential rate class	**General Service rate class**	**Total**
e) Number of premises where smart meter installation has not been completed for some other reason	12,000	3,000	15,000
		Subtotal:	**1,902,000**
f) If the sum of c) through e) does not equal the amount reported under part b), please explain why	Not applicable		

1.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)

1.1.2 What are the "various reasons" for the other 15,000 smart meter installations not having been completed?

RESPONSE:

Please refer to the response to BCSEA IR 1.3.1.

1.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)

1.1.2.1 Is there an expectation that all of these installations will be completed within the next six months? If not, why not?

RESPONSE:

Please refer to the response to BCSEA IR 1.3.2.

2.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)
Exhibit B-1, page 2-3 (lines 2-17)

1.2.1 After customers have indicated to BC Hydro (via the various means outlined on page 2-3) that they did not wish a smart meter installed, was there any formal notification process that had to be followed or was the initial notification sufficient?

RESPONSE:

Formal notification was not required.

2.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)
Exhibit B-1, page 2-3 (lines 2-17)

1.2.1.1 If a formal notification was required, what was it?

RESPONSE:

Please refer to the response to BCPSO IR 1.2.1.

2.0 Reference: Exhibit B-1, page 1-1 (lines 8-19)
Exhibit B-1, page 2-3 (lines 2-17)

1.2.1.2 Has this process changed since Direction No. 4 was issued on September 25, 2013?

RESPONSE:

Yes, except that the process changed during the week of September 9, 2013 with the launch of the Meter Choices Program.

3.0 Reference: Exhibit B-1, page 2-4 (lines 22-24) to page 2-5 (lines 1-13)

1.3.1 Has BC Hydro considered notifying customers of their meter choices through alternative methods in addition to its written communications (e.g., by telephone)?

RESPONSE:

Yes, starting mid-November, BC Hydro call center agents are proactively calling customers who have yet to respond to Meter Choices Program.

3.0 Reference: Exhibit B-1, page 2-4 (lines 22-24) to page 2-5 (lines 1-13)

1.3.1.1 How will BC Hydro ensure that all eligible customers (particularly those with low literacy levels or other barriers) will be adequately informed of the ramifications of not confirming their choice by December 1, 2013?

RESPONSE:

As described in the response to BCPSO IR 1.3.1, starting mid-November BC Hydro is also using outbound calls to inform customers who have yet to respond to the enrolment form about the ramification of not confirming a choice. In addition, since submitting the Meter Choices Program Application, BC Hydro is also adding additional reminder letters during the month of November. Please refer to the response to BCUC IR 1.3.1 for copies of the reminder letters.

BC Hydro's dedicated smart meter call centre also uses a translation service if there are language issues.

4.0 Reference: Exhibit B1, page 1-3 (lines 9-13)
Exhibit B1, page 2-8 (lines 4-17

1.4.1 What is considered "an obstruction" (per page 2-8)?

RESPONSE:

"An obstruction" refers to anything that blocks reasonable, safe, physical access to the meter base including by debris, unsafe walkways or other means of access, or the presence of animals, and the customer does not remedy the problem upon being requested by BC Hydro.

4.0 Reference: Exhibit B1, page 1-3 (lines 9-13)
Exhibit B1, page 2-8 (lines 4-17

1.4.1.1 Does it included locked premises where the customer is absent and access is required to complete the installation?

RESPONSE:

According to the terms of service outlined in the BC Hydro Electric Tariff, customers must provide clear, unobstructed access to BC Hydro's equipment. It is a customer's responsibility to ensure BC Hydro has full access to the meter and is required to make arrangements with BC Hydro if specialized access is required.

In the Meter Choices Program "confirmation of choice" letter sent to customers that have elected radio-off or smart meter, it specially mentions the following:

"*You don't need to be home as long as we have safe and clear access to our meter – please remove any barriers that could prevent the exchange. Meter installation will usually take place Monday to Friday between 8 a.m. and 8 p.m. PST. Meter installers will knock on your door before starting any work and always wear photo identification badges. If BC Hydro or our authorized contractor cannot access the meter a failed installation cost will be added to your bill. If you need to make access arrangements, please contact a Smart Metering Specialist as soon as possible at 1 800 409 8199."*

A copy of this letter is provided as an attachment to the response to BCUC IR 1.3.1.

4.0 Reference: Exhibit B1, page 1-3 (lines 9-13)
Exhibit B1, page 2-8 (lines 4-17

1.4.2 Please confirm that the failed installation charge still apply if the "issue of obstruction" is resolved with the customer through BC Hydro's follow up call.

RESPONSE:

As noted in the response to BCPSO IR 1.4.1.1, BC Hydro asked the customer to remove any barriers and contact BC Hydro if special arrangements need to be made. If the customer did not remove any barriers or contact BC Hydro to make special arrangements, the cost associated with that failed meter exchange will have to be recovered from the customer that failed to provide reasonable access. Resolving the access issue prior to BC Hydro attending at the premises will avoid the failed installation charge.

4.0 Reference: Exhibit B1, page 1-3 (lines 9-13)
Exhibit B1, page 2-8 (lines 4-17

1.4.3 Does BC Hydro pre-arrange (with the customer) the appointment time at which the installation of a legacy meter, radio-off meter or smart meter will occur and ensure that it is satisfactory from the customer's perspective?

RESPONSE:

When a customer chooses a smart meter or a radio-off meter that requires a BC Hydro installer to visit the customer's premises, BC Hydro sends a confirmation letter to ask the customer to contact BC Hydro as soon as possible if special access arrangements are necessary. Due to the high number of meter exchanges, BC Hydro is unable to schedule appointment times for each and every customer. Customers that require special arrangements are asked to contact BC Hydro to make the necessary appointments for their meter installation.

Please refer to the response to BCUC IR 1.3.1 for a copy of the confirmation letter.

4.0 Reference: Exhibit B1, page 1-3 (lines 9-13)
Exhibit B1, page 2-8 (lines 4-17

1.4.4 Does BC Hydro offer any compensation to customers for failing to meet appointments it has made with customers? If so, what is it?

RESPONSE:

No, BC Hydro does not offer compensation to customers for failing to meet appointments.

5.0 Reference: Exhibit B-1, page 1-8 (lines 6-11)
Exhibit B-1, page 3-2 (lines 14-16)

BC Hydro indicates (page 3-2) that it plans on recording the revenues received from the new charges related to the Meter Choices Program as Miscellaneous Revenues.

1.5.1 Please confirm that what will be recorded in the Regulatory Account is the net difference between the revenues collected from the new miscellaneous charges related to the Meter Choices program and the costs of the program.

RESPONSE:

Not confirmed. The regulatory account captures costs beginning January 1, 2013 whereas the Meter Choices Program did not start until summer 2013. These costs will be deferred through March 31, 2014 net of the related revenues collected.

6.0 Reference: Exhibit B-1, page 2-4 (lines 3-9)

1.6.1 For what length of time can the radio-off meters store interval consumption data (i.e. how many hours/days of data can be stored)?

RESPONSE:

For the majority of residential customers with energy only meters, the radio-off version of the meter can store approximately 540 days of data. While the radio-off meter has the storage capacity, theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles). BC Hydro needs to collect the interval data as well as events and alarms from radio-off meters at a minimum of every two months in order to perform timely electricity balance analysis.

BC Hydro also has to collect the meter data on a regular basis to ensure timely and accurate billing.

7.0 Reference: Exhibit B-1, pages 2-4 to 2-5

1.7.1 Since September 2, 2013, how many customers who initially requested that their smart meter's installation be put on hold have now had a smart meter installed?

RESPONSE:

The Meter Choices Program enrolment period is underway and will end on December 1, 2013. Rather than provide mid-enrolment-period data with its response to Round 1 IRs, BC Hydro believes it would be more efficient to provide data in relation to Meter Choices Program enrolment with its response to Round 2 IRs which are scheduled to be filed after the enrolment period ends. Accordingly, BC Hydro will provide Meter Choices Program enrolment data with its response to Round 2 IRs.

7.0 Reference: Exhibit B-1, pages 2-4 to 2-5

1.7.1.1 Were these customers made aware of the new government policy and the customer's options prior to installation?

RESPONSE:

BC Hydro has been informing eligible customers who contacted BC Hydro on the choices available to them based on the government's announcement of July 18, 2013. BC Hydro's website has also been updated with specific Meter Choices Program information.

Eligible customers were informed that they would be receiving a letter from BC Hydro outlining their options, informing them of the December 1, 2013 deadline, and that they would default to the legacy meter option if they do not make an election. These letter were sent in September 2013.

7.0 Reference: Exhibit B-1, pages 2-4 to 2-5

1.7.2 How many of the 60,000 customers that continue to request that the meter exchange at their premises be put on hold are "eligible customers" as defined under Direction No. 4?

RESPONSE:

Of the 60,000 customers that requested their meter installation be put on hold, 55,000 were residential and are eligible for the Meter Choices Program. The remainder were commercial customers and are therefore not eligible for the legacy and radio-off meter options.

7.0 Reference: Exhibit B-1, pages 2-4 to 2-5

1.7.2.1 What makes the balance of the 60,000 ineligible?

RESPONSE:

Please refer to the response to BCPSO IR 1.7.2.

7.0 Reference: Exhibit B-1, pages 2-4 to 2-5

1.7.3 How many customers have enrolled to date and what is the breakdown as to the number selecting the legacy meter versus the radio-off meter?

RESPONSE:

The meter choices enrolment period is underway and will end on December 1, 2013. Rather than provide mid-enrolment-period data with its response to Round 1 IRs, BC Hydro believes it would be more efficient to provide data in relation to Meter Choices Program enrolment with its response to Round 2 IRs which are scheduled to be filed after the enrolment period ends. Accordingly, BC Hydro will provide Meter Choices Program enrolment data with its response to Round 2 IRs.

8.0 Reference: Exhibit B-1, page 2-7 (lines 5-8)
Exhibit B-1, Appendix C, page 11 of 17, Item 4.2.3 (b)
Exhibit B-1, page 3-16 to 3-17

1.8.1 Does BC Hydro have a current "inventory" of suitable Legacy Meters based on meters removed as part of its smart meter program?

RESPONSE:

During the Smart Metering Program mass deployment, legacy meters removed from customer premises were recycled. Since the start of the Meter Choices Program in September, when BC Hydro exchanges a legacy meter with its Measurement Canada seal valid beyond 2015, the legacy meter is retained as inventory.

8.0 Reference: Exhibit B-1, page 2-7 (lines 5-8)
Exhibit B-1, Appendix C, page 11 of 17, Item 4.2.3 (b)
Exhibit B-1, page 3-16 to 3-17

1.8.1.1 If so, how many meters were in inventory as of August 31, 2013?

RESPONSE:

As of August 31, 2013, there were several hundred single phase energy meters and about 500 demand legacy meters in inventory.

8.0 Reference: Exhibit B-1, page 2-7 (lines 5-8)
Exhibit B-1, Appendix C, page 11 of 17, Item 4.2.3 (b)
Exhibit B-1, page 3-16 to 3-17

1.8.2 Will BC Hydro inform those customers choosing to retain a legacy meter of their current Legacy Meter's seal expiry date?

RESPONSE:

No. BC Hydro will inform customers when the meter seal of the legacy meter at their premises is expiring and that an exchange is required.

8.0 Reference: Exhibit B-1, page 2-7 (lines 5-8)
Exhibit B-1, Appendix C, page 11 of 17, Item 4.2.3 (b)
Exhibit B-1, page 3-16 to 3-17

1.8.3 Will BC Hydro inform those customers choosing to retain a legacy meter that it estimates the current inventory of replacement legacy meters to last only until 2018?

RESPONSE:

Consistent with historical meter replacement practices, only the customers with an expiring meter seal will receive notice of an upcoming meter exchange. The legacy meters currently in-use by eligible customers and in BC Hydro's inventory have seal expirations ranging from 2011 to 2021. Since BC Hydro will replace a legacy meter with an expired seal with another legacy meter only as long as stock is available, the time period through which a legacy meter can be replaced by another legacy meter will depend upon the number of Meter Choices Program participants over time.

9.0 Reference: Exhibit B-1, page 2-7 (lines 9-12)

1.9.1 If the premise to which customer moves has a legacy meter, will the customer be permitted to retain it at no charge? If not, why not, and what will the charge be?

RESPONSE:

No. In accordance with section 4.2.3(d) of the BC Hydro Electric Tariff, a customer with a legacy meter in place at the customer's premises who moves to another premises for which the customer is eligible to take residential service, can elect to have a smart meter or radio-off meter installed at the new premises but cannot retain or have installed a legacy meter at the new premises.

10.0 Reference: Exhibit B-1, page 3-1 (lines 2-3)

1.10.1 Please confirm that eligible customers do not have three options (apart from the standard smart meter which they have already objected to).

RESPONSE:

Eligible customers that do not have a smart meter installed at their premises have three options: (1) the installation of a standard smart meter, (2) the installation of a radio-off meter, or (3) the existing legacy meter can remain installed at the premises. Objection to the smart meter is not a required criterion for the customer to be eligible for the Meter Choices Program.

Any customer at their own expense may request that the meter at their premises be relocated to another location on the property.

10.0 Reference: Exhibit B-1, page 3-1 (lines 2-3)

1.10.2 Rather, please confirm that, for their current premises, eligible customers can choose either a radio-off smart meter or a legacy meter. Further, if the current legacy meter requires replacement/resealing, the option of a legacy meter only exists if BC Hydro has a suitable legacy meter in inventory

RESPONSE:

Any eligible customer can at any time choose to have a smart meter installed at their premises, and BC Hydro will install one at the customer's premises at no additional cost.

In accordance with section 4.2.3(b) of the BC Hydro Electric Tariff, if the seal of a legacy meter expires, or the meter ceases to function properly before the seal expiry date, BC Hydro will, so long as it has a suitable legacy meter in its meter inventory available for installation, install a replacement legacy meter at the eligible customer's premises.

10.0 Reference: Exhibit B-1, page 3-1 (lines 2-3)

1.10.3 Also, please confirm that eligible customers moving to another premise can only choose to have a radio-off smart meter installed as an alternative to a standard smart meter.

RESPONSE:

Confirmed. Please refer to sections 4.2.3(d) and 4.2.4(b) of the BC Hydro Electric Tariff.

11.0 Reference: Exhibit B-1, pages 3-6 to 3-7
FortisBC Radio-Off Meter Option Application, BCUC 1.3.1

1.11.1 With respect to lines 15-18 on page 3-6, please explain why it is necessary to install a radio-off meter as opposed to simply turning off the transmission capability in the existing smart meter at the new premise, as FortisBC is proposing to do in situations where a smart meter is already in place.

RESPONSE:

Please refer to the response to BCSEA IR 1.9.6.

11.0 Reference: Exhibit B-1, pages 3-6 to 3-7
FortisBC Radio-Off Meter Option Application, BCUC 1.3.1

1.11.2 How much time does it take to remove an existing meter and install a radio-off meter?

RESPONSE:

The time required to travel to the customer's premises to exchange the meter varies, and is dependent upon travelling distance. Once the meter installer is at the customer's premises, and assuming there is clear access to the existing meter, the meter install process will take approximately 10 to 12 minutes on average with approximately one minute of that time required to remove and replace the meter.

11.0 Reference: Exhibit B-1, pages 3-6 to 3-7
FortisBC Radio-Off Meter Option Application, BCUC 1.3.1

1.11.3 What would be the difference in time and costs if the existing meter's radio was simply turned off, given that all that is required is disabling the radio as opposed to having to remove the existing smart meter and install a radio-off smart meter?

RESPONSE:

Please refer to the response to BCSEA IR 1.9.6.

12.0 Reference: Exhibit B-1, page 3-9

1.12.1 Please explain more fully how the Radio-Off Information Technology capital costs were derived.

RESPONSE:

Please refer to the response to BCUC IR 1.8.2.

Note that the heading on Table 3-4 in the Application should read "Meter Choices Program Information Technology Costs."

12.0 Reference: Exhibit B-1, page 3-9

1.12.2 How will BC Hydro track the actual Information Technology capital costs incurred?

RESPONSE:

Actual Meter Choices Program capital costs will be recorded separately from other BC Hydro capital costs (including SMI), and reported using the categories identified in Table 3-4, on page 3-9 of the Application.

13.0 Reference: Exhibit B-1, page 3-10

1.13.1 What is the basis for assuming that 300 additional check meters will be required if 5,000 customers choose the legacy meter option?

RESPONSE:

Incremental check meters are necessitated by the sustained presence of legacy meters, and preserve the integrity of the energy balance approach in areas where metering data is either incomplete or unavailable. At a level of 5,000 legacy meters there will be multiple locations with incomplete data on the vast majority of BC Hydro's approximately 1,200 active distribution feeders. A more detailed response cannot be provided due to confidentiality concerns.

14.0 Reference: Exhibit B-1, page 3-11

1.14.1 What does the "Percent of BC Hydro Service Territory" represent in Table 3-6? Is it the percentage of eligible customers in each Density? If not, please redo the Table using this definition.

RESPONSE:

Please refer to the response to BCUC IR 1.2.1.

15.0 Reference: Exhibit B-1, page 3-12 (lines 15-19)

1.15.1 In the detailed spreadsheet supporting the costs it is assumed that 84% of the range extenders will require a transformer. Please explain why.

RESPONSE:

Range extenders operate at secondary voltage levels. The installation of a transformer is required in instances wherein secondary voltage is not available at the site, and primary voltage must be converted to secondary voltage. Schedule A-7a indicates that in 81 per cent of range extender installations, a transformer will be required. This figure is based on the actual incidence of transformer installations for range extenders installed at the time of the analysis.

16.0 Reference: Exhibit B-1, pages 3-14 and 3-15

1.16.1 Please explain more fully why the average meter exchange costs are a good proxy when no meter actually has to be exchanged (and the corresponding time incurred), but rather the radio only has to be reactivated, which BC Hydro indicates takes a relatively small amount of time.

RESPONSE:

A BC Hydro representative must attend the customer's premises to reactivate the radio, and the time required to reactivate the radio is relatively small. As a result, the meter exchange cost is assumed to be a good proxy for the cost to reactivate the radio.

Please refer to the response to BCPSO IR 1.21.3 for information on the cost of attending the customer's premises.

17.0 Reference: Exhibit B-1, page 3-16

1.17.1 What is the basis for the assumption that annual IT maintenance and support costs will be 10% of the initial capital cost?

RESPONSE:

The use of 10 to 20 per cent is an industry standard range for estimating ongoing maintenance costs associated with IT infrastructure and enterprise applications. The lower end of the range was used based on an assessment of the IT expenditures and underlying applications.

18.0 Reference: Exhibit B-1, pages 3-17 to 3-18

1.18.1 Please confirm that all eligible customers who opt to retain their legacy meter are sharing the costs of replacing the legacy meter (at time of seal expiry) with other legacy meter customers – even those who choose a radio-off smart meter or a normal smart meter when the current seal expires.

RESPONSE:

Not confirmed. While it is the case that the cost analysis spans a number of years and therefore assumes that customers choosing a legacy meter will continue with that option until there are no legacy meters left in inventory, a customer migrating away from the legacy meter option (to either a radio-off meter or a smart meter) will no longer pay the charges associated with the legacy meter option.

18.0 Reference: Exhibit B-1, pages 3-17 to 3-18

1.18.2 If confirmed, please explain why this viewed as being appropriate.

RESPONSE:

Please refer to the response to BCPSO IR 1.18.1.

19.0 Reference: Exhibit B-1, pages 3-18 to 3-19

1.19.1 Prior to the implementation of smart meters, what was the level of resources that BC Hydro devoted to Theft Detection in terms of Field Investigators, Meter Technicians, Electrical Contractors and Analysts?

RESPONSE:

This information was provided in the response to BCUC IR 1.18.1 which has been filed on a confidential basis.

19.0 Reference: Exhibit B-1, pages 3-18 to 3-19

1.19.2 Is the level of additional resources relative to the number of continuing legacy meters comparable with past practice?

RESPONSE:

Please refer to the response to Skogstad IR 1.2.1.

20.0 Reference: Exhibit B-1, page 3-19 to 3-21

1.20.1 Are there customers who currently provide (or provided prior to the installation of a smart meter) some of their bi-monthly meter readings either by phone, mail or internet such that their meters were physically read less than six times per year?

RESPONSE:

Some customers do provide self-reads in limited circumstances where on-site meter reading could not take place, for validation purposes. Please refer to the response to BCUC IR 1.9.2.

20.0 Reference: Exhibit B-1, page 3-19 to 3-21

1.20.2 Has BC Hydro considered allowing customers retaining legacy meters to choose to have their meters physically read less frequently and provide the required the bi-monthly meter reading by such means?

RESPONSE:

Please refer to the response to BCUC IR 1.9.2.

21.0 Reference: Exhibit B-1, page 3-27 (lines 6-7)

1.21.1 Please confirm that eligible customers who have put the installation of a smart meter on hold and do not communicate a choice to BC Hydro by December 1, 2013 will be treated as if they had opted to retain their legacy meter.

RESPONSE:

Confirmed. Please refer to section 4.2.2(d) of BC Hydro's Electric Tariff.

21.0 Reference: Exhibit B-1, page 3-27 (lines 6-7)

1.21.2 Under what conditions would an eligible customer be "deemed" to have elected to have a radio-off meter installed?

RESPONSE:

If an eligible customer with a legacy or radio-off meter installed at the customer's premises moves to another premises for which the customer is eligible to take residential service, the customer can elect to have a smart meter or radio-off meter installed at the new premises. If the customer refuses or fails to make an election (i.e., smart meter or radio-off meter), the customer will be deemed to have elected the radio-off meter. Note that any eligible customer, including the customer in the scenario above, can at any time choose to have a smart meter installed at their premises, and BC Hydro will install one at the customer's premises at no additional cost.

21.0 Reference: Exhibit B-1, page 3-27 (lines 6-7)

1.21.3 Since the BC Hydro meter installer was unable to install the meter, why is the cost for attending the customer's premise ($55) assumed to the same as the cost associated with attending the premise plus spending time to remove the existing meter and install a replacement?

RESPONSE:

A significant proportion of this cost is a result of travelling time rather than the actual meter exchange once the BC Hydro representative has reached the customer's premises.

Please also refer to the response to BCPSO IR 1.11.2.

21.0 Reference: Exhibit B-1, page 3-27 (lines 6-7)

1.21.4 Please explain why the Collection Charge (as outlined in Section 6.5 of the Electric Tariff) is more representative of the cost incurred in making a trip to the customer's premise but then not performing any actual work.

RESPONSE:

The Collection Charge pursuant to the BC Hydro Electric Tariff is not representative of the current cost of attendance at a customer's premises to install a meter.

22.0 Will eligible customers choosing not to accept a smart meter be responsible for the costs of this regulatory proceeding?

RESPONSE:

No. The costs of this regulatory proceeding will be added to the SMI Regulatory Account.

REQUESTOR NAME: **BC Sustainable Energy Association and Sierra Club BC**
INFORMATION REQUEST ROUND NO: **1**
TO: **BC Hydro**
DATE: **November 6, 2013**
PROJECT NO:
APPLICATION NAME: **BC Hydro Smart Meter Choices Application**

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges
Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

Rates

3 (1) In setting rates under the Act for the authority, the commission must ensure that the rates allow the authority to collect sufficient revenue in each fiscal year to enable it to recover the following costs from the following customers:

(a) program costs, investigation costs and infrastructure costs from

(i) applicable customers at applicable premises where a legacy meter or radio-off meter is installed, to the extent that the authority requests recovery of any of those costs from these customers, and

(ii) all customers, to the extent that any of those costs are not recovered under subparagraph (i);

(b) from all customers, costs incurred with respect to the installation and operation of, and services related to, smart meters;

(c) failed installation costs from customers at a premises where a failed installation occurred.

"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1 Please confirm that BC Hydro is seeking Commission approval in this proceeding of the proposed Miscellaneous Charges set out in section 11.3 of the Electric Tariff "black lined" on pages 19 and 20 of 20 of Appendix C. Alternatively, please explain.

1.2 Are all of the proposed Miscellaneous Charges set out in section 11.3 of the Electric Tariff described by subparagraph 3(1)(a)(i) of Direction 4? If not, please explain.

1.2.1 Does BC Hydro assert that the proposed s.11.3 Miscellaneous Charges would allow BC Hydro to recover exclusively "program costs, investigation costs and infrastructure costs from (i) applicable customers at applicable premises where a legacy meter or radio-off meter is installed"? If not, please explain.

1.3 In BC Hydro's view, what legal provisions apply to the Commission's consideration of approval of the proposed s.11.3 Miscellaneous Charges?

1.4 In BC Hydro's view, does Direction 4, s.3(1)(a)(i) – either generally, or in particular the phrase "to the extent the authority requests recovery" -- mean that the Commission must approve exactly the amount of the Electric Tariff section 11.3 rates for legacy and radio-off services to legacy and radio-off customers for which BC Hydro requests approval?

1.4.1 In BC Hydro's view, does s.3(1)(a)(i) of Direction 4, or any other legal provision, prevent the Commission from determining that the proposed s.11.3 Miscellaneous Charges would allow BC Hydro to collect more revenue than the corresponding "program costs, investigation costs and infrastructure costs" (as defined)?

1.4.2 If so, why?

1.4.3 If not, is the Commission empowered to reduce the s.11.3 Miscellaneous Charges from the amounts proposed by BC Hydro to amounts that the Commission determines would allow BC Hydro to recover no more revenue than the corresponding costs?

1.5 Please explain BC Hydro's statement that "the scope of review relates primarily to determining the quantum of the required charges."

1.5.1 In BC Hydro's view, is the Commission at liberty in this proceeding to allocate recovery of legacy and radio-off costs (as defined) between legacy and radio-off customers under s.3(1)(a)(i) and "all customers" under s.3(1)(a)(ii)?

1.5.2 If so, in BC Hydro's view, what considerations should the Commission take into account in making such an allocation?

1.5.3 If not, why not?

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.6 Please confirm that it is BC Hydro's position that all "program costs, investigation costs and infrastructure costs" (as defined) would be

recovered from legacy and radio-off customers if the proposed s.11.3 Miscellaneous Charges are approved.

1.6.1 Has BC Hydro identified any "program costs, investigation costs and infrastructure costs" (as defined) that it proposes would be recovered from "all customers" under s.3(1)(a)(ii) of Direction 4? If so, please explain.

1.7 In BC Hydro's view, does s.3(1)(a) preclude the Commission from determining that legacy and radio-off costs (as defined) were not prudently incurred?

1.8 Please confirm that s.3(1)(b) of Direction speaks to "smart meter costs," not to meter choice costs.

1.9 In BC Hydro's view, does s.3(1)(b) preclude the Commission from determining that smart meter costs (as defined) were not prudently incurred?

1.10 In BC Hydro's view, does s.3(1)(b) preclude the Commission from determining that smart meter costs (as defined) should be allocated differentially to different customer classes in a rate rebalancing proceeding?

1.11 In BC Hydro's view, does s.3(1)(c) apply only prospectively? That is, in BC Hydro's view, does s.3(1)(c) require the Commission to allow rate recovery regarding failed installation costs only where the "failed installation" (as defined) occurs after the effective date of the amendment of the Electric Tariff required by s.3(3) of Direction 4?

1.12 More generally, where a customer has a legacy meter due to the customer's objection to installation of a smart meter and the objection was made at a time prior to the effective date of Order G-166-13, does BC Hydro intend to attempt to recover from the customer the costs related to attendance at the customer's premises to install the smart meter?

2.0 Topic: Discretion of BC Hydro
Reference: Exhibit B-1, pages 1-1, 1-2

"The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option. Direction No. 4 was issued on September 25, 2013, and provides direction to the BCUC with respect to implementing the Government policy.

Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:..."

2.1 Does BC Hydro agree that Direction 4 binds the Commission in various respects but does not directly bind BC Hydro?

2.2 Please file any document(s), apart from Direction 4, that conveys the Government's requirements or requests to BC Hydro concerning the smart meter choices program.

2.3 Please provide a table listing key elements of the smart meter choice program and indicating for each element whether it is required by Direction 4, required by some other Government instruction, or the outcome of BC Hydro's exercise of its own discretion.

2.4 What directions or instructions has the Government provided to BC Hydro concerning how BC Hydro is to respond in the event that customers refuse or fail to pay the meter choice program charges?

2.4.1 How will BC Hydro respond in the event that customers refuse or fail to pay the meter choice program charges?

3.0 Topic: Incomplete smart meter installations for 'other reasons'
Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]

"Eligible Customer Factsheet" states:

Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

4.2.1. Meter Types

BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.

Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

3.1 What are the "various reasons" for the 15,000 incomplete smart meter installations?

3.2 When does BC Hydro expect to complete all smart meter installations apart from premises where the customer elects a legacy or radio-off meter or is deemed to elect a legacy meter?

3.3 Please explain fully the proposed treatment of situations where customers do not have an installed smart meter for reasons other than the customer's objection to installation of a smart meter.

3.4 How does the existence of some 15,000 incomplete smart meter installations jibe with the requirement in Electric Tariff 4.2.1 that "Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises"?

3.5 Does BC Hydro have authority to allow a legacy meter to remain in operation for a reason not referred to in section 4.2.2? If so, please explain. If not, what is BC Hydro going to do about any as-yet incomplete smart meter installations?

3.6 Does section 4.2.2(d) have the effect of causing a customer who has a legacy meter for one of the "various reasons" other than the customer's objection to having smart meter to be deemed as of December 1, 2013 to have elected to retain the existing legacy meter, thereby triggering the requirement that the customer "shall pay the charges for having a Legacy Meter..."?

3.6.1 If not, why not?

3.6.2 If so, is BC Hydro intending to apply Legacy Meter monthly charges to residential customers who retain a legacy meter for reasons other than the customer's objection to a smart meter?

3.7 The "Eligible Customer Factsheet" says that "Only residential customers who asked to delay the installation of a smart meter are eligible to make the choice [to retain a legacy meter or to have a radio-off meter]." Is this provision incorporated in the amendments to the Electric Tariff? If so, please provide a reference to the applicable Tariff provision.

4.0 Topic: Eligible Customer Factsheet
Reference: Exhibit B-1, Appendix F, "Eligible Customer Factsheet"

4.1 Please identify any provisions of the "Eligible Customer Factsheet" that are not implemented in the amended Electric Tariff.

5.0 Topic: Order requested
Reference: Exhibit B-1, Appendix D, Draft Order; Exhibit A-1, Order G166-13

5.1 Please provide a table showing (a) Electric Tariff amendments (approved) and other Commission orders per Order G-166-13 and (b) requested Electric Tariff amendments and Commission orders. (The intention is to understand exactly what Commission decisions BC Hydro is seeking that have not already been made in Order G-166-13.)

6.0 Topic: Smart meter refusals
Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons."

6.1 What is the current status of the number of smart meter refusals?

6.2 Please provide the number of smart meter refusals as a percentage of customers by rate class and by geographic sub-area of BC Hydro's service territory.

6.3 Of the 1.9 million smart meter installations, how many are 'radio-on' and how many are 'radio-off'?

6.3.1 If any installed smart meters are 'radio-off,' please provide the reasons and the corresponding numbers.

6.3.2 How many installed smart meters are 'radio-off' due at the request of the particular customer?

6.4 With reference to "2.3.3.2 Reminder Letters to Eligible Customers," please quantify how many such letters were sent, how many responses were received, how many responses indicated objection to a smart meter, how many smart meters have been installed at these customers' premises, and how many smart meters remain to be installed at these customers' premises.

7.0 Topic: Rationales for program features
Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:
1. the installation of a standard smart meter
2. the installation of a **radio-off meter**[3] or
3. the existing **legacy meter**[4] can remain installed at the premises"

7.1 Please confirm that the meter choice program is not available to a residential customer who has a smart meter currently installed under the following circumstances:

7.1.1 the customer respected BC Hydro's legal authority to replace the legacy meter with a smart meter and therefore did not obstruct or otherwise refuse to allow BC Hydro to install a smart meter at the customer's premises,

7.1.2 the customer was unaware that BC Hydro intended to replace the legacy meter with a smart meter and therefore did not obstruct or otherwise refuse to allow BC Hydro to install a smart meter at the customer's premises, or

7.1.3 the customer was persuaded by BC Hydro to allow the legacy meter to be replaced by a smart meter at the customer's premises and therefore did not obstruct or otherwise refuse to allow BC Hydro to install a smart meter at the customer's premises.

7.2 In its communications with customers about the impending installation of smart meters did BC Hydro or Corix inform customers that if they successfully obstructed or refused to allow BC Hydro to install a smart meter they would be eligible to choose to retain their legacy meter or have a radio-off smart meter?

7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

7.3.1 A residential customer with an installed smart meter is not allowed to choose (and pay the fees for) a radio-off smart meter; but a residential customer with a legacy meter is allowed to choose (and pay the fees for) a radio-off smart meter at any time [s.4.2.3(c)].

7.3.2 A new residential customer moving into premises that have an installed smart meter is not allowed to choose (and pay the fees for) a radio-off smart meter; but an existing residential customer who has a legacy meter in place and who is moving into premises that have an installed smart meter is allowed to choose (and pay the fees for) a radio-off smart meter in the new premises [s.4.2.3(d)].

7.3.3 A new residential customer moving into premises that have an installed smart meter is not allowed to choose (and pay the fees for) a radio-off smart meter; but an existing residential customer with a radio-off meter who is moving into premises that have an installed smart meter is allowed to choose (and pay the fees for) a radio-off smart meter in the new premises [s.4.2.4(b)].

7.3.4 A new or existing residential customer who does not have a legacy meter in place is not allowed to elect to have a radio-off meter in his or her new or existing premises; but a customer who once had a legacy meter in place and whose service was terminated for any reason is allowed to take residential service again with a radio-off meter at either the same premises or new premises [s.4.2.3(e)].

7.3.5 A residential customer with a smart meter who requires a replacement meter is not allowed to have (and pay the fees for) a radio-off replacement; but a residential customer with a radio-off meter that requires replacement is allowed to have a radio-off replacement meter [s.4.2.4(a)].

7.3.6 A residential customer who does not have a radio-off meter in place and who moves to vacated residential premises is not allowed to have a radio-off meter at the vacated residential premises; but a residential customer who is eligible to have a radio-off meter who moves to vacated residential premises is allowed to have a radio-off meter at the vacated premises [s.4.2.4(b)].

7.3.7 A customer who does not have a legacy meter or a radio-off meter in place, whose service is terminated for any reason and whose service is resumed at the same or different premises is not allowed to have a radio-off meter upon the resumption of service; but a customer with a radio-off meter in place whose service is terminated for any reason whatsoever and who again takes residential service at that same or another premises is allowed to have a radio-off meter upon the resumption of service [s.4.2.4(c)].

7.4 Please confirm that Electric Tariff s.4.2.3 (e) means that a residential customer with a legacy meter whose service is terminated for any reason and who later takes residential service at the same or different premises can elect to have a radio-off meter upon resumption of service – even if the customer's election to have a radio-off meter installed occurs many years after the termination of the legacy meter service.

7.4.1 If not confirmed, please explain why not.

7.4.2 If confirmed, what is the rationale for this provision? Was this outcome BC Hydro's intention?

7.4.3 Is a customer to whom Electric Tariff s.4.2.3 (e) applies entitled to the benefit of s.4.2.3.(e) for life?

7.5 Please confirm that Electric Tariff s.4.24 (c) means that a residential customer with a radio-off meter whose service is terminated for any reason and who later takes residential service at the same or different premises can elect to have a radio-off meter upon resumption of service – even if the customer's election to have a radio-off meter installed occurs many years after the original termination of the radio-off meter service.

7.5.1 If not confirmed, please explain why not.

7.5.2 If confirmed, what is the rationale for this provision? Was this outcome BC Hydro's intention?

7.5.3 Is a customer to whom Electric Tariff s.4.2.4 (c) applies entitled to the benefit of s.4.2.4 (c) for life?

7.6 Please confirm that upon the death of a residential customer who has (and is paying fees for) a legacy meter or a radio-off meter in place a new customer taking service at the premises, including a resident in the household of the deceased customer, would be required to take service from a radio-on smart meter. If not confirmed, please explain why, with reference to the provisions of the Electric Tariff.

7.7 Can BC Hydro confirm that a major intention of the design of the legacy and radio-off meter choice program is to phase out legacy meters and to phase out radio-off smart meters over time?

7.7.1 If confirmed, why does the program allow an installed radio-on smart meter to be converted to radio-off status, and why does the

program allow a radio-off smart meter to be installed in new premises?

7.7.2 If not confirmed, what is the intention of the design of the meter choice program?

7.8 Can BC Hydro confirm that a major intention of the design of the meter choice program is to accommodate the interests of residential customers who have refused to allow the installation of a smart meter on their premises specifically because of concerns due to radio transmissions from a smart meter?

7.8.1 If confirmed, why does the program allow a customer to retain a legacy meter rather than allowing a customer to have (and pay the charges for) a radio-off smart meter?

7.8.2 If not confirmed, what is the purpose of the meter choice program?

7.9 Does BC Hydro agree that, on grounds of non-discrimination, eligibility for a radio-off smart meter should available to all BC Hydro residential customers and not only to those customers who prevented installation of smart meter at their premises? If not, why not?

7.10 Does BC Hydro assert that the smart meter choices amendments to the Electric Tariff comply with the requirements of s.59 in terms of not being "unjust, unreasonable, unduly discriminatory or unduly preferential"?

7.10.1 If so, please provide any rationale BC Hydro relies upon for this conclusion in addition to Direction 4.

7.10.2 Does BC Hydro rely on section 3(2) of the *Utilities Commission Act* for the proposition that Direction 4 overrides or otherwise takes precedence over s.59 of the *Utilities Commission Act*?

8.0 Topic: Failed installation of legacy meter
Reference: Exhibit B-1, 2.4 Meter Access – Failed Installations

"A failed installation occurs when BC Hydro or its contractor attends at a customer's premises to install a legacy meter, radio-off meter or smart meter but the installation is not carried out because of either an objection made by a customer or an obstruction." [p.2-8, underline added]

8.1 Under what circumstances would BC Hydro attend at a customer's premises to install a legacy meter?

9.0 Topic: Meaning of radio-off
Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

9.1 Does "deactivated" mean no radio transmissions? If not, please explain.

9.2 Please confirm that the reference to "the home area network" in footnote 13 refers to the ZigBee radio in the smart meter.

9.3 Does the statement that the ZigBee radio in the smart meter is in "quiet mode" mean that the ZigBee radio is not producing any radio transmissions? If not, please explain.

9.4 Please confirm that the reference to "the field area network radio" refers to the radio in the smart meter that communicates (if it is enabled) with the utility via a local area network and a wide area network. If not confirmed, please explain.

9.5 Does the reference to 'turning off' the "field area network radio" mean the same thing as disabling the field area network radio? Do these conditions mean that the field area network radio in the smart meter produces no radio transmissions?

9.6 Please describe how a firmware update to turn off the field area network radio in a smart meter can be accomplished and how it will be accomplished for smart meters that are to be made 'radio-off.'

9.6.1 When a smart meter is to be made radio-off will this be done with a hand-held device communicating with an optical port on the smart meter at the customer's premises?

"Once the radio has been deactivated, the meter will indicate a standard message on the display confirming that the radio has been deactivated." [p.3-14]

9.7 Please confirm that the OpenWay smart meters in question have an LED display that indicates whether or not the field area network radio is 'on' or 'off.' If not confirmed, please explain.

9.8 Please provide a photo of a radio-off smart meter showing the LED display that confirms that the radio is actually off.

10.0 Topic: Commercial customers
Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

10.1 Regarding the referenced letter to commercial customers circa "week of September 16, please confirm that the letter was sent.

10.1.1 Please confirm that it was sent to commercial customers who did not at that time have a smart meter installed.

10.1.2 Was the letter sent only to those commercial customers who did not have a smart meter installed because of customer objection, or was it also sent to commercial customers did not have a smart meter for other reasons?

10.1.3 Please provide a copy of the letter (with customer identification redacted).

10.1.4 Please confirm that the letter informed the commercial customer that legacy meter and radio-off meter options are not available to the commercial customer.

10.1.5 Please quantify how many such letters were sent, how many responses were received, how many responses indicated objection to a smart meter, how many smart meters have been installed at these commercial customers' premises, how many smart meters remain to be installed at these commercial customers' premises, and by what timeframe BC Hydro intends to have smart meters installed at all of these customers' premises.

11.0 Topic: Program principles
Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

11.1 Please confirm that on July 23, 2013, the issued Order C-7-13 on the Application of FortisBC Inc. (FBC) for a Certificate of Public Convenience and Necessity (CPCN) for FBC's Advanced Metering Infrastructure (AMI) Project.

11.2 Please confirm that the Commission's CPCN for FBC's AMI project was subject to the condition that FBC confirm that it would file an application for an opt-out provision by November 1, 2013 based on the following principles ("Commission Radio-Off Principles"):
1. Customers may choose to opt-out of accepting a wireless transmitting meter.
2. Customers who choose to opt-out will be provided with an AMI meter that has the wireless transmit functions disabled. Transmit functions on these meters will remain disabled until the individual chooses to opt back in to the AMI program; in the event that the customer moves to a new property, the opt-out choice will move with the customer.
3. The incremental cost of opting-out of the AMI program will be borne by the individual choosing to opt-out.

11.3 Did BC Hydro consider the Commission's Radio-Off Principles in Order C-7-13 in the course of communicating with the Provincial Government regarding the content of what became Direction 4?

11.3.1 If so, what was the result?

11.3.2 If not, why not?

11.4 Does BC Hydro agree that three major differences between the FBC Radio-Off Meter program and the BC Hydro Meter Choice program are as follows:

11.4.1 The BC Hydro Meter Choice program allows legacy analog meters to remain in place while supplies last; whereas the FBC Radio-Off program requires analog meters to be replaced with radio-off or radio-on smart meters.

11.4.2 The BC Hydro Meter Choice program is designed so that eventually there will be no legacy meters or radio-off meters; whereas the FBC Radio-Off program contemplates radio-off smart meters being available (for a fee) indefinitely.

11.4.3 The BC Hydro Choice program restricts eligibility for a legacy meter or radio-off meter to residential customers who happen to have successfully objected to installation of a smart meter at their current premises; whereas the FBC Radio-Off program is available to any residential customer who chooses to pay the required fees.

12.0 Topic: Theft detection benefits of smart metering infrastructure
Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

12.1 Does BC Hydro agree that short of full implementation of radio-on smart meters the most cost-effective approach to retaining theft-detection benefits is to install radio-off smart meters where necessary due to customer objections and to manually read interval usage data from the radio-off smart meters? If not, why not?

12.1.1 Does BC Hydro agree that a theft detection approach using radio-off smart meters is more cost effective than an approach using combination of legacy meters, radio-off meters and check meters?

12.1 BC Hydro states that "radio-off meters ... record and store the same interval data as smart meters." [p.3-10] Does BC Hydro agree that interval usage data from a radio-off smart meter can be combined with interval usage data from radio-on smart meters to enable the utility to identify unusual losses that may indicate theft? If not, please explain.

12.2 Are all of BC Hydro's legacy meters currently in place analog meters? If not, please explain and quantify.

12.2.1 What number and proportion of BC Hydro's legacy meters currently in place are capable of recording interval usage data that can and would be retrieved manually?

12.3 Does BC Hydro assert that the theft-detection benefits of the smart meter infrastructure program will be fully retained by the use of the proposed additional check meters to compensate for retention of legacy meters?

12.4 Does BC Hydro agree that the ongoing presence of legacy meters potentially jeopardizes the theft-reduction benefits of the smart meter initiative?

12.5 What are BC Hydro's estimates for the numbers of legacy meters and radio-off meters, at April 1, 2014 and December 31, 2015?

12.6 Has BC Hydro considered the effect of the retention of (a) legacy meters and (b) installation of radio-off smart meters on BC Hydro's ability to comply with the smart grid requirement to be able to identify the location of unmetered loads referred to in section 4(1)(a)(iv) of the Smart Meters and Smart Grid Regulation? If so, what conclusions did BC Hydro reach? If not, why not?

13.0 Topic: Smart meter definition in Direction 4
Reference: Exhibit B-1, Appendix B, Direction No. 4 to the BCUC

Section 1 of Direction 4 defines "radio-off meter" and "smart meter" as follows:

> "radio-off meter" means a smart meter adjusted so that the meter's components that transmit data by radio are deactivated;
>
> "smart meter" means a meter that
>
> (a) meets the requirements set out in section 2 of the Smart Meters and Smart Grid Regulation, B.C. Reg. 368/2010, and
>
> (b) has components that transmit data by radio and those components are activated.

13.1 Please confirm that a smart meter has the ZigBee radio de-activated by default.

13.1.1 Please confirm that the ZigBee radio in a smart meter is not activated except at the request of the customer.

13.2 Please confirm that when an ostensible smart meter has the ZigBee radio off by default it cannot be said that the meter's "components that transmit data by radio... are activated."

13.2.1 If so, does it follow that OpenWay meters by default do not meet the definition of "smart meter" in Direction 4? Please explain.

14.0 Topic: Monthly charge
Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

14.1 Please provide a table summarizing the cost-recovery breakdown of the proposed installation and on-going charges for the legacy meter and radio-off meter service.

14.2 Please indicate what proportion of the proposed monthly charges for legacy meter and radio-off meter service is due to manual meter reading costs.

14.3 Does BC Hydro agree that the cost-recovery rationale for the ongoing charges for legacy meter and radio-off meter service would be conveyed more effectively if the charges were set on a bi-monthly basis corresponding to bi-monthly manual meter reading?

14.4 What would be the downsides of setting the ongoing charges for legacy and radio-off meters on a bi-monthly basis?

15.0 Topic: Revision of meter choice charges
Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

15.1 Please confirm that on a cost-recovery basis the monthly charges for legacy and radio-off customers would vary considerably depending on the number of customers in each category.

15.2 Please confirm that BC Hydro acknowledges that an accurate estimate of the number of customers who will choose legacy and radio-off service is difficult to make at this time.

15.3 Does BC Hydro intend to review the actual costs and recovered revenue associated with implementing the meter choices program?

15.3.1 If so, how?

15.3.2 If not, why not?

15.4 How, and when, would BC Hydro come to the Commission for approval of changes in the meter choices program charges in the event that costs and revenues do not balance out?

16.0 Topic: Reporting requirements
Reference: none

16.1 In BC Hydro's view, what reporting requirements would be appropriate for the Commission to impose concerning the meter choice program?

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

Rates

3 (1) In setting rates under the Act for the authority, the commission must ensure that the rates allow the authority to collect sufficient revenue in each fiscal year to enable it to recover the following costs from the following customers:

(a) program costs, investigation costs and infrastructure costs from

(i) applicable customers at applicable premises where a legacy meter or radio-off meter is installed, to the extent that the authority requests recovery of any of those costs from these customers, and

(ii) all customers, to the extent that any of those costs are not recovered under subparagraph (i);

(b) from all customers, costs incurred with respect to the installation and operation of, and services related to, smart meters;

(c) failed installation costs from customers at a premises where a failed installation occurred.

"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.1 Please confirm that BC Hydro is seeking Commission approval in this proceeding of the proposed Miscellaneous Charges set out in section 11.3 of the Electric Tariff "black lined" on pages 19 and 20 of 20 of Appendix C. Alternatively, please explain.

RESPONSE:

Confirmed except that the black lined text "Service Connection" is only a name change and BC Hydro is not seeking approval of the $194 charge.

Please refer to the second draft BCUC Order provided at pages 3 and 4 in Appendix D to the Application.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.2 Are all of the proposed Miscellaneous Charges set out in section 11.3 of the Electric Tariff described by subparagraph 3(1)(a)(i) of Direction 4? If not, please explain.

RESPONSE:

No. The new failed installation charge is prescribed by paragraph 3(1)(c) of Direction No. 4, and not by paragraph 3(1)(a)(i). The remainder of the new charges applied for in the Application are prescribed by paragraph 3(1)(a)(i).

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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(ii) all customers, to the extent that any of those costs are not recovered under subparagraph (i);

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"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.2.1 Does BC Hydro assert that the proposed s.11.3 Miscellaneous Charges would allow BC Hydro to recover exclusively "program costs, investigation costs and infrastructure costs from (i) applicable customers at applicable premises where a legacy meter or radio-off meter is installed"? If not, please explain.

RESPONSE:

No. Approval of the new charges applied for in the Application would allow BC Hydro to apply those charges to the applicable customer's bill. To the extent the approved charges do not recover the full extent of "program costs, investigation costs and infrastructure costs" from applicable customers at applicable premises where a legacy meter or radio-off meter is installed, the unrecovered costs will be recorded in the SMI Regulatory Account in accordance with section 3(2) of Direction No. 4 and BCUC Order No. G-166-13.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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(ii) all customers, to the extent that any of those costs are not recovered under subparagraph (i);

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"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.3 In BC Hydro's view, what legal provisions apply to the Commission's consideration of approval of the proposed s.11.3 Miscellaneous Charges?

RESPONSE:

The provisions of Direction No. 4 apply to the consideration of the proposed new charges.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

Rates

3 (1) In setting rates under the Act for the authority, the commission must ensure that the rates allow the authority to collect sufficient revenue in each fiscal year to enable it to recover the following costs from the following customers:

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(i) applicable customers at applicable premises where a legacy meter or radio-off meter is installed, to the extent that the authority requests recovery of any of those costs from these customers, and

(ii) all customers, to the extent that any of those costs are not recovered under subparagraph (i);

(b) from all customers, costs incurred with respect to the installation and operation of, and services related to, smart meters;

(c) failed installation costs from customers at a premises where a failed installation occurred.

"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.4 In BC Hydro's view, does Direction 4, s.3(1)(a)(i) – either generally, or in particular the phrase "to the extent the authority requests recovery" -- mean that the Commission must approve exactly the amount of the Electric Tariff section 11.3 rates for legacy and radio-off services to legacy and radio-off customers for which BC Hydro requests approval?

RESPONSE:

No. Direction No. 4 does not direct the BCUC to approve exactly the amount of the legacy and radio-off meter charges applied for in the Application. However, BC Hydro believes the phrase "to the extent that the authority requests recovery of any of those costs from these customers" means that the BCUC does not have jurisdiction to increase the quantum of the charges applied for in the Application.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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(b) from all customers, costs incurred with respect to the installation and operation of, and services related to, smart meters;

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"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.4.1 In BC Hydro's view, does s.3(1)(a)(i) of Direction 4, or any other legal provision, prevent the Commission from determining that the proposed s.11.3 Miscellaneous Charges would allow BC Hydro to collect more revenue than the corresponding "program costs, investigation costs and infrastructure costs" (as defined)?

RESPONSE:

No.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.4.2 If so, why?

RESPONSE:

Given the response to BCSEA IR 1.1.4.1, this IR is not applicable.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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(b) from all customers, costs incurred with respect to the installation and operation of, and services related to, smart meters;

(c) failed installation costs from customers at a premises where a failed installation occurred.

"For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises." [page 1-2, underline added]

"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.4.3 If not, is the Commission empowered to reduce the s.11.3 Miscellaneous Charges from the amounts proposed by BC Hydro to amounts that the Commission determines would allow BC Hydro to recover no more revenue than the corresponding costs?

RESPONSE:

Yes.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.5 Please explain BC Hydro's statement that "the scope of review relates primarily to determining the quantum of the required charges."

RESPONSE:

The statement is elaborated in the responses to the 1.0 series BCSEA IRs.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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"For those eligible customers who choose the legacy meter option, BC Hydro will leave in place the legacy meter currently installed at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have legacy meters installed at their premises." [pages 1-2 to 1-2, underline added]

"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.5.1 In BC Hydro's view, is the Commission at liberty in this proceeding to allocate recovery of legacy and radio-off costs (as defined) between legacy and radio-off customers under s.3(1)(a)(i) and "all customers" under s.3(1)(a)(ii)?

RESPONSE:

No. Please refer to the response to BCSEA IR 1.1.4.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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(b) from all customers, costs incurred with respect to the installation and operation of, and services related to, smart meters;

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"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.5.2 If so, in BC Hydro's view, what considerations should the Commission take into account in making such an allocation?

RESPONSE:

Given the response to BCSEA IR 1.1.5.1, this IR is not applicable.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

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"...Accordingly, the scope of review relates primarily to determining the quantum of the required charges." [page 1-10]

1.1.5.3 If not, why not?

RESPONSE:

Please refer to the response to BCSEA IR 1.1.4.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.6 Please confirm that it is BC Hydro's position that all "program costs, investigation costs and infrastructure costs" (as defined) would be recovered from legacy and radio-off customers if the proposed s.11.3 Miscellaneous Charges are approved.

RESPONSE:

Not confirmed. In the statement quoted in the preamble to this IR, BC Hydro said that incremental costs "are expected to be" recovered from those customers choosing the option and not from other BC Hydro ratepayers. The Application indicates that forecasts of costs to provide customers with meter options, turn on the assumed values for a number of key variables, and that for a number of these cost elements there are a range of potential outcomes. In proposing the new charges, BC Hydro believes that it has selected reasonable values from these ranges of uncertainty. Actual costs are likely to vary from the forecasts.

Please also refer to the response to CEC IR 1.9.5.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.6.1 Has BC Hydro identified any "program costs, investigation costs and infrastructure costs" (as defined) that it proposes would be recovered from "all customers" under s.3(1)(a)(ii) of Direction 4? If so, please explain.

RESPONSE:

Please refer to the response to CEC IR 1.9.5.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.7 In BC Hydro's view, does s.3(1)(a) preclude the Commission from determining that legacy and radio-off costs (as defined) were not prudently incurred?

RESPONSE:

BC Hydro does not fully understand the question. Pursuant to section 3(1)(a) of Direction No. 4, "program costs, investigation costs and infrastructure costs" are recoverable in rates.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.8 Please confirm that s.3(1)(b) of Direction speaks to "smart meter costs," not to meter choice costs.

RESPONSE:

Section 3(1)(b) of Direction No. 4 refers to "costs incurred with respect to the installation and operation of, and services related to, smart meters".

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.9 In BC Hydro's view, does s.3(1)(b) preclude the Commission from determining that smart meter costs (as defined) were not prudently incurred?

RESPONSE:

BC Hydro does not fully understand the question. Pursuant to section 3(1)(b) of Direction No. 4, "costs incurred with respect to the installation and operation of, and services related to, smart meters" are recoverable in rates. Please also refer to sections 7(1)(j) and 8(1)(b) of the *Clean Energy Act*.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.10 In BC Hydro's view, does s.3(1)(b) preclude the Commission from determining that smart meter costs (as defined) should be allocated differentially to different customer classes in a rate rebalancing proceeding?

RESPONSE:

BC Hydro does not have a position on this at this time.

This question is better asked in a rate rebalancing proceeding where the issue might be before the BCUC for determination.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.11 In BC Hydro's view, does s.3(1)(c) apply only prospectively? That is, in BC Hydro's view, does s.3(1)(c) require the Commission to allow rate recovery regarding failed installation costs only where the "failed installation" (as defined) occurs after the effective date of the amendment of the Electric Tariff required by s.3(3) of Direction 4?

RESPONSE:

By Order No. G-166-13 the BCUC approved the failed installation charge on an interim basis effective as of October 25, 2013. The failed installation charge will apply from October 25, 2013 forward where the criteria for application of the charge, as set out in the BC Hydro Electric Tariff, are met.

1.0 Topic: Electric Tariff s.11.3 proposed Miscellaneous Charges

Reference: Exhibit B-1, Appendix B, Direction 4; Exhibit B-1, Appendix C, Amended Electric Tariff Pages Black-Lined, section 11.3, pages 19-20 of 20; Exhibit B-1, pages 1-2, 1-2, 1-10, 3-28

BC Hydro states: "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers." [p.3-28]

1.1.12 More generally, where a customer has a legacy meter due to the customer's objection to installation of a smart meter and the objection was made at a time prior to the effective date of Order G-166-13, does BC Hydro intend to attempt to recover from the customer the costs related to attendance at the customer's premises to install the smart meter?

RESPONSE:

Please refer to the response to BCSEA IR 1.1.11.

2.0 Topic: Discretion of BC Hydro

Reference: Exhibit B-1, pages 1-1, 1-2

"The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.
Direction No. 4 was issued on September 25, 2013, and provides direction to the BCUC with respect to implementing the Government policy.

Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:..."

1.2.1 Does BC Hydro agree that Direction 4 binds the Commission in various respects but does not directly bind BC Hydro?

RESPONSE:

Yes, however, the orders the BCUC issues pursuant to Direction No. 4 will bind BC Hydro.

2.0 Topic: Discretion of BC Hydro

Reference: Exhibit B-1, pages 1-1, 1-2

"The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option. Direction No. 4 was issued on September 25, 2013, and provides direction to the BCUC with respect to implementing the Government policy.

Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:..."

1.2.2 Please file any document(s), apart from Direction 4, that conveys the Government's requirements or requests to BC Hydro concerning the smart meter choices program.

RESPONSE:

BC Hydro has not received any other requirements or requests from Government in relation to the Meter Choices Program implementation apart from Direction No. 4.

2.0 Topic: Discretion of BC Hydro

Reference: Exhibit B-1, pages 1-1, 1-2

"The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option. Direction No. 4 was issued on September 25, 2013, and provides direction to the BCUC with respect to implementing the Government policy.

Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:..."

1.2.3 Please provide a table listing key elements of the smart meter choice program and indicating for each element whether it is required by Direction 4, required by some other Government instruction, or the outcome of BC Hydro's exercise of its own discretion.

RESPONSE:

Each of the main elements of the Meter Choices Program is required by Direction No. 4 or the BCUC orders issued pursuant to Direction No. 4.

2.0 Topic: Discretion of BC Hydro

Reference: Exhibit B-1, pages 1-1, 1-2

"The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option. Direction No. 4 was issued on September 25, 2013, and provides direction to the BCUC with respect to implementing the Government policy.

Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:..."

1.2.4 What directions or instructions has the Government provided to BC Hydro concerning how BC Hydro is to respond in the event that customers refuse or fail to pay the meter choice program charges?

RESPONSE:

None.

2.0 Topic: Discretion of BC Hydro

Reference: Exhibit B-1, pages 1-1, 1-2

"The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.
Direction No. 4 was issued on September 25, 2013, and provides direction to the BCUC with respect to implementing the Government policy.

Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:..."

1.2.4.1 How will BC Hydro respond in the event that customers refuse or fail to pay the meter choice program charges?

RESPONSE:

The fees for keeping a legacy meter, a radio-off meter and failed installations have been approved on an interim basis and will be added to customer's bills accordingly. Customers who do not pay their bills, either in full or in part, will enter the existing non-payment process and will eventually be disconnected if their account continues to be in arrears. Per the existing non-payment process, customers receive multiple reminders and phone calls prior to disconnection. The degree of contact and time allowed before issuing a disconnection order varies by the customer's credit rating and the amount of the arrears.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

4.2.1. Meter Types

BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.

Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.1 What are the "various reasons" for the 15,000 incomplete smart meter installations?

RESPONSE:

The approximately 15,000 incomplete smart meter installations include meters classified as:

- **Unable to access**
- **Permanent obstruction**
- **Major repairs required**
- **Unsafe or hazardous conditions**
- **Tampering or diversion**
- **Voltage mismatch**
- **Excessive height**

The categories above do not include customer refusals. For example, the permanent obstruction category is intended for those obstructions where the customer has not objected to a smart meter.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

> Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

> **4.2.1. Meter Types**
>
> BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.
>
> Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.2 When does BC Hydro expect to complete all smart meter installations apart from premises where the customer elects a legacy or radio-off meter or is deemed to elect a legacy meter?

RESPONSE:

BC Hydro expects to substantially complete the remaining smart meter installations by the end of June 2014.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

> Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

> **4.2.1. Meter Types**
>
> BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.
>
> Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.3 Please explain fully the proposed treatment of situations where customers do not have an installed smart meter for reasons other than the customer's objection to installation of a smart meter.

RESPONSE:

All residential customers who do not already have a smart meter installed at their premises are eligible to retain the legacy meter or elect to have a radio-off meter installed under this program. These customers have been sent enrolment letters and they will need to indicate their choice.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

4.2.1. Meter Types

BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.

Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.4 How does the existence of some 15,000 incomplete smart meter installations jibe with the requirement in Electric Tariff 4.2.1 that "Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises"?

RESPONSE:

Included in the 15,000 incomplete installations are residential customers with obstructed meters. Those residential customers with obstructed meters, while they have not, to-date, indicated their objection to a smart meter installation, are eligible for the Meter Choices Program.

Those commercial customers included in the 15,000 will have a smart meter installed at their premises.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

4.2.1. Meter Types

BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.

Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.5 Does BC Hydro have authority to allow a legacy meter to remain in operation for a reason not referred to in section 4.2.2? If so, please explain. If not, what is BC Hydro going to do about any as-yet incomplete smart meter installations?

RESPONSE:

Where the conditions set out in section 4.2.2 of the BC Hydro Electric Tariff are not satisfied, BC Hydro will be installing a smart meter.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

> Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

> **4.2.1. Meter Types**
>
> BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.
>
> Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.6 Does section 4.2.2(d) have the effect of causing a customer who has a legacy meter for one of the "various reasons" other than the customer's objection to having smart meter to be deemed as of December 1, 2013 to have elected to retain the existing legacy meter, thereby triggering the requirement that the customer "shall pay the charges for having a Legacy Meter..."?

RESPONSE:

Please refer to the responses to BCSEA IRs 1.3.4 and 1.3.6.2.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

> Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

> **4.2.1. Meter Types**
>
> BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.
>
> Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.6.1 If not, why not?

RESPONSE:

Please refer to the responses to BCSEA IRs 1.3.4 and 1.3.6.2.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

> Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

> **4.2.1. Meter Types**
>
> BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.
>
> Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.6.2 If so, is BC Hydro intending to apply Legacy Meter monthly charges to residential customers who retain a legacy meter for reasons other than the customer's objection to a smart meter?

RESPONSE:

Yes. An eligible residential customer that elects or is deemed to elect to retain the legacy meter at the customer's premises will be charged the legacy meter charge. Objection to the smart meter is not a required criterion for the customer to be eligible for the Meter Choices Program.

3.0 Topic: Incomplete smart meter installations for 'other reasons'

Reference: Exhibit B-1, page 1-1; Appendix F, "Eligible Customer Factsheet"

"In addition, there are about 15,000 smart meter installations that have not been completed for various reasons." [page 1-1]
"Eligible Customer Factsheet" states:

Only residential customers who asked to delay the installation of a smart meter are eligible to make this choice.

The amended Electric Tariff states in part:

4.2.1. Meter Types

BC Hydro's standard meter for measuring Electricity consumption and (if applicable) demand at a Customer's Premises is the Smart Meter. Except as set out in section 4.2.2 in all cases BC Hydro will install a Smart Meter at a Customer's Premises.

Notwithstanding the preceding paragraph, but subject to the conditions specified in section 4.2.2 being satisfied in each case, BC Hydro will permit to remain in operation, install, replace, maintain and service Legacy Meters and Radio-off Meters at a Residential Service Customer's Premises for the periods specified in sections 4.2.3 and 4.2.4.

1.3.7 The "Eligible Customer Factsheet" says that "Only residential customers who asked to delay the installation of a smart meter are eligible to make the choice [to retain a legacy meter or to have a radio-off meter]." Is this provision incorporated in the amendments to the Electric Tariff? If so, please provide a reference to the applicable Tariff provision.

RESPONSE:

The BC Hydro Electric Tariff does not have a specific requirement that the customer "asked to delay the installation of a smart meter", rather section 4.2.2 of the BC Hydro Electric Tariff requires that BC Hydro had not, before the date of the customer's election or deemed election, installed a smart meter at the customer's premises. Note that the initial words of the Eligible Customer Factsheet state that, "if you don't yet have a smart meter at your home you can choose…"

The conditions for retention or installation of legacy meters and radio-off meters are set out in sections 4.2.1 and 4.2.2 of the BC Hydro Electric Tariff. Legacy and radio-off meters may remain in place subject to sections 4.2.3 and 4.2.4 of the BC Hydro Electric Tariff.

4.0 Topic: Eligible Customer Factsheet

Reference: Exhibit B-1, Appendix F, "Eligible Customer Factsheet"

1.4.1 Please identify any provisions of the "Eligible Customer Factsheet" that are not implemented in the amended Electric Tariff.

RESPONSE:

Some of the information in the Eligible Customer Factsheet is not included in the BC Hydro Electric Tariff because it is the subject of BCUC Orders (e.g., the effective date the charges will be added to the bill) or because it is not appropriate for a tariff (e.g., information regarding BCUC and BC Hydro processes). The factsheet provides information in a question and answer format, which is not appropriate for a tariff document. Accordingly, the questions in the factsheet are not reflected in the BC Hydro Electric Tariff.

The substantive rights and obligations of BC Hydro and the customer reflected in the factsheet are implemented in the BC Hydro Electric Tariff.

5.0 Topic: Order requested

Reference: Exhibit B-1, Appendix D, Draft Order; Exhibit A-1, Order G-166-13

1.5.1 Please provide a table showing (a) Electric Tariff amendments (approved) and other Commission orders per Order G-166-13 and (b) requested Electric Tariff amendments and Commission orders. (The intention is to understand exactly what Commission decisions BC Hydro is seeking that have not already been made in Order G-166-13.)

RESPONSE:

The Orders that BC Hydro is seeking in the Application, which have not already been granted pursuant to BCUC Order No. G-166-13, are set out in the second draft BCUC Order provided at pages 3 and 4 in Appendix D to the Application.

6.0 Topic: Smart meter refusals

Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.**"**

1.6.1 What is the current status of the number of smart meter refusals?

RESPONSE:

The Meter Choices Program enrolment period is underway and will end on December 1, 2013. Rather than provide mid-enrolment-period data with its response to Round 1 IRs, BC Hydro believes it would be more efficient to provide data in relation to Meter Choices Program enrolment with its response to Round 2 IRs, which are scheduled to be filed after the enrolment period ends. Accordingly, BC Hydro will provide Meter Choices Program enrolment data with its response to Round 2 IRs.

6.0 Topic: Smart meter refusals

Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.**"**

1.6.2 Please provide the number of smart meter refusals as a percentage of customers by rate class and by geographic sub-area of BC Hydro's service territory.

RESPONSE:

Please refer to the response to BCUC IR 1.2.1.

6.0 Topic: Smart meter refusals

Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.**"**

1.6.3 Of the 1.9 million smart meter installations, how many are 'radio-on' and how many are 'radio-off'?

RESPONSE:

All smart meters installed to date have the FAN radio transmitter turned on. No radio-off meters have been installed to date.

6.0 Topic: Smart meter refusals

Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.**"**

1.6.3.1 If any installed smart meters are 'radio-off,' please provide the reasons and the corresponding numbers.

RESPONSE:

All smart meters installed to date have the FAN radio transmitter turned on. No radio-off meters have been installed to date.

6.0 Topic: Smart meter refusals

Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.**"**

1.6.3.2 How many installed smart meters are 'radio-off' due at the request of the particular customer?

RESPONSE:

All smart meters installed to date have the FAN radio transmitter turned on. No radio-off meters have been installed to date.

6.0 Topic: Smart meter refusals

Reference: Exhibit B-1, p.1-1; 2.3.3.2 Reminder Letters to Eligible Customers

"Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.**"**

1.6.4 With reference to "2.3.3.2 Reminder Letters to Eligible Customers," please quantify how many such letters were sent, how many responses were received, how many responses indicated objection to a smart meter, how many smart meters have been installed at these customers' premises, and how many smart meters remain to be installed at these customers' premises.

RESPONSE:

The Meter Choices Program enrolment period is underway and will end on December 1, 2013. Rather than provide mid-enrolment period data with its response to Round 1 IRs, BC Hydro believes it would be more efficient to provide data in relation to Meter Choices Program enrolment with its response to Round 2 IRs, which are scheduled to be filed after the enrolment period ends. Accordingly, BC Hydro will provide Meter Choices Program enrolment data with its response to Round 2 IRs.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.1 Please confirm that the meter choice program is not available to a residential customer who has a smart meter currently installed under the following circumstances:

1.7.1.1 the customer respected BC Hydro's legal authority to replace the legacy meter with a smart meter and therefore did not obstruct or otherwise refuse to allow BC Hydro to install a smart meter at the customer's premises,

RESPONSE:

If a smart meter has already been installed at the customer's premises, the customer is not eligible to have that smart meter replaced with a legacy meter or radio-off meter.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.1 Please confirm that the meter choice program is not available to a residential customer who has a smart meter currently installed under the following circumstances:

1.7.1.2 the customer was unaware that BC Hydro intended to replace the legacy meter with a smart meter and therefore did not obstruct or otherwise refuse to allow BC Hydro to install a smart meter at the customer's premises, or

RESPONSE:

Please refer to the response to BCSEA IR 1.7.1.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter3** or

3. the existing **legacy meter**4 can remain installed at the premises"

1.7.1 Please confirm that the meter choice program is not available to a residential customer who has a smart meter currently installed under the following circumstances:

1.7.1.3 the customer was persuaded by BC Hydro to allow the legacy meter to be replaced by a smart meter at the customer's premises and therefore did not obstruct or otherwise refuse to allow BC Hydro to install a smart meter at the customer's premises.

RESPONSE:

Please refer to the response to BCSEA IR 1.7.1.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.2 In its communications with customers about the impending installation of smart meters did BC Hydro or Corix inform customers that if they successfully obstructed or refused to allow BC Hydro to install a smart meter they would be eligible to choose to retain their legacy meter or have a radio-off smart meter?

RESPONSE:

No. During mass deployment, BC Hydro was not aware that Government would subsequently announce the Meter Choices Program in summer 2013.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter3** or

3. the existing **legacy meter**4 can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.1 A residential customer with an installed smart meter is <u>not</u> allowed to choose (and pay the fees for) a radio-off smart meter; but a residential customer with a legacy meter <u>is</u> allowed to choose (and pay the fees for) a radio-off smart meter at any time [s.4.2.3(c)].

RESPONSE:

As noted in Chapter 1 of the Application, the Government has decided that BC Hydro will offer meter choices to certain customers and not to others. Direction No. 4 to the BCUC provides direction to the BCUC with respect to implementing the Government policy. Among other things, Direction No. 4 prescribes eligibility for the legacy and radio-off meter options and the conditions under which legacy and radio-off meters may remain in place.

Note that the Meter Choices Program is not "proposed" as suggested in the question; the program is already well into implementation in accordance with Direction No. 4 and BCUC Order No. G-166-13.

Please also refer to the response to BCSEA IR 1.5.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter3** or

3. the existing **legacy meter**4 can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.2 A new residential customer moving into premises that have an installed smart meter is not allowed to choose (and pay the fees for) a radio-off smart meter; but an existing residential customer who has a legacy meter in place and who is moving into premises that have an installed smart meter is allowed to choose (and pay the fees for) a radio-off smart meter in the new premises [s.4.2.3(d)].

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.3 A <u>new</u> residential customer moving into premises that have an installed smart meter is <u>not</u> allowed to choose (and pay the fees for) a radio-off smart meter; but an existing residential customer with a radio-off meter who is moving into premises that have an installed smart meter <u>is</u> allowed to choose (and pay the fees for) a radio-off smart meter in the new premises [s.4.2.4(b)].

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter3** or

3. the existing **legacy meter**4 can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.4 A new or existing residential customer who does not have a legacy meter in place is not allowed to elect to have a radio-off meter in his or her new or existing premises; but a customer who once had a legacy meter in place and whose service was terminated for any reason is allowed to take residential service again with a radio-off meter at either the same premises or new premises [s.4.2.3(e)].

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter3** or

3. the existing **legacy meter**4 can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.5 A residential customer with a smart meter who requires a replacement meter is not allowed to have (and pay the fees for) a radio-off replacement; but a residential customer with a radio-off meter that requires replacement is allowed to have a radio-off replacement meter [s.4.2.4(a)].

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.6 A residential customer who does not have a radio-off meter in place and who moves to vacated residential premises is not allowed to have a radio-off meter at the vacated residential premises; but a residential customer who is eligible to have a radio-off meter who moves to vacated residential premises is allowed to have a radio-off meter at the vacated premises [s.4.2.4(b)].

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter3** or

3. the existing **legacy meter**4 can remain installed at the premises"

1.7.3 What rationales, other than Direction 4, do BC Hydro offer for the following aspects of the proposed smart meter choice program:

1.7.3.7 A customer who does not have a legacy meter or a radio-off meter in place, whose service is terminated for any reason and whose service is resumed at the same or different premises is not allowed to have a radio-off meter upon the resumption of service; but a customer with a radio-off meter in place whose service is terminated for any reason whatsoever and who again takes residential service at that same or another premises is allowed to have a radio-off meter upon the resumption of service [s.4.2.4(c)].

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.4 Please confirm that Electric Tariff s.4.2.3 (e) means that a residential customer with a legacy meter whose service is terminated for any reason and who later takes residential service at the same or different premises can elect to have a radio-off meter upon resumption of service – even if the customer's election to have a radio-off meter installed occurs many years after the termination of the legacy meter service.

RESPONSE:

The proposition in the question is generally confirmed, however, BC Hydro has not yet developed a business practice for the scenario where the customer's election to have a radio-off meter installed occurs many years after the initial termination of service.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.4.1 If not confirmed, please explain why not.

RESPONSE:

Please refer to the response to BCSEA IR 1.7.4.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.4.2 If confirmed, what is the rationale for this provision? Was this outcome BC Hydro's intention?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.4.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.4.3 Is a customer to whom Electric Tariff s.4.2.3 (e) applies entitled to the benefit of s.4.2.3.(e) for life?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.4.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.5 Please confirm that Electric Tariff s.4.24 (c) means that a residential customer with a radio-off meter whose service is terminated for any reason and who later takes residential service at the same or different premises can elect to have a radio-off meter upon resumption of service – even if the customer's election to have a radio-off meter installed occurs many years after the original termination of the radio-off meter service.

RESPONSE:

The proposition in the question is generally confirmed, however, BC Hydro has not yet developed a business practice for the scenario where the customer's election to have a radio-off meter installed occurs many years after the initial termination of service.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.5.1 If not confirmed, please explain why not.

RESPONSE:

Please refer to the response to BCSEA IR 1.7.5.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.5.2 If confirmed, what is the rationale for this provision? Was this outcome BC Hydro's intention?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.5.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.5.3 Is a customer to whom Electric Tariff s.4.2.4 (c) applies entitled to the benefit of s.4.2.4 (c) for life?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.5.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.6 Please confirm that upon the death of a residential customer who has (and is paying fees for) a legacy meter or a radio-off meter in place a new customer taking service at the premises, including a resident in the household of the deceased customer, would be required to take service from a radio-on smart meter. If not confirmed, please explain why, with reference to the provisions of the Electric Tariff.

RESPONSE:

The BC Hydro Electric Tariff does not speak to the transfer of account status upon the death of any account holder. Upon the death of a residential customer who has a legacy meter or a radio-off meter in place, if a new customer takes service at the premises, the new customer would be required to take services from a radio-on smart meter with one exception. If the deceased account holder is survived by their spouse who resides at the premise that surviving spouse would be eligible to retain the current meter type.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.7 Can BC Hydro confirm that a major intention of the design of the legacy and radio-off meter choice program is to phase out legacy meters and to phase out radio-off smart meters over time?

RESPONSE:

BC Hydro is not able to confirm Government's intentions in issuing Direction No. 4. However, BC Hydro confirms that the number of legacy meters and radio-off meters installed at customer premises is likely to decline over time pursuant to the prescribed terms and conditions of the Meter Choices Program.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.7.1 If confirmed, why does the program allow an installed radio-on smart meter to be converted to radio-off status, and why does the program allow a radio-off smart meter to be installed in new premises?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.7.2 If not confirmed, what is the intention of the design of the meter choice program?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.8 Can BC Hydro confirm that a major intention of the design of the meter choice program is to accommodate the interests of residential customers who have refused to allow the installation of a smart meter on their premises specifically because of concerns due to radio transmissions from a smart meter?

RESPONSE:

BC Hydro is not able to confirm Government's intentions in issuing Direction No. 4. However, concern about radio frequency is not a required criterion for the customer to be eligible for the Meter Choices Program.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.8.1 If confirmed, why does the program allow a customer to retain a legacy meter rather than allowing a customer to have (and pay the charges for) a radio-off smart meter?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.8.2 If not confirmed, what is the purpose of the meter choice program?

RESPONSE:

Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.9 Does BC Hydro agree that, on grounds of non-discrimination, eligibility for a radio-off smart meter should available to all BC Hydro residential customers and not only to those customers who prevented installation of smart meter at their premises? If not, why not?

RESPONSE:

Eligibility for the Meter Choices Program is not limited to those customers who "prevented installation of smart meter at their premises". Eligibility is prescribed by Direction No. 4. Please refer to the response to BCSEA IR 1.7.3.1.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.10 Does BC Hydro assert that the smart meter choices amendments to the Electric Tariff comply with the requirements of s.59 in terms of not being "unjust, unreasonable, unduly discriminatory or unduly preferential"?

RESPONSE:

The new provisions in sections 4 and 6 of the BC Hydro Electric Tariff have already been approved and implemented in accordance with Direction No. 4 and BCUC Order No. G-166-13, effective as of October 25, 2013.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.10.1 If so, please provide any rationale BC Hydro relies upon for this conclusion in addition to Direction 4.

RESPONSE:

Given the response to BCSEA IR 1.7.10, this IR is not applicable.

7.0 Topic: Rationales for program features

Reference: Exhibit B-1, page 1-2

"Pursuant to the Government policy, BC Hydro is offering the following meter options to eligible customers that do not have a smart meter installed at their premises:

1. the installation of a standard smart meter

2. the installation of a **radio-off meter**[3] or

3. the existing **legacy meter**[4] can remain installed at the premises"

1.7.10.2 Does BC Hydro rely on section 3(2) of the *Utilities Commission Act* for the proposition that Direction 4 overrides or otherwise takes precedence over s.59 of the *Utilities Commission Act*?

RESPONSE:

Given the response to BCSEA IR 1.7.10, this IR is not applicable.

8.0 Topic: Failed installation of legacy meter

Reference: Exhibit B-1, 2.4 Meter Access – Failed Installations

"A failed installation occurs when BC Hydro or its contractor attends at a customer's premises to install a legacy meter, radio-off meter or smart meter but the installation is not carried out because of either an objection made by a customer or an obstruction." [p.2-8, underline added]

1.8.1 Under what circumstances would BC Hydro attend at a customer's premises to install a legacy meter?

RESPONSE:

In accordance with section 4.2.3(b) of the BC Hydro Electric Tariff, if the seal of a legacy meter expires, or the meter ceases to function properly before the seal expiry date, BC Hydro will, so long as it has a suitable legacy meter in its meter inventory available for installation, install a replacement legacy meter at the customer's premises.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.1 Does "deactivated" mean no radio transmissions? If not, please explain.

RESPONSE:

Confirmed. Once an Itron OpenWay meter is adjusted so that the meter's components that transmit data by radio are deactivated, there will be no radio transmissions from the meter.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.2 Please confirm that the reference to "the home area network" in footnote 13 refers to the ZigBee radio in the smart meter.

RESPONSE:

Confirmed. The home area network radio refers to the 2.4 GHz radio in BC Hydro's Itron OpenWay meter that uses the ZigBee protocol. Please note once the meter's firmware is updated to radio-off, the home area network radio will also be turned off instead of being in "quiet mode."

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.3 Does the statement that the ZigBee radio in the smart meter is in "quiet mode" mean that the ZigBee radio is not producing any radio transmissions? If not, please explain.

RESPONSE:

In a standard smart meter, the home area network (HAN) is in "quiet mode" and will respond to a compatible device attempting to pair itself with the HAN radio. For a radio-off, the HAN radio is completely disabled and will not respond even when a compatible device is nearby and attempts to connect.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.4 Please confirm that the reference to "the field area network radio" refers to the radio in the smart meter that communicates (if it is enabled) with the utility via a local area network and a wide area network. If not confirmed, please explain.

RESPONSE:

Confirmed.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.5 Does the reference to 'turning off' the "field area network radio" mean the same thing as disabling the field area network radio? Do these conditions mean that the field area network radio in the smart meter produces no radio transmissions?

RESPONSE:

Yes, turning off the radio is the same as disabling the radio. A radio-off meter will not produce any radio transmissions.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.6 Please describe how a firmware update to turn off the field area network radio in a smart meter can be accomplished and how it will be accomplished for smart meters that are to be made 'radio-off.'

RESPONSE:

For the majority of radio-off meters, BC Hydro will be updating the firmware and the associated configuration change prior to travelling to a customer premises. The configuration change is a two-step process to turn off the field area network radio and the home area network radio. It is more efficient to perform the updates at a BC Hydro facility rather than in-field at the customer's premises.

While BC Hydro can update the firmware and the associated configuration change in-field, the meter will need to be powered and as a result, must be installed on a customer premises while updating (which takes approximately 25 minutes). For these reasons, BC Hydro believes processing the meter to be radio-off before installing the meter at a customer premises is preferable to in-field configuration changes. Additional details on the firmware and radio-off configuration are proprietary from Itron and BC Hydro has no further technical knowledge on the exact programming of the firmware.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated.[13]"

"[13] All OpenWay meters are installed with the home area network in "quiet mode" and remain that way until the customer requests pairing with an in-home device. A firmware update is needed to turn off the field area network radio."

1.9.6.1 When a smart meter is to be made radio-off will this be done with a hand-held device communicating with an optical port on the smart meter at the customer's premises?

RESPONSE:

Please refer to the response to BCSEA IR 1.9.6.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"Once the radio has been deactivated, the meter will indicate a standard message on the display confirming that the radio has been deactivated." [p.3-14]

1.9.7 Please confirm that the OpenWay smart meters in question have an LED display that indicates whether or not the field area network radio is 'on' or 'off.' If not confirmed, please explain.

RESPONSE:

Confirmed.

9.0 Topic: Meaning of radio-off

Reference: Exhibit B-1, 2.3.1 Overview of Program

"Once the radio has been deactivated, the meter will indicate a standard message on the display confirming that the radio has been deactivated." [p.3-14]

1.9.8 Please provide a photo of a radio-off smart meter showing the LED display that confirms that the radio is actually off.

RESPONSE:

Please see image below.

Please note the words displayed are embedded in the existing Itron firmware and may be subject to change.

10.0 Topic: Commercial customers

Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

1.10.1 Regarding the referenced letter to commercial customers circa "week of September 16, please confirm that the letter was sent.

RESPONSE:

Confirmed.

10.0 Topic: Commercial customers

Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

1.10.1.1 Please confirm that it was sent to commercial customers who did not at that time have a smart meter installed.

RESPONSE:

Confirmed.

10.0 Topic: Commercial customers

Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

1.10.1.2 Was the letter sent only to those commercial customers who did not have a smart meter installed because of customer objection, or was it also sent to commercial customers did not have a smart meter for other reasons?

RESPONSE:

BC Hydro has sent the non-eligible notification letter to all commercial customers who still have a legacy meter.

10.0 Topic: Commercial customers

Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

1.10.1.3 Please provide a copy of the letter (with customer identification redacted).

RESPONSE:

A copy of the commercial customer non-eligible notification letter has been included in the Application as Appendix G.

10.0 Topic: Commercial customers

Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

1.10.1.4 Please confirm that the letter informed the commercial customer that legacy meter and radio-off meter options are not available to the commercial customer.

RESPONSE:

Confirmed.

10.0 Topic: Commercial customers

Reference: Exhibit B-1, Table 2-2, Customer Notification and Program Enrolment – September 2, 2013 to December 1, 2013

Week of September 16	Letter to commercial customers

1.10.1.5 Please quantify how many such letters were sent, how many responses were received, how many responses indicated objection to a smart meter, how many smart meters have been installed at these commercial customers' premises, how many smart meters remain to be installed at these commercial customers' premises, and by what timeframe BC Hydro intends to have smart meters installed at all of these customers' premises.

RESPONSE:

On September 17, 2013, 7,097 commercial customer letters were sent. The letter provides notice of non-eligibility and did not ask for a response.

Since then, 2,035 smart meters were installed for commercial customers, through to November 18, 2013.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.1 Please confirm that on July 23, 2013, the issued Order C-7-13 on the Application of FortisBC Inc. (FBC) for a Certificate of Public Convenience and Necessity (CPCN) for FBC's Advanced Metering Infrastructure (AMI) Project.

RESPONSE:

Confirmed.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.2 Please confirm that the Commission's CPCN for FBC's AMI project was subject to the condition that FBC confirm that it would file an application for an opt-out provision by November 1, 2013 based on the following principles ("Commission Radio-Off Principles"):
1. Customers may choose to opt-out of accepting a wireless transmitting meter.
2. Customers who choose to opt-out will be provided with an AMI meter that has the wireless transmit functions disabled. Transmit functions on these meters will remain disabled until the individual chooses to opt back in to the AMI program; in the event that the customer moves to a new property, the opt-out choice will move with the customer.
3. The incremental cost of opting-out of the AMI program will be borne by the individual choosing to opt-out.

RESPONSE:

Confirmed.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.3 Did BC Hydro consider the Commission's Radio-Off Principles in Order C-7-13 in the course of communicating with the Provincial Government regarding the content of what became Direction 4?

RESPONSE:

Any input BC Hydro might have had into the development of Direction No. 4 to the BCUC would be subject to Cabinet privilege, and could not be disclosed.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.3.1 If so, what was the result?

RESPONSE:

Please refer to the response to BCSEA IR 1.11.3.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.3.2 If not, why not?

RESPONSE:

Please refer to the response to BCSEA IR 1.11.3.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.4 Does BC Hydro agree that three major differences between the FBC Radio-Off Meter program and the BC Hydro Meter Choice program are as follows:

RESPONSE:

Please refer to the responses in BCSEA IRs 1.11.4.1, 1.11.4.2 and 1.11.4.3.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.4.1 The BC Hydro Meter Choice program allows legacy analog meters to remain in place while supplies last; whereas the FBC Radio-Off program requires analog meters to be replaced with radio-off or radio-on smart meters.

RESPONSE:

Yes.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.4.2 The BC Hydro Meter Choice program is designed so that eventually there will be no legacy meters or radio-off meters; whereas the FBC Radio-Off program contemplates radio-off smart meters being available (for a fee) indefinitely.

RESPONSE:

BC Hydro is not able to confirm Government's intentions in issuing Direction No. 4. However, BC Hydro confirms that the number of legacy meters and radio-off meters installed at customer premises will decline over time pursuant to the prescribed terms and conditions of the Meter Choices Program. BC Hydro does not know whether FortisBC will offer radio-off meters indefinitely.

11.0 Topic: Program principles

Reference: Commission Order C-7-13, FortisBC Advanced Metering Infrastructure CPCN Decision

1.11.4.3 The BC Hydro Choice program restricts eligibility for a legacy meter or radio-off meter to residential customers who happen to have successfully objected to installation of a smart meter at their current premises; whereas the FBC Radio-Off program is available to any residential customer who chooses to pay the required fees.

RESPONSE:

Eligibility for the BC Hydro Meter Choices Program is not limited to those customers who "happen to have successfully objected to installation of a smart meter at their current premises". Eligibility is prescribed by Direction No. 4. Refer to sections 4.2.1 and 4.2.2 of the BC Hydro Electric Tariff. BC Hydro understands that eligibility for the FortisBC program has not yet been determined by the BCUC.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.1 Does BC Hydro agree that short of full implementation of radio-on smart meters the most cost-effective approach to retaining theft-detection benefits is to install radio-off smart meters where necessary due to customer objections and to manually read interval usage data from the radio-off smart meters? If not, why not?

RESPONSE:

Agreed. Meter data downloaded bi-monthly includes all interval consumption data and other events including tamper and outage detection. This data is not available with legacy meters, necessitating the addition of field investigation resources to mitigate the impact associated with the ongoing presence of legacy meters on the system.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.1.1 Does BC Hydro agree that a theft detection approach using radio-off smart meters is more cost effective than an approach using combination of legacy meters, radio-off meters and check meters?

RESPONSE:

Agreed. Please also refer to the response to BCSEA IR 1.12.1.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.2 BC Hydro states that "radio-off meters ... record and store the same interval data as smart meters." [p.3-10] Does BC Hydro agree that interval usage data from a radio-off smart meter can be combined with interval usage data from radio-on smart meters to enable the utility to identify unusual losses that may indicate theft? If not, please explain.

RESPONSE:

Agreed. The interval data from radio-off meters can be combined with the interval data from smart meters for the purposes of theft detection, provided the radio-off data is collected a minimum of every two months. Please also refer to the response to BCUC IR 1.9.2.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.3 Are all of BC Hydro's legacy meters currently in place analog meters? If not, please explain and quantify.

RESPONSE:

Legacy meters remaining in service are both digital and analog meters. For residential accounts with legacy meters, approximately 11,000 are digital meters, and the remaining 56,000 are analog meters.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.3.1 What number and proportion of BC Hydro's legacy meters currently in place are capable of recording interval usage data that can and would be retrieved manually?

RESPONSE:

There are none.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.4 Does BC Hydro assert that the theft-detection benefits of the smart meter infrastructure program will be fully retained by the use of the proposed additional check meters to compensate for retention of legacy meters?

RESPONSE:

Please refer to the response to CEC IR 1.29.2.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.5 Does BC Hydro agree that the ongoing presence of legacy meters potentially jeopardizes the theft-reduction benefits of the smart meter initiative?

RESPONSE:

Yes, please refer to the response to CEC IR 1.29.2.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.6 What are BC Hydro's estimates for the numbers of legacy meters and radio-off meters, at April 1, 2014 and December 31, 2015?

RESPONSE:

BC Hydro does not have the requested information. Please refer to the response to BCUC IR 1.6.5.1.

12.0 Topic: Theft detection benefits of smart metering infrastructure

Reference: Exhibit B-1,

"Since theft detection relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles), legacy meters remaining in the field will reduce the accuracy of the electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams."

1.12.7 Has BC Hydro considered the effect of the retention of (a) legacy meters and (b) installation of radio-off smart meters on BC Hydro's ability to comply with the smart grid requirement to be able to identify the location of unmetered loads referred to in section 4(1)(a)(iv) of the Smart Meters and Smart Grid Regulation? If so, what conclusions did BC Hydro reach? If not, why not?

RESPONSE:

Yes, BC Hydro has considered the issue identified in the question. The issue is discussed in section 3.4.1.4 of the Application.

13.0 Topic: Smart meter definition in Direction 4

Reference: Exhibit B-1, Appendix B, Direction No. 4 to the BCUC

Section 1 of Direction 4 defines "radio-off meter" and "smart meter" as follows:

> "radio-off meter" means a smart meter adjusted so that the meter's components that transmit data by radio are deactivated;
>
> "smart meter" means a meter that
>
> (a) meets the requirements set out in section 2 of the Smart Meters and Smart Grid Regulation, B.C. Reg. 368/2010, and
>
> (b) has components that transmit data by radio and those components are activated.

1.13.1 Please confirm that a smart meter has the ZigBee radio de-activated by default.

RESPONSE:

Not confirmed. The home area network radio is in "quiet mode" by default for the standard smart meter. For the radio-off meter, the home area network radio is turned off (i.e., de-activated).

Please refer to the response to BCSEA IR 1.9.3 for additional information regarding home area network quiet mode.

13.0 Topic: Smart meter definition in Direction 4

Reference: Exhibit B-1, Appendix B, Direction No. 4 to the BCUC

Section 1 of Direction 4 defines "radio-off meter" and "smart meter" as follows:

> "radio-off meter" means a smart meter adjusted so that the meter's components that transmit data by radio are deactivated;
>
> "smart meter" means a meter that
>
> (a) meets the requirements set out in section 2 of the Smart Meters and Smart Grid Regulation, B.C. Reg. 368/2010, and
>
> (b) has components that transmit data by radio and those components are activated.

1.13.1.1 Please confirm that the ZigBee radio in a smart meter is not activated except at the request of the customer.

RESPONSE:

Not confirmed. As described in the response to BCSEA IR 1.9.3, for a standard smart meter, the home area network radio is in "quiet mode" and will respond to a device attempting to pair itself with the radio. The pairing process will require BC Hydro to authorize the pairing and that will only happen upon customer request.

For a radio-off meter, the home area network radio is turned off so it cannot respond to any devices attempting to pair with it. The home area network radio in radio-off meter will not send any radio signals.

13.0 Topic: Smart meter definition in Direction 4

Reference: Exhibit B-1, Appendix B, Direction No. 4 to the BCUC

Section 1 of Direction 4 defines "radio-off meter" and "smart meter" as follows:

> "radio-off meter" means a smart meter adjusted so that the meter's components that transmit data by radio are deactivated;
>
> "smart meter" means a meter that
>
> (a) meets the requirements set out in section 2 of the Smart Meters and Smart Grid Regulation, B.C. Reg. 368/2010, and
>
> (b) has components that transmit data by radio and those components are activated.

1.13.2 Please confirm that when an ostensible smart meter has the ZigBee radio off by default it cannot be said that the meter's "components that transmit data by radio... are activated."

RESPONSE:

Not confirmed.

13.0 Topic: Smart meter definition in Direction 4

Reference: Exhibit B-1, Appendix B, Direction No. 4 to the BCUC

Section 1 of Direction 4 defines "radio-off meter" and "smart meter" as follows:

> "radio-off meter" means a smart meter adjusted so that the meter's components that transmit data by radio are deactivated;
>
> "smart meter" means a meter that
>
> (a) meets the requirements set out in section 2 of the Smart Meters and Smart Grid Regulation, B.C. Reg. 368/2010, and
>
> (b) has components that transmit data by radio and those components are activated.

1.13.2.1 If so, does it follow that OpenWay meters by default do not meet the definition of "smart meter" in Direction 4? Please explain.

RESPONSE:

No. The OpenWay meters BC Hydro has purchased from Itron are delivered with the 2.4 GHz radio in quiet mode and the 900 MHz radio activated. Please refer to the response to BCSEA IR 1.13.1.1.

14.0 Topic: Monthly charge
Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.14.1 Please provide a table summarizing the cost-recovery breakdown of the proposed installation and on-going charges for the legacy meter and radio-off meter service.

RESPONSE:

The cost components of the charges for the radio-off option and the legacy meter option are provided in Table 3-16 (radio-off option) and Table 3-17 (legacy meter option) of the Application.

14.0 Topic: Monthly charge
Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.14.2 Please indicate what proportion of the proposed monthly charges for legacy meter and radio-off meter service is due to manual meter reading costs.

RESPONSE:

For the radio-off meter option, costs for manual meter reading are about 76 per cent of total monthly costs. For the legacy meter option, manual meter reading costs are about 39 per cent of total monthly costs.

14.0 Topic: Monthly charge
Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.14.3 Does BC Hydro agree that the cost-recovery rationale for the ongoing charges for legacy meter and radio-off meter service would be conveyed more effectively if the charges were set on a bi-monthly basis corresponding to bi-monthly manual meter reading?

RESPONSE:

Not agreed. Although BC Hydro is proposing bi-monthly manual meter reads, as implied by the response to BCSEA IR 1.14.2 there are other costs included in the total monthly cost that are incurred more frequently than on a bi-monthly basis (i.e., IT maintenance, field investigation, capital related costs).

14.0 Topic: Monthly charge
Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.14.4 What would be the downsides of setting the ongoing charges for legacy and radio-off meters on a bi-monthly basis?

RESPONSE:

Whether the monthly charges are set on a per-month or per two-month basis makes no difference to how the charges are presented on the bill. The bill will show the total charge for having a legacy or radio-off meter installed on the premises.

15.0 Topic: Revision of meter choice charges

Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.15.1 Please confirm that on a cost-recovery basis the monthly charges for legacy and radio-off customers would vary considerably depending on the number of customers in each category.

RESPONSE:

Confirmed.

15.0 Topic: Revision of meter choice charges

Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.15.2 Please confirm that BC Hydro acknowledges that an accurate estimate of the number of customers who will choose legacy and radio-off service is difficult to make at this time.

RESPONSE:

Confirmed.

15.0 Topic: Revision of meter choice charges

Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.15.3 Does BC Hydro intend to review the actual costs and recovered revenue associated with implementing the meter choices program?

RESPONSE:

BC Hydro will track and review actual costs and revenues for the Meter Choices Program.

15.0 Topic: **Revision of meter choice charges**

Reference: **Exhibit B-1, Chapter 3, Meter Choices Program -- Costs**

1.15.3.1 If so, how?

RESPONSE:

Accounts for the various Meter Choices Program cost components have been set up in SAP, and any costs incurred will be tracked in these accounts. Revenues will be tracked in Miscellaneous Revenues.

15.0 Topic: Revision of meter choice charges

Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.15.3.2 If not, why not?

RESPONSE:

Please refer to the response to BCSEA IR 1.15.3.

15.0 Topic: Revision of meter choice charges

Reference: Exhibit B-1, Chapter 3, Meter Choices Program -- Costs

1.15.4 How, and when, would BC Hydro come to the Commission for approval of changes in the meter choices program charges in the event that costs and revenues do not balance out?

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.2.

16.0 Topic: Reporting requirements

Reference: none

1.16.1 In BC Hydro's view, what reporting requirements would be appropriate for the Commission to impose concerning the meter choice program?

RESPONSE:

In BC Hydro's view, regular reporting requirements imposed by the BCUC for the Meter Choice Program will not be necessary. The BCUC will have the opportunity to review the Meter Choices Program charges when BC Hydro next seeks BCUC approval to update these charges.

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Josephine M Nadel+
Allison R Kuchta+
James L Carpick+
Patrick J Haberl+
Andre J Beaulieu+ °
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Paul A Brackstone+
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November 6, 2013

VIA ELECTRONIC MAIL

British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Ms. Erica Hamilton, Commission Secretary

Dear Sirs/Mesdames:

Re: British Columbia Hydro and Power Authority ("BC Hydro") Application for Approval of Charges Related to Meter Choices Program

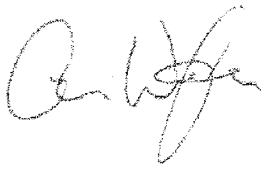
We are counsel for the Commercial Energy Consumers Association of British Columbia (CEC). Attached please find the CEC's first set of Information Requests pertaining to the above-noted matter.

A copy of this letter and attached Information Request has also been forwarded to BC Hydro and registered interveners by e-mail.

Should you have any questions regarding the foregoing, please do not hesitate to contact the writer.

Yours truly,

OWEN BIRD LAW CORPORATION



Christopher P. Weafer
CPW/jlb
cc: CEC
cc: BC Hydro
cc: Registered Interveners

INTERLAW MEMBER OF INTERLAW, AN INTERNATIONAL ASSOCIATION OF INDEPENDENT LAW FIRMS IN MAJOR WORLD CENTRES

COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BC

CEC Information Requests

Application for Approval of Charges Related to Meter Choices Program- BC Hydro

11/6/2013

1. Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1. Please confirm that BC Hydro has attempted to install smart meters at every possible location, and that this was undertaken before October 25th, 2013.

1.1.1. If not confirmed, please identify how many locations were not attempted before October 25th, and why.

1.1.2. If not confirmed, will BC Hydro have made an attempt at every location before December 1, 2013?

1.1.2.1. If not, please explain why not.

1.2. Please confirm that of the 15,000 smart meter installations that have not been completed 'for various reasons' none are related to customer concerns with smart meters.

1.2.1. If not confirmed, please provide the number of smart meters that have been included in this group that are, or could reasonably be anticipated, to stem from customer discomfort with smart meters.

1.2.2. Would BC Hydro agree that the 15,000 customers could include customers who will refuse smart meters and adopt the meter choice program?

1.2.2.1. If not, please explain why not.

1.2.2.2. If so, would BC Hydro agree that the numbers of refusals could be proportionate to the number of refusals that occurred in the general customer base?

1.2.2.3. Please explain why or why not.

1.3. Please provide a high level discussion of the 'various reasons' for which 15,000 installations have not been completed and provide approximate quantification of how many uncompleted installations can be attributed to each reason.

1.4. Does BC Hydro expect to install smart meters in all 15,000 meter locations that have not yet been installed?

1.4.1. If yes, please explain when the remaining 15,000 meter installations are expected to be complete.

1.4.2. If no, please explain with quantification how many of the 15,000 smart meter installations have been deferred and how many will not likely be undertaken at all.

1.4.3. How many of the 15,000 meter installations that have not been completed at the time of Application remained uncompleted as October 25th, 2013?

1.5. What is BC Hydro's current best estimate of the number of customers who will be eligible for and choose or deemed to have chosen to participate in the Meter Choices program?

1.5.1. Please breakdown by 'radio off' and 'legacy meter'.

2. Exhibit B-1. Appendix B Direction No. 4 to the British Columbia Utilities Commission page 3 of 7 and page 5 of 7

(2) The commission must not require the authority to install a legacy meter or radio-off meter for

(a) a non-residential customer, or

(b) an applicable customer, if a smart meter is installed at the applicable premises of the applicable customer on or after the date this direction comes into force.

4.2.2. Conditions for Retention or Installation of Legacy Meters and Radio-off Meters

The conditions that must be satisfied in order for BC Hydro to permit to remain in operation, install, replace, maintain and service Legacy Meters or Radio-off Meters at a Residential Service Customer's Premises are:

(a) the Customer is, as of the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), taking Residential Service at the Customer's Premises;

(b) BC Hydro had not, before the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), installed a Smart Meter at the Customer's Premises, but rather a Legacy Meter remained in place at those Premises as of the date of the Customer's election or deemed election; and

(c) the Customer, during the period beginning September 1, 2013 and ending December 1, 2013, by notice to BC Hydro, elects to retain the Legacy Meter then in place at the Customer's Premises, or to have a Radio-off Meter installed in place of the Legacy Meter; or

(d) the Customer, despite satisfactionof the conditions set out in clauses (a) and (b) has failed to provide notice of election to BC Hydro in accordance with clause (c), in which case the Customer shall be deemed to have electedeffective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed at the Customer's Premises as set out in the Schedule of Standard Charges.

2.1. Please confirm that under no circumstances can an existing customer who already has a smart meter installed at their residential premises elect to have the radio turned off, or to have a Legacy Meter installed.

2.1.1. If not confirmed, please explain the circumstances in which a person who already accepted a smart meter could arrange to have the radio turned off or have a Legacy Meter installed.

2.2. Please confirm that a customer who is new to BC Hydro cannot arrange to have a radio off meter or a Legacy meter installed.

2.3. Please confirm that based Directive No. 4 4.2.2 section (d), '…in which case the Customer shall be deemed to have elected effective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed…'a qualifying customer with a Legacy meter in place as of December 1, 2013

would retain their Legacy Meter unless they explicitly communicate with BC Hydro that they wish to receive a smart meter or a smart meter with the radio off?

2.3.1. If not, please explain why not.

3. Exhibit B-1, Appendix B page 6 of 7

> (b) If the seal of a Legacy Meter expires, or the meter ceases to function properly before the seal expiry date, BC Hydro will, so long as it has a suitable Legacy Meter in its meter inventory available for installation, install a replacement Legacy Meter at the Customer's Premises. A Customer for whom a replacement Legacy Meter has been installed in accordance with the preceding sentence can continue to retain the replacement Legacy Meter for the period specified in clause (a), and any replacement Legacy Meter so installed shall be subject to replacement in accordance with this clause (b) as the occasion arises. For purposes of this section, BC Hydro will only be deemed to have suitable replacement Legacy Meters in its meter inventory if it has existing verified and sealed Legacy Meters in its meter inventory as of the date that a Legacy Meter in place at a Customer's Premises requires replacement, and BC Hydro is under no obligation to repair, rebuild or modify, or re-verify and re-seal, any Legacy Meters that have been removed from service for any reason, nor to purchase or otherwise acquire from any source any Legacy Meters in replenishment of its Legacy Meter inventory.

3.1. When, relative to the seal expiration date, will customers be notified that the seal on their meter either has expired, or will expire?

3.2. Please provide an example of the customer notification that will be sent out prior to the meter being removed.

4. Exhibit B-1, page 1-2

> For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. BC Hydro expects to substantially complete installation of radio-off meters for all such customers by April 2014. Accordingly, BC Hydro is applying for approval to apply these new charges effective April 1, 2014.

4.1. Please provide the rationale for applying for approval to apply the charges after installation is complete for all customers instead of as they are installed on a customer by customer basis?

4.2. Please provide BC Hydro's interpretation of 'substantially complete' quantitatively.

4.3. Would BC Hydro seek to defer the charge if installation was not 'substantially complete' by April 1, 2014? Please explain why or why not.

4.4. Would BC Hydro seek to apply the charge earlier if installation was 'substantially complete' well before April 1, 2014?

4.4.1. Please explain why or why not.

5. Exhibit B-1, page 1-3

> The proposed charges for eligible customers who choose to retain a legacy meter or to have a radio-off meter installed at their premises, are as follows.

	Radio-Off Meter		Legacy Meter
	Existing Meter: Legacy	Existing Meter: Smart[5]	
Initial Charge ($)	100	155	N/A
Monthly Charge ($)	20	20	35

5.1. Please confirm that a customer who currently has a Legacy Meter in place has 4 main options with three possible outcomes with respect to establishing their choice including:

a) Notifying BC Hydro prior to December 1, 2013 that they wish to receive a Radio Off meter, in which case they will receive a Radio Off meter according to BC Hydro's schedule and a $100 charge in April 2014, and a $20 monthly bill charge which will continue thereafter.

b) Doing nothing, in which case BC Hydro will not replace their Legacy Meter until necessary, and they will receive an additional $35 monthly fee commencing December 1, 2013.

c) Notifying BC Hydro that they wish to keep a Legacy Meter, in which case BC Hydro will not replace their Legacy Meter until necessary, and they will receive an additional $35 monthly fee commencing December 1, 2013.

d) Notifying BC Hydro that they wish to accept a Radio On Smart Meter before December 1, 2013, in which case they will receive a Radio On Smart Meter at no additional charge.

5.2. Please provide the total cost of removing a legacy meter and replacing the meter with a radio off meter and include a breakdown of the labour and non-labour charges.

6. Exhibit B-1, page 1-3

> Also pursuant to Direction No. 4, BC Hydro is seeking BCUC approval of a new failed installation charge to recover the costs related to attendance at a customer's premises to install a legacy meter, radio-off meter or smart meter, as applicable, and installation is not carried out because of an objection made by a customer or an obstruction.

6.1. Please confirm that 'install a legacy meter' would only apply in the event of replacement of an existing legacy meter with a meter from inventory, in that BC Hydro is not permitted to install a Legacy Meter where a smart meter has already been installed, pursuant to Direction No. 4.

6.1.1. If not confirmed, please explain all the circumstances under which BC Hydro might be installing a Legacy Meter.

7. Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

7.1. Please provide a copy of the Smart Metering and Infrastructure (SMI) Program Business Case.

7.2. Please confirm that the Smart Metering Program and Smart Grid together will include financial benefits related to:

- Meter Reading Automation,
- Meter sampling,
- Remote Re-connect automation,
- Distribution Asset Optimization,
- Outage Management Efficiencies,
- Continuous Optimization and Load Research,
- Voltage Optimization (Commercial customer sites and Distribution system)
- Theft detection,
- Voluntary time of use rates, and
- Conservation tools.

7.3. Please identify any additional financial benefits that BC Hydro expects to achieve as a result of smart meter deployment.

7.4. Please quantify the anticipated financial benefits that are expected to accrue from each of the areas listed above, and any that BC Hydro has added.

7.5. Please identify any unquantified financial benefits that BC Hydro attributes to the SMI program.

7.6. Please explain if the anticipated financial benefits were assessed on the basis of full deployment of smart meters.

7.6.1. If they were not, please provide the estimated deployment that BC Hydro used to develop its financial benefits predictions.

7.7. Please explain if, and how, the financial benefits of each of these components will be impacted by a lower than full deployment of smart meters, and the continued use of legacy meters.

7.7.1. If there are no financial impacts identified from a lower than full deployment of smart meters, is it BC Hydro's position that they are, or will be able to completely achieve the benefits of the smart meters by undertaking other measures to compensate?

7.7.1.1. If no, please identify which benefits will be lost a result of a lower than full deployment of smart meters, and the continued use of legacy meters.

7.7.2. If the financial benefits will be impacted, please provide a sensitivity analysis of all the financial benefits that will be lost based on the proportion of the 75,000 legacy meters that continue to remain in place and may, or may not be changed out depending upon customer choice.

7.8. Please identify which, if any, financial benefits will be not be achieved by the deployment of radio-off meters instead of the radio on smart meters.

7.8.1. If the financial benefits will be impacted, please provide a quantification of the expected loss.

7.8.1.1. Please provide a sensitivity analysis of the financial benefits that will be lost based on the proportion of the 75,000 Legacy Meters that continue to remain in place.

7.9. Please identify the full suite of non-financial benefits that are attributable to the SMI program.

7.10. Please identify those non-financial benefits that will be compromised by a less than full deployment of smart meters and explain why they might be compromised.

8. Exhibit B-1, page 1-4 and Exhibit A, page 3 of 6

> The Smart Metering System component of the SMI Program includes installation of a new revenue meter for "eligible premises", as that term is defined in the SMSG Regulation, as well as related telecommunications infrastructure and computer hardware and software systems to download and process the electricity consumption data measured by the meters. These new meters must be capable of doing all of the things listed in section 2 of the SMSG Regulation. For example, the new meters must be capable of transmitting and receiving information in digital form. Accordingly, BC Hydro has been installing and putting into operation at eligible

(a) measuring electricity supplied to an eligible premises;

(b) transmitting and receiving information in digital form;

(c) allowing the authority remotely to disconnect and reconnect the supply of electricity to an eligible premises, unless

(i) the point of metering for the eligible premises

(A) is greater than 240 volts,

(B) is greater than 200 amperes, or

(C) is three phase, or

(ii) the eligible premises

(A) has a bottom-connected meter,

(B) has an output or input pulse meter, or

(C) has a meter that measures maximum electricity demand in watts;

(d) recording measurements of electricity, and recording the date and time of the recording, at least as frequently as in 60-minute intervals;

(e) being configured by the authority at a location either remote from or close to the meter;

(f) measuring and recording measurements of electricity generated at the premises and supplied to the electric distribution system;

(g) transmitting information to and receiving information from an in-home feedback device, unless the point of metering for the eligible premises meets any of the criteria set out in paragraph (c) (i) or the eligible premises meets

8.1. Please confirm that legacy meters cannot do any of the functions listed in Section 2 of the SMSG Regulation, except measure electricity supplied to an eligible premise.

8.1.1. If not confirmed, please list and provide an explanation as to which aspects of the SMSG regulations the legacy meters meet.

8.2. Please confirm that Radio Off smart meters meet the requirements of the SMSG regulation.

8.2.1. If not confirmed, please list and provide an explanation as to which aspects of the SMSG regulation the Radio Off smart meters do not meet.

9. Exhibit B-1, page 1-5

(a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

9.1. Please provide BC Hydro's definition of 'program costs'.
9.2. Please provide BC Hydro's definition of 'investigation costs'
9.3. Please provide BC Hydro's definition of 'infrastructure costs'
9.4. Would BC Hydro agree that while the 'program costs, investigation costs and infrastructure cost are defined as being recoverable in the Direction, neither BC Hydro nor the Commission is limited to recovering these types of costs and that other types of costs might be included for recovery.
9.4.1. Please explain why or why not.
9.5. Please identify any other costs directly related to the meter choice program of which BC Hydro is aware and will not recover.
9.6. Would BC Hydro agree that neither BC Hydro nor the Commission is limited to recovering costs, and that it would not be unacceptable for additional charges to be approved that exceed the total costs for the meter choices program.
9.7. Would BC Hydro consider any limitations to efficiencies and/or expected financial benefits as a result of an incomplete deployment of radio-on smart meters to be included in the 'program cost, investigation or infrastructure ' costs to be recovered from those customers with legacy meters and/or radio off meters.
9.7.1. Please confirm that BC Hydro is, in this application, requesting BCUC approval of rates that will recover all of the costs or loss of benefits that BC Hydro anticipates will arise from a less than 100% deployment of radio-on smart meters.
9.7.1.1. If BC Hydro is not seeking to recover all costs or loss of benefits it anticipates, please explain why not and if it would expect to do so in the future.
9.7.2. Please confirm that BC Hydro will seek to recover all the costs in the event that there are additional unforeseen costs or loss of benefits as a result of the less than 100% deployment.
9.7.2.1. If not confirmed, please explain why not.
9.8. Does BC Hydro consider the regulatory costs related to the provision of the Choice program to be an applicable cost for recovery from those customers who choose a legacy meter or radio off meter?
9.8.1. If not, please explain why not.
9.9. Please identify all the types of regulatory activities that BC Hydro expects to undertake as a result of providing the customer Choice program.

10. Exhibit B-1, page 1-7, (with footnote) and Appendix B page 3 of 7

> To comply with the Direction, the BCUC is required to issue an order pursuant to section 3(3) by October 25, 2013.[7]

Pursuant to section 4 of the Regulations Act, Direction No. 4 became effective on the date the Direction was deposited (September 25, 2013). Accordingly, the BCUC must issue the order in accordance with section 3(3) of the Direction by October 25, 2013.

(3) Within 30 days of the date this direction comes into force, the commission must issue an order so that the Electric Tariff of the authority is amended by adding the provisions set out in the Appendix to this direction.

10.1. Please confirm that BCUC Order G-166-13 Electric Tariff Terms and Conditions issued October 9, 2013 fulfills all the requirements of the Direction required to be undertaken by October 25th, 2013 pursuant to sections 3(3) and the requirement to establish a regulatory account pursuant to section 3(2).

10.1.1. If not, please specify any requirements that were not fulfilled.

11. Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

11.1. Has BC Hydro already, or does BC Hydro expect to apply the Failed Installation charge to customers prior to the requested November 29, 2013 BCUC decision date.

11.2. Please confirm or otherwise explain that if the failed installation charge already applied to customers, and was subsequently adjusted upward on a final basis effective October 25, 2013, that BC Hydro would seek to recover the difference from those customers to whom it applies.

11.2.1. If not confirmed, please explain why not.

11.2.2. If not confirmed, would BC Hydro recover its costs from failed installations to the extent that they exceeded the failed installation charges, from all customers?

11.2.2.1. If yes, would these costs be incorporated into the SMI Regulatory account?

11.2.2.2. If not, how would BC Hydro recover these costs?

12. Exhibit B-1, page 1-8

- Approves in accordance with section 3(2) of Direction No. 4, BC Hydro adding to its existing SMI Regulatory Account the program costs, investigation costs and infrastructure costs that are not recovered from eligible customers at premises where a legacy meter or radio off meter is installed, and costs related to smart meters, which are incurred during the period January 1, 2013 to March 31, 2014

12.1. Please confirm that the regulatory costs associated with this proceeding will be recovered from all customers.

12.1.1. If not confirmed, please identify the customer groups from whom the regulatory costs will be recovered.

13. Exhibit B-1, page 2-3

> When a customer requested the smart meter installation at their premises be put on hold, a dedicated customer service representative contacted the customer to answer their questions, and sought agreement to proceed with the meter exchange. These customers were advised that they had the option to relocate the smart meter at their cost, either to another location on their property or to nearby BC Hydro infrastructure.

13.1. How many customers undertook to relocate the smart meter at their cost, either to another location on their property or to nearby BC Hydro infrastructure?

13.2. Does BC Hydro expect these customers to attempt to recover their costs from BC Hydro as a result of the change in policy?

13.2.1. If so, please provide BC Hydro's estimation of the total costs that customers might attempt to recover from BC Hydro.

14. Exhibit B-1, page 2-5

Date	Communications Activity
Week of September 2	Enrolment period begins Bchydro.com communications updates
Week of September 9	Meter Choices letter and factsheet to eligible residential customers
Week of September 16	Letter to commercial customers
September 9 to December 1	Receive customer enrolment forms and send confirmation to customers. Send meter replacement notification to customers request to keep old meter but have expired seals.
Week of October 15 and November 15	Reminder letters sent to eligible customers
December 1	Enrolment period ends

14.1. Please confirm that BC Hydro expects to have a relatively firm estimation of the number of customers who will choose legacy meters and the number who will choose radio off by December 1, 2013.

14.1.1. If not, please explain when BC Hydro expects to have a relatively firm estimation of the customers participating in each aspect of the meter choices program.

14.2. How many letters were sent to commercial customers?

14.3. What proportion of those customers who have refused smart meter service to date have been commercial customers?

15. Exhibit B-1 page 2-6

> An enrolment form, a pre-paid return envelope and a factsheet with more information about the choices is enclosed with the letter. BC Hydro will confirm a customer's choice by letter, email or phone call.

15.1. What was the total cost of the pre-paid return envelopes?

15.2. Will BC Hydro also send pre-paid return enveloped for the Reminder Letter?

16. Exhibit B-1, page 2-7

> If a customer with a legacy meter in place moves to another premises, the customer will not be permitted to have a legacy meter installed at the new premises. The customer may choose to have a radio-off meter installed at the new premises or accept the standard smart meter.

16.1. Please confirm or otherwise explain that even if a customer moves to a premise that had a legacy meter in place, they will not be permitted to keep the legacy meter in the new premises.

17. Exhibit B-1, page 2-7 and Appendix B page 7 of 7

> Eligible customers who choose or are deemed to choose the radio-off meter option will be able to retain this meter indefinitely. If a customer with a radio-off meter in place moves to another premises, the customer may choose to have a radio-off meter installed at the new premises or accept the standard smart meter.

> (c) A Customer with a Radio-off Meter in place whose service is terminated for any reason whatsoever, but who again takes Residential Service at the same or another premises may elect to have either a Smart Meter or a Radio-off Meter installed upon resumption of service.

17.1. Please confirm, or otherwise explain, that customers who choose or are deemed to have the radio-off meter either now, or in the future as a result of having had a legacy meter retired are essentially 'grandfathered'.

17.2. Please explain if the 'grandfathering' would only be attributed to the account holder or if it would be attributed to any person residing in premises with a radio-off meter.

17.2.1. If the 'grandfathering' is attributable only to the account holder, how does BC Hydro intend to address customers, or multiple customers, who reside in a home with a radio-off meter and wish to retain a 'radio-off' meter in the event of a move, but are not the account holder – such as the circumstances that may apply in the case of renters where electricity is included in rent, or in situations such as divorce, separation, or death of the account holder? Please explain BC Hydro's policies with respect to such circumstances.

17.2.2. If the 'grandfathering' is attributable to those people residing in a premise with the radio-off, and wish to retain that option, how will BC Hydro confirm the legitimacy of those requests.

18. Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

18.1. Please confirm that BC Hydro will continue to be installing smart meters throughout the period between December 2013 and April 1, 2014.

18.2. Please confirm that BC Hydro expects to only be able to install 5,000 radio off meters over a period of about 4 months.

18.2.1. If not confirmed, please explain why not.

18.3. Would BC Hydro consider the rate of 1,250 meters/month to be an accurate approximation of the rate at which it expects to be installing radio-off meters?

18.3.1. If not, please explain why not.

18.4. Could BC Hydro expect to install significantly more meters over the same period if there were considerably more radio off customers than anticipated?

18.4.1. Please explain why or why not.

18.4.2. If yes, please provide the maximum number of radio off meters that BC Hydro could reasonably install between December 2, 2013 and April 1, 2014.

18.5. Over how many months did BC Hydro install the 1.8 million smart meters that are distributed throughout its service territory?

18.6. Would BC Hydro agree that installing the radio-off meters under the meter choice program will be much more time consuming at a high level on a per meter installation than the original installation of smart meters has been?

18.6.1. If not, please explain why not.

19. Exhibit B-1, page 3-1

> 9 For eligible customers who choose to retain a legacy meter, the meters will have to
> 10 be read manually at the customer's premises.

19.1. Will customers who retain a legacy meter have the option of reading the meter themselves and reporting the reading to BC Hydro at a regular interval?

19.1.1. Please provide the rationale for why or why not.

20. Exhibit B-1, page 3-2

> 9 BC Hydro considers the proposed charges appropriate for the anticipated initial level
> 10 of participation in the Meter Choices Program, as discussed in the next section. The
> 11 charges have been developed so that the costs incurred to offer these options are
> 12 expected to be recovered from those customers who choose to participate in the
> 13 program, and not from other BC Hydro ratepayers.
>
> 14 Revenues from the new standard charges will be recorded as "Miscellaneous
> 15 Revenue." BC Hydro will monitor both revenues and costs for the program to
> 16 evaluate whether the standard charges are recovering the program costs.

20.1. Will BC Hydro provide updates to the Commission as to whether the standard charges are fully recovering program costs?

20.1.1. If so, please explain the process by which the Commission and interveners will be able to determine if the standard charges are recovering costs and when such processes might occur.

20.1.2. Please confirm that if the standard charges are not recovering costs, that BC Hydro would seek to increase the standard charges to the point that they are fully recovering program costs.

20.1.2.1. If not, please explain why not.

20.1.2.2. If not, please explain if BC Hydro has established any which would trigger a request for an increase in standard charges.

21. Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

21.1. On what basis did BC Hydro predict that there will be between 5,000 and 20,000 program participants?

21.1.1. If BC Hydro selected the estimated opt-out rate based on program participation for other utilities, is BC Hydro aware if these utilities had significant numbers of customers refusing smart meter installation prior to choosing opt out service?

21.1.1.1. If so, please provide any conversion rates BC Hydro is aware of for other utilities in which customers originally refused smart meters and then accepted smart meters once the program was established.

21.1.2. Did BC Hydro conduct any high level sensitivity analysis for 30,000, 40,000, 50,000 or 60,000 customers opting out?

21.1.2.1. If so, please provide the result of such senstivity analysis.

21.2. On what basis did BC Hydro determine that 50% of Meter Choices Program Participants will choose a radio-off meter and 50% will choose a legacy meter?

21.2.1. Please provide any reference information that BC Hydro relied upon in making this determination.

21.2.2. Would BC Hydro agree that a high initial charge could discourage participation in the legacy meter program relative to the radio off program?

21.2.2.1. If not, please explain why not.

22. Exhibit B-1, page 3-3 and page 3-4, Table 3-2

> of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

9 **Table 3-2 Opt-Out Programs for Other Utilities**

Utility	Initial Charge ($)	Monthly Charge ($)	Mass Deployment Status	Participation	
				Number	Percent (%)
Pacific Gas & Electric[1]	75	10	Ongoing	36,000	0.6
San Diego Gas & Electric[1]	75	10	99.6% Complete	1,800	0.2
Central Maine Power[2]	20	11	Ongoing	8,000	1.3
Portland General Electric [2]	251	51	Complete	4	0.0
NV Energy	53	9	Ongoing	7,500[3]	0.5
Hydro Quebec	98	17	Ongoing	402	0.2

1 The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.

2 As of Fall 2012.

3 NV Energy forecast.

22.1. Please provide BC Hydro's views of the relative importance of having a high initial charge or having high monthly charges and identify which factors it believes are more important to customers in choosing to participate in the Meter Choices Program.

22.1.1. Would BC Hydro agree that high initial charges are 'traded off' in a customer's mind vs. higher monthly charges. If not, please explain why not.

22.2. Would BC Hydro agree that a high initial charge is a barrier for a customer to commence participating in the meter choices program?

22.2.1. Please explain why or why not.

22.3. Would BC Hydro agree that customers might be more likely to enroll in the meter choices program and then drop out after a short period if there was a higher monthly fee and no initial fee than they would if there was a high initial fee and lower monthly fees? Please explain why or why not.

22.4. Would BC Hydro agree that the situation in which a customer enrolled in the choices program and then dropped out shortly thereafter would be exacerbated by the 'Do Nothing' option serving to enroll them?

22.4.1. Please explain why or why not.

23. Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

23.1. Does BC Hydro have any evidence that customers are equally predisposed to accepting a radio off meter as they are to retaining their analog meter?

23.1.1. If so, please provide.

23.2. Would BC Hydro agree that several customer issues raised with respect to the move to 'smart meters' are not solely related to the wireless aspect but include concerns related to the type and frequency of information collected,

23.3. Did BC Hydro conduct sensitivity analysis with respect to the proportion of radio-off meters and legacy meters?

23.3.1. If not, why not?

23.4. If so, please provide the results of any sensitivity analysis BC Hydro conducted with respect to the proportion of customers choosing radio-off or legacy meters.

23.5. Would BC Hydro agree that, with respect to incurring initial fees, customers will be more incented to stay with the analog meters than they would be to adopt meters with the radio turned off?

23.6. Would BC Hydro agree that many people find it easier to pay an additional $15 per month than it is to pay an initial fee of $100?

23.6.1. If not, please provide evidence that customers are equally interested in accepting a $100 initial fee as they would be in accepting a $15 monthly premium.

24. Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

24.1. Would BC Hydro agree that it would have been considerably less expensive to deploy smart meters throughout the service territory at the same time, rather than to have a second deployment for a small number of customers?

24.1.1. If not, please explain why not.

24.2. Please provide a total high level estimated cost of the December 2013 to April 2014 deployment of radio off smart meters as well as the cost per radio off meter installed compared to the cost per meter installed for the initial smart meter implementation.

24.3. Would BC Hydro agree that the cost of this deployment is directly attributable to the customers who requested deferral of the smart meters, and the costs associated with providing the Choice program.

24.3.1. If not, please explain why not.

24.3.2. Would BC Hydro agree that the additional cost of installation for those customers who deferred the installation but ultimately receive a wireless smart meter could reasonably be attributed to the cost of providing regular SMI service; whereas the cost of deferred installation for customers who do not select a wireless smart meter could reasonably be attributed to the costs of the Choice program?

24.3.2.1. Please explain why or why not.

24.4. Does BC Hydro agree that the legacy meters currently in place will require more frequent exchanges than smart meters?

24.4.1. If not, please explain why not.

24.5. What is the average service life of the Itron OpenWay Smart Meter?

24.5.1. What is the average remaining service life of the legacy meters that remain installed and of those that will be in inventory?

24.6. Does BC Hydro agree that replacing legacy meters with older legacy meters from inventory can reasonably be expected to result in a continuous shortening of the remaining service life of the legacy meters as they are replaced?

24.6.1. If not, please explain why not.

25. Exhibit B-1, page 3-5, Table 3-3

10 **Table 3-3 Capital and Operating Costs**

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

25.1. Please confirm that the total capital cost per customer ranges from approximately $553.35 to $332.04 per customer to undertake the Meter Choices customer program.

25.2. Please extend the table to include 2,500; 30,000; 40,000; 50,000; and 60,000 customers.

25.3. When will BC Hydro determine how much capital equipment is required and incur the capital costs associated with number of meter choices customers determined as of December 1, 2013.

25.4. Please confirm or otherwise explain that there would be no increase or decrease to the Information Technology requirements or costs regardless of the number of Meter Choices customers.

25.4.1. How often will Information Technology updates be required?

25.4.2. Please explain with quantification why the costs of Meter Reading Handheld Units declines on a per customer basis from $10.45 to $5.80 depending on the number of customers.

25.4.3. What is the service life of handheld meter reading units?

25.4.4. Please confirm that the cost of incremental check meters increases at a rate of $200,000 per 5,000 customers, or approximately $40 per customer after the first 5,000 customers.

25.4.5. Is there a minimum number of incremental check meters that would be required for a smaller number of meter choices customers?

25.4.5.1. If so, please explain with quantification as to the minimum expense for incremental check meters.

25.4.6. What is the service life of Incremental Check Meters?

25.4.7. Is the Incremental Telecom Infrastructure cost directly variable with the number of meter choices customers?

25.4.7.1. Please explain if the Incremental telecom infrastructure is a combined fixed and variable cost, or is a fully variable cost.

26. Exhibit B-1, page 3-6 to 3-7

> The cost of a meter exchange is estimated at $55, based on the average (weighted by region) cost of attendance at a customer's premises to install a smart meter (across BC Hydro's service territory) by BC Hydro's contractors. The underlying contractor costs apply to relatively low volume meter exchanges, and should be a good proxy for the cost to install radio-off meters.

26.1. Please confirm or otherwise explain that the 'weighted by region' factor would expect to be similar in the meter choices program as it is across BC Hydro's service territory.

26.2. What is the relatively low volume of meter exchanges to which $55 applies as a cost to install radio-off meters?

26.3. Does the meter exchange cost of $55 incorporate a cost for travel time based on a small number of meters dispersed over a wide geographic territory as opposed to a large number of meters dispersed over a wide geographic territory?

27. Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
EVP Changes	40,320	40,320	40,320	40,320
Grid Director Changes	40,320	40,320	40,320	40,320
Analytics Changes	43,992	43,992	43,992	43,992
Reports Changes	80,640	80,640	80,640	80,640
Testing Effort	201,430	201,430	201,430	201,430
Integration Effort	81,739	81,739	81,739	81,739
Project Management	108,480	108,480	108,480	108,480
Total Costs ($)	**1,238,577**	**1,238,577**	**1,238,577**	**1,238,577**

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

27.1. When, and over what period of time will BC Hydro incur the Radio Off information technology capital costs?

27.2. Please explain what BC Hydro means by 'enterprise applications'.

27.3. How often does BC Hydro expect to require IT upgrades to the Radio Off information technology?

27.4. Will BC Hydro be required to incur additional radio off technology capital costs whenever there are upgrades or changes related to the smart grid applications that affect radio off integration?

27.5. Please explain why or why not and provide a high level estimate of the costs that BC Hydro might expect to incur to maintain the integration in the face of changing smart grid IT.

27.6. How often might BC Hydro expect to have a change to the smart grid technology that affects the integration of radio off meters.

27.7. Would BC Hydro agree that as legacy meters will be completely removed from service by 2021, the amortization period attributable to legacy meters could be considered as 7 rather than 10 years?

27.7.1. If not, please explain why not.

28. Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	**52,236**	**81,256**	**98,668**	**116,080**

28.1. Please explain why the number of handhelds does not increase proportionally with the number of customers, such that there would be 18 units for 10,000 customers and 36 units required for 20,000 customers.

28.2. How many handheld units would BC Hydro require for 2,500 meter choices customers, and for 30,000, 40,000, 50,000 and 60,000 customers? Please extend the table accordingly.

28.3. Would BC Hydro agree that damage to tablets and optical probes which are being used regularly in the field will occur from time to time.

28.4. Please confirm that BC Hydro would likely maintain at least one spare handheld unit in the event that one or more is damaged or lost.

28.4.1. If no, please explain why not.

28.4.2. If yes, please confirm that extra handheld unit(s)have been accounted for in the capital costs or provide the extra costs necessary to maintain an appropriate level of backup units for number of meter choices customers, including consideration for geographic dispersion of the units.

28.5. What is the anticipated useful life for handheld units including consideration of technology changes and upgrades?

28.5.1. What was the amortization period BC Hydro employed for handheld units?

28.6. Please confirm or otherwise explain that BC Hydro will determine the number of handheld units required as of December 1, 2013 based on the number of customers who choose or who have deemed to have chosen to participate in the meter choices program.

28.7. Please provide BC Hydro's current best estimate of the number of handheld units it will require as of December 1, 2013.

28.8. Please confirm that the number of handheld units will account for geographic dispersion of meter choice customers.

28.9. Please confirm that to the extent that the number of meter reading customers declines over time, that the handheld units will not be needed.

28.10. Please explain how BC Hydro will handle the handheld units that would not be needed in the event of declining customer participation.

29. Exhibit B-1, page3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

29.1. What are BC Hydro's assumptions with respect to theft and grow ops as a percentage of customers retaining legacy meters? Please explain.

29.1.1. Please provide the estimated number of grow ops and total theft with legacy meters totaling 2,500; 5,000; 10,000; 15,000; 20,000; 30,0000; 40,000; 50,000 and 60,000.

29.2. Please confirm or otherwise explain that BC Hydro expects the proposed mitigation approach to fully compensate for any reduction to theft benefits that might accrue from the having remaining legacy meters in place.

29.2.1. If not confirmed, please explain in what ways the theft detection benefits might be compromised by having legacy meters in place and provide quantification based on 2,500, 5000, 7,500 and 10,000, 15,000 and 20,000 legacy meters remaining.

29.2.2. If BC Hydro does expect to fully mitigate the loss of theft detection benefits is there a threshold above which BC Hydro does not believe it could mitigate theft detection benefit losses?

29.3. Please confirm that theft detection becomes increasingly more difficult as the proportion of analogue meters increases.

29.3.1. If not confirmed, please explain why not.

29.3.2. If confirmed, please explain why the number of check meters decreases on a per customer basis as the number of analogue units increases.

29.4. Please provide the estimated number of units required to maintain all the theft detection benefits assuming a 75%/25% split legacy meter to radio off meters for 2,500; 5,000; 10,000, 15,000; 20,000; 30,000; 40,0000; 50,000; and 60,000 customers participating in the Choices program.

29.5. Please confirm that BC Hydro has incorporated an allotment for damage and replacement units.

29.5.1. If not confirmed, please provide BC Hydro's assessment of the number of replacement units that will be required over the life of the check meters.

29.6. Please confirm that as the legacy meters are expected to remain in place beyond the five year service life, BC Hydro will need to replace check meters after 5 years.

30. Exhibit B-1, page 3-11

18 **Table 3-6 Range Extender Requirements**

		One Range Extender Required Per X Meters Removed			
	Average Meter Density (meters/sq km)	Low	Med	High	Percent of BC Hydro Service Territory (%)
Metro/Dense	Greater than 2,000	NA	NA	NA	20.3
Urban	900 to 2,000	35	50	65	6.7
Suburban	60 to 900	21	30	39	56.4
Rural	2 to 60	6	8	10	9.9
Remote	Less than 2	1	2	3	5.6
Non-WAN		NA	NA	NA	1.0
Total					**100.0**

30.1. Is it BC Hydro's understanding that the geographic dispersion of customers who have refused smart meter service to date are dispersed in proportion to the percent of customers in BC Hydro service territory?

30.1.1. If not, please provide BC Hydro's estimates of how these customers are dispersed according to the average meter density.

31. Exhibit B-1, Pages 3-12 and 3-13

> The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

Table 3-7 Telecom Infrastructure Capital Costs

	Number of Radio-Off Customers			
	5,000	10,000	15,000	20,000
Range Extenders Required Per X Meters Removed				
Low	436	870	1,303	1,738
Medium	305	609	913	1,215
High	236	469	702	936
Total Cost of Design, Installed Range Extenders and Ancillary Equipment ($)				
Low	1,538,208	3,069,360	4,596,984	6,131,664
Medium	**1,076,040**	**2,148,552**	**3,221,064**	**4,286,520**
High	832,608	1,654,632	2,476,656	3,302,208

31.1. Please confirm that 'Radio Off' refers to Program participants and includes legacy meter customers.

31.2. Please extend the above table to include 30,000, 40,000, 50,000 and 60,000 participants.

31.3. Please confirm that BC Hydro will be able to determine the optimal location of range extenders as of December 1, 2013.

31.3.1. If not confirmed, when will BC Hydro be able to determine the optimal locations?

31.4. Please confirm or otherwise explain that BC Hydro will determine the appropriate number of, and invest in range extenders based on the estimated number of meter choice customers as of December 1, 2013.

31.5. Please confirm or otherwise explain that BC Hydro will have the range extenders in their capital costs based on the initial investment.

31.5.1. Please provide the historical frequency of customer moves within BC Hydro's service territory.

31.6. Will BC Hydro need to change locations to the extent that customers drop out of the choices program or move?

31.6.1. If so, please confirm that BC Hydro has accounted for the costs of potential changes in the locations of range extenders based on changing commitments to the choices program and expected moves.

31.6.2. If not confirmed, please provide BC Hydro's estimate of the cost of any changes that may be necessary given a changing and moving base of customers.

32. Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

32.1. Please provide a detailed list of activities that are undertaken to process a new customer account, such as reviewing credit history and customer communications and provide BC Hydro's estimate of the time allotted to each activity where available.

32.1.1. Please provide an estimate of the portion of the $12.40 account charge that may be attributed to customer communications.

32.2. Would BC Hydro agree that the processes for new customers are well entrenched in the BC Hydro system and familiar to employees who are responsible for processing new customers, and to customers who are requesting service?

32.2.1. If not, please explain why not.

32.3. How many new customer accounts does BC Hydro process per year?

32.4. Please provide a detailed list of activities that BC Hydro predicts will need to be undertaken to modify a customer account to allow for radio off or legacy meters including determination of eligibility, and customer communications and payment history.

32.5. Would BC Hydro agree that customer communication will be a key component of the new process to modify accounts to accommodate meter choice customers?

32.5.1. If not, please explain why not with an estimate of the time BC Hydro has already spent communicating with individual customers related to opting out of service.

32.6. Would BC Hydro agree that new processes will be required to determine eligibility for the meter choices program and that they will not be familiar either to staff or customers?

32.6.1. If not, please explain why not.

32.7. Would BC Hydro agree that those customers participating in the meter choice program may not be as accepting of the process and affiliated charges with the meter choice program as customers who are seeking new customer accounts?

32.7.1. If not, please explain why not.

32.8. Would BC Hydro agree that a premium for the customer communications aspect of the account charge would not be unreasonable for communications related to the meter choices

account processing because dealing with meter choice customers are likely to be more complicated than dealing with a new account?

32.8.1. If not, please explain why not and provide a rationale as to why no premium would be necessary.

32.9. Would BC Hydro agree that a premium for the other aspects of the processing costs might be appropriate given the newness of the process for staff and customers alike which may be expected to increase the costs relative to new account processing.

33. Exhibit B-1, page 3-14 Table 3-8

1
2

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	**62,000**	**124,000**	**186,000**	**248,000**

33.1. Please confirm that BC Hydro will need to communicate with and possibly undertake partial processing for customers who are either not eligible for the meter choices program or those customers who change their change their mind.

33.2. Would BC Hydro agree that there is likely to be customer complaints related to the increase in analogue charges for those customers who 'Do Nothing' and receive a charge of $35 per month commencing in December 2013 or other reason related to the meter choice program.

33.2.1. If not, please explain why not.

33.2.2. If so, please provide BC Hydro's estimate of the number of customer complaints it expects to receive from meter choice customers including those who receive service and then revert to smart meters.

33.3. What is the typical cost of resolving a customer complaint?

33.4. What is the percentage labour and the percentage of non-labour that is embedded in the account processing cost?

33.5. Please confirm that the labour portion is based on standard labour costs.

33.6. If so, please provide the documentation for the standard labour cost with breakdown for the component costs.

33.6.1. If not confirmed, please provide BC Hydro's labour cost and the breakdown of components that are included in the labour portion of the processing cost.

33.7. Please identify any supervisory or managerial costs that would be required to manage the staff necessary for processing the Meter choices customers.

33.8. Please confirm that account processing would require a change in total staff accommodate substantial changes in the number of meter choices customers.

33.9. Please confirm or otherwise explain that BC Hydro will determine the staffing necessary based on those customers who have chosen or who have been deemed to have chosen Meter choices program as of December 1, 2013.

33.10. Please explain how BC Hydro will adjust the staffing levels based on declining participation in the meter choice program.

34. Exhibit B-1, page 3-14

> ***3.4.2.2 Radio-Off Meter Deployment***
>
> The firmware update required to deactivate the radio will be performed by a Meter and Instrument Technician, and the BC Hydro standard labour rate for this resource, which includes benefits, is currently $64.59 per hour. The cost to download the firmware and deactivate the field area network radio is therefore $26.91 per unit (i.e., 25 minutes ÷ 60 minutes × $64.59 per hour).

34.1. Will the firmware update be conducted in the field or in BC Hydro offices prior to deployment?

34.1.1. If conducted in the field, please confirm that BC Hydro has allocated travel time, vehicle costs and travel costs to the cost for deactivating the radio and provide an estimate of these costs.

34.1.1.1. If not confirmed, please calculate an estimate of the vehicle costs, travel costs and travel time that would accrue to this activity, including time spent refueling, and BC Hydro's estimate of time spent driving between non-contiguous locations.

34.2. Please provide documentation of the standard labour rate including the breakdown of cost components.

34.2.1. To the extent that they are not included in the documentation, please provide BC Hydro's breakdown of the component costs.

35. Exhibit B-1, page 3-15

3.4.2.3 *Training and Transition to Operations*

It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

35.1. Would BC Hydro expect that the $48,000 would increase if the number of meter choices customers is in the order of 60,000?

35.1.1. Please explain why or why not.

35.2. What is the proportion of labour and non-labour that is included in the training and transition to operations.

35.3. Please confirm that the labour component is based on standard labour costs.

35.3.1. If confirmed, please provide the appropriate documentation of the standard labour cost with breakdown of the component costs that are included.

35.3.2. To the extent that the component costs are not broken down, please provide BC Hydro's estimate of the component costs.

35.3.3. If not confirmed, please provide BC Hydro's labour costs with a breakdown of the component costs.

35.4. What is included in the non-labour portion of Training and Transition to Operations?

35.5. Please confirm that the Training and Transition to Operations will likely require call centre agents to handle a large volume of calls related to the meter choices program from those customers who change their minds and do not participate in the meter choices program.

35.5.1.1. Please confirm or otherwise explain that BC Hydro has accounted for these calls in its estimate of Total Costs.

35.5.1.2. If not, please provide an estimate of the additional expense that will be required to handle calls related to the meter choice program that do not result in a long term meter choice customer.

35.6. Please confirm that BC Hydro has already or will undertake to staff and prepare for Training and Transition based on the number of customers who have chosen or are deemed to have chosen to participate in the Meter choices program as of December 1, 2013.

36. Exhibit B-1, page 3-16

> ***3.4.2.4 IT Support and Maintenance***
>
> Annual IT maintenance and support is estimated at 10 per cent of IT capital (including handheld devices), and includes costs related to hardware and software maintenance, periodic maintenance and troubleshooting, management, etc. IT maintenance is estimated about $0.12 million per year.

36.1. Please confirm that labour costs associated with IT and support maintenance are the standard labour costs.

36.2. If not confirmed, please provide the standard labour costs for each position.

36.3. Please provide the documentation of the standard labour costs detailing the breakdown of the component costs for each positions.

36.4. To the extent that the documentation does not breakdown the component costs, please supply BC Hydro's breakdown of the component costs of each labour position.

36.5. Please quantify the supervisory labour and management staff that is required to manage the additional labour.

37. Exhibit B-1, page 3-17 and 3-18

Based on a per unit meter exchange cost of $55, the cost of meter exchanges due to expired Measurement Canada seals is estimated as follows:

Table 3-11 Legacy Meter Exchange Costs

Year	Percent Seal Expiry (%)	Cost Per Exchange ($)	Meter Exchanges			
			2,500 Legacy Meter Customers	5,000 Legacy Meter Customers	7,500 Legacy Meter Customers	10,000 Legacy Meter Customers
2014	53.5	$ 55	1,338	2,677	4,015	5,354
2015	7.7	56	191	383	574	765
2016	12.0	57	301	602	903	0
2017	1.7	58	43	87	0	0
2018	18.0	60	449	531	0	0
2019	2.7	61	0	0	0	0
2020	3.2	62	0	0	0	0
2021	1.1	63	0	0	0	0
Total Exchanges	**100.0**		2,322	4,280	5,492	6,119
Total Cost ($)			130,877	239,903	304,440	337,310
Average Annual Cost ($)			16,360	47,981	76,110	84,328

To maintain rate stability, it is proposed that cost recovery for expired meter seal exchanges in each year be aligned to the average over the period to 2021 (i.e., the latest year of meter seal expiry).

37.1. Please confirm or otherwise explain that legacy meters should be eliminated completely from BC Hydro service territory by 2021.

37.2. Please confirm that BC Hydro has communicated the expected termination date of available legacy meters to potential meter choice customers.

37.3. Please confirm that the cost of maintaining legacy meter inventory including physical space, maintenance and management and insurance has been incorporated into the costs of the meter choice program.

37.3.1. If so, please identify where the costs have been incorporated into the program.

37.3.2. If not, please provide an estimated cost of the maintaining an inventory of legacy meters for 7 years.

38. Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

38.1. Please confirm that labour costs associated with field investigators, meter technicians, electrical contractors and analysts are the standard labour costs.

38.2. If not confirmed, please provide the standard labour costs for each of these positions.

38.3. Please provide the documentation of the standard labour costs detailing the breakdown of the component costs for each of these positions.

38.4. To the extent that the documentation does not breakdown the component costs, please supply BC Hydro's breakdown of the component costs of each labour position.

38.5. Please quantify the supervisory labour and management staff that is required to manage the additional theft detection labour.

38.6. How much of the above labour requirements reflect time required to integrate the investigation results with fire and safety professionals, police and customer service and other pre or post investigation activities?

38.7. How much of the field investigator's time is spent in the field vs. in BC Hydro offices?

38.8. How much of the meter technician's time is spent in the field vs. BC Hydro offices?

38.9. What training costs are associated with field investigators, meter technicians, and analyst positions respectively.

38.9.1.1. Please provide estimated annual training costs and indicate if these costs are included in the labour costs.

38.10. Please extend the above table to include the customer numbers of 15,000; 20,000; 30,000; 40,000; 50,000 and 60,000.

38.11. Please confirm or otherwise explain that BC Hydro will determine the total number of field investigators, meter technicians and analysts that are required based on the number of customers who choose or who are deemed to have chosen legacy meters as of December 1,2013.

38.12. Would BC Hydro agree that there could be a large number of customers deemed to be legacy meters customers on December 1, 2013?

38.12.1. If not, please explain why not.

38.13. Please confirm or otherwise explain that there will be a lag in the reduction of the theft detection resources to the extent that customers who choose or who are deemed to have chosen legacy meters declines from December 1, 2013 over a period of time.

38.14. Please explain how BC Hydro intends to deal with a declining requirement for theft reduction capabilities and for how long BC Hydro would maintain these resources following reduction of legacy meter customers.

38.15. Please provide BC Hydro's assumptions with respect the number of grow ops that are expected to occur under a situation in which there are 2,500; 5,000; 10,000; 15,000, 20,000; 30,000, 40,000, 50,000 and 60,000 legacy meters installed.

38.16. Please provide BC Hydro's assumptions with respect to the proportion of grow ops that would occur under full deployment of smart meters.

38.17. Would BC Hydro agree that grow ops are more likely to occur in a population requesting legacy meters than they would in the general population.

38.17.1. Please explain why or why not.

38.18. Please provide BC Hydro's assumptions with respect to the proportion of grow ops that are expected in the main customer base.

39. Exhibit B-1, page 3-19, page 3-20 and 3-22

> Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this
>
> agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

39.1. Please explain whether or not there may be additional meter reading visits undertaken based on customer requests or concerns, customer moves, meter reading errors or other unanticipated events.

39.1.1. If so, please provide an estimate of the number of additional reads that may be required for meter choice customers.

39.2. Please explain if the meter reading conducted under contract is based on a 'per read' cost or on a fixed price and/or term which is dependent on BC Hydro accurately estimating the number of meter reads required.

39.3. Please confirm that the meter reading costs associated with the FMA are based on standard labour costs.

39.3.1.1. If not confirmed, please provide the standard labour costs associated with the FMA positions.

39.3.1.2. Please provide documentation for the standard FMA labour costs including the breakdown of component costs.

39.3.1.3. To the extent that the documentation does not provide the breakdown of the component costs of the FMA position, please provide BC Hydro's breakdown.

39.3.2. Please identify and quantify the supervisory and/or management costs that are associated with managing the contract for meter reading and maintaining the vehicle fleet.

39.4. Please identify and quantify any FMA time that for which BC Hydro pays that is not spent 'meter reading'.

39.5. Please identify and quantify any manual meter reading costs that are not captured in the above analysis such as training.

39.6. Please extend the above table to include 30,000, 40,000, 50,000 and 60,000 meter choice customers.

39.7. Please confirm or otherwise explain that BC Hydro will contract for meter reading services based on the number of customers who choose or who are deemed to have chosen to participate in the meter choice program as of December 1, 2013.

39.8. Please explain how BC Hydro will manage the meter reading contract based on declining participation over time, and if BC Hydro would be require a meter read at the time a customer is converted to a smart meter radio on from a legacy meter.

40. Exhibit B-1, page 3-20

> Choices Program. The final adjustment is intended to capture meter reading productivity gains once the number and location of Meter Choices customers and non-WAN customers (i.e., those customers outside the range of backhaul communications) have a reached a "steady state." Currently, meter routes are

40.1. When does BC Hydro expect the number and location of Meter Choices customers to reach a 'steady state'?

40.1.1. Please provide a discussion of BC Hydro's expectations with respect to the changing numbers of meter choices customers and provide any sensitivity analysis that BC Hydro has conducted.

41. Exhibit B-1, page 3-21

> not expected to change materially. Currently, these costs are about $120,000 per year, and a decrease to $100,000 per year is assumed. These costs have been allocated on a weighted basis to both non-WAN customers and customers choosing to participate in the Meter Choices Program. Accordingly, travel costs are estimated at about $0.64 per read (based on 5,000 Meter Choices customers) to about $0.41 per read (based on 20,000 Meter Choices customers).

41.1. Please explain why a reduction of $20,000 in travel expenses to $100,000 has been assumed.

41.2. Please confirm that the labour portion (time spent traveling) is incorporated into the into the travel related costs, and provide an explanation with a cost estimate of this portion.

42. Exhibit B-1, page 3-23

Table 3-14 Revenue Requirement – Meter Choices Program

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Revenue Requirement (Current Period)				
Operating Costs ($)	2,388,519	3,141,529	4,168,974	5,085,025
Capital Related Costs ($)	434,503	606,470	773,931	940,677
Total Revenue Requirement (Current Period) ($)	2,823,022	3,747,999	4,942,905	6,025,702
Add: Radio-Off Meter Removal (Future Period) ($)	137,500	275,000	412,500	550,000
Total Revenue Requirement ($)	**2,960,522**	**4,022,999**	**5,355,405**	**6,575,702**
Revenues				
Initial Fee - Radio-Off Option ($)	260,021	495,803	731,584	967,365
Monthly Fee Radio-Off Option ($)	857,684	1,193,559	1,438,964	1,683,629
Monthly Fee - Legacy Meter Option ($)	1,744,129	2,169,696	2,952,267	3,603,421
Total Revenues ($)	**2,861,834**	**3,859,058**	**5,122,815**	**6,254,415**
Remaining TTO & Account Processing Recovery (Years 2 to 4) ($)	41,430	64,680	87,930	111,180
Difference in Expired Meter Seal Exchange Cost (Year 1 less Average) ($)	57,258	99,260	144,660	210,106
Adjusted Revenues ($)	**2,960,522**	**4,022,998**	**5,355,405**	**6,575,701**

42.1. Please extend the table to incorporate customer participation at 30,000; 40,000; 50,000 and 60,000.

42.2. Please explain how the TTO and Account processing recovery costs are calculated and how they will be recovered from customers in the meter choice program.

42.3. Please explain how the Difference in Expired Meter Seal Exchange costs is calculated and how they will be recovered from customers in the meter choice program.

42.4. Please explain how BC Hydro will recover cost from Meter Choice customers in the event that the costs are higher than anticipated.

43. Exhibit B-1 page 3-24

Table 3-15 Radio-Off Meter Option Capital Related Costs

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Amortization				
IT Integration – 10-Year Life ($)	123,858	123,858	123,858	123,858
Handheld Units – 3-Year Life ($)	17,411	27,084	32,887	38,691
Telecom Range Extenders – 27-Year Life[22] ($)	39,687	79,244	118,802	158,098
Check Meters – 5-Year Life ($)	80,000	120,000	160,000	200,000
Total Amortization to be Recovered ($)	260,956	350,186	435,547	520,647
Finance Charges ($)	79,906	118,001	155,802	193,394
Return on Equity ($)	93,641	138,284	182,583	226,636
Total Capital Related Costs ($)	**434,503**	**606,471**	**773,932**	**940,677**

Finance charges are based on a rate of 4.36 per cent, which reflects BC Hydro's weighted average cost of debt forecasted for F2015 as of August 2013. The calculated Return on Equity is based on a cost of equity of 11.84 per cent, and in accordance with Heritage Special Direction No. HC2 deemed equity of 30 per cent of plant in service is assumed.

43.1. Please extend the table to include 30,000; 40,000; 50,000 and 60,000 customers.

44. Exhibit B-1, page 3-27 and 3-28

> BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).
>
> The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

44.1. Please confirm that BC Hydro would not undertake additional time to communicate with a customer in a situation in which the customer's premises were blocked from an attempted installation.

44.1.1. Please confirm that the call centre cost at $10 per call for a 5 minute call is about $2 per minute.

44.1.2. If not confirmed, please provide the appropriate calculation for different call lengths.

44.2. Please confirm that the call centre costs are based on standard labour costs.

44.3. If not confirmed, please provide the standard labour costs for each position.

44.4. Please provide the documentation of the standard labour costs detailing the breakdown of the component costs for each position.

44.5. To the extent that the documentation does not breakdown the component costs, please supply BC Hydro's breakdown of the component costs of each labour position.

44.6. Please quantify the supervisory labour and management staff that is required to manage the additional labour.

44.7. On what basis did BC Hydro select an average call length of about 5 minutes?

44.8. Has it been BC Hydro's experience that communications with customers who have refused smart meter installations and not permitted access require approximately 5 minutes to resolve?

44.8.1. If not, please provide BC Hydro's estimate of the time it takes to resolve a situation in which a customer has blocked or otherwise not permitted access to allow meter installation.

45. Exhibit B-1, Appendix I

Blended Standard Labour Rate to Upper Band of 47.3 FMAs	$ 133,312	$ 133,312	$ 133,312	$ 133,312
FMA Standard Labour Rate	103,890	103,890	103,890	103,890
Support Staff Standard Labour Rate	143,356	143,356	143,356	143,356

45.1. Please provide an explanation of the positions represented by the Blended Standard Labour Rate to Upper Band of 47.3 FMAs.

45.1.1. Please explain how these costs were derived.

45.2. Please provide an explanation as to the FMA standard Labour Rate and how it was derived.

45.3. Please provide an explanation as to the Support Staff standard Labour rate.

46. Contingencies

46.1. Please confirm that when BC Hydro is making significant cost estimates, for instance for its SMI initiative, BC Hydro regularly adds a contingency estimate to its costing to allow for uncertainty and unknowns.

46.2. Please indicate whether or not contingency estimates have been incorporated into the costing for the BC Hydro smart meter customer choice program.

46.2.1. If so, please provide the total contingency estimate.

46.2.2. If not, please provide a reasonable contingency estimate for all costs.

47. Productive Time Estimates

47.1. Please provide a list of all calculations dependent upon a determination of productive time available from employees, whether for cost estimating or for quantity estimating.

47.2. Please provide a list of, and descriptions for, types of non-productive time (ie. non-direct task time) such as, dealing with supervisor, training time, filling out time sheets, completing other forms of administrative reporting, weather or traffic disruption, etc.

47.3. Please indicate for each instance where productive time estimates are used whether or not an allowance for non-productive time should be incorporated into the calculations.

47.3.1. If so, please provide the details of the non-productive time estimates used by BC Hydro and if non-productive time has not been incorporated in BC Hydro's estimates please provide an estimate for the amount of non-productive time that should be included.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.1 Please confirm that BC Hydro has attempted to install smart meters at every possible location, and that this was undertaken before October 25th, 2013.

RESPONSE:

BC Hydro attempted to install smart meters at eligible premises, unless a customer called in advance and requested that their smart meter installation be delayed. An exception is BC Hydro's Nakusp billing area in the West Kootenay region, where meter installations were delayed while BC Hydro engaged local wireless Internet Service Providers regarding their concerns.

1.0 Exhibit B-1, page 1-1

17 Despite BC Hydro's efforts, approximately 60,000 customers are continuing to
18 request the meter exchange at their premises be put on hold. In addition, there are
19 about 15,000 smart meter installations that have not been completed for various
20 reasons.

1.1.1.1 If not confirmed, please identify how many locations were not attempted before October 25th, and why.

RESPONSE:

In BC Hydro's Nakusp billing area, approximately 1,800 installations were delayed. Please refer to the response to CEC IR 1.1.1.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.1.2 If not confirmed, will BC Hydro have made an attempt at every location before December 1, 2013?

RESPONSE:

No, if an eligible customer does not have a smart meter installed at their premises, BC Hydro will not attempt to install a meter at the premises unless a customer selects the radio-off or smart meter option (or the legacy meter seal expires or the meter breaks).

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.1.2.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.1.1.2.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.2 Please confirm that of the 15,000 smart meter installations that have not been completed 'for various reasons' none are related to customer concerns with smart meters.

RESPONSE:

Confirmed. Please refer to the response to BCUC IR 1.1.5.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.2.1 If not confirmed, please provide the number of smart meters that have been included in this group that are, or could reasonably be anticipated, to stem from customer discomfort with smart meters.

RESPONSE:

Not applicable.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.2.2 Would BC Hydro agree that the 15,000 customers could include customers who will refuse smart meters and adopt the meter choice program?

RESPONSE:

All the residential customers in this group of 15,000 are eligible for the Meter Choices Program.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.2.2 Would BC Hydro agree that the 15,000 customers could include customers who will refuse smart meters and adopt the meter choice program?

1.1.2.2.1 If not, please explain why not.

RESPONSE:

Not applicable.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.2.2 Would BC Hydro agree that the 15,000 customers could include customers who will refuse smart meters and adopt the meter choice program?

1.1.2.2.2 If so, would BC Hydro agree that the numbers of refusals could be proportionate to the number of refusals that occurred in the general customer base?

RESPONSE:

BC Hydro's assumption of 10,000 customers electing a legacy meter or radio-off meter includes those residential customers who have refused the installation of a smart meter and those where a smart meter has not been installed for other reasons.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.2.2.3 Please explain why or why not.

RESPONSE:

There may be a range of customer opinions within this group, as something like a meter at an excessive height has no direct correlation to opposing or supporting smart meters. Please refer to the response to CEC IR 1.1.2.2.2.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.3 Please provide a high level discussion of the 'various reasons' for which 15,000 installations have not been completed and provide approximate quantification of how many uncompleted installations can be attributed to each reason.

RESPONSE:

As of November 13, 2013:

	Per cent
Unable to Access:	**39**
Permanent Obstructions:	**31**
Excessive Height:	**8**
Unsafe Hazardous:	**12**
Incorrect Meter Information:	**3**
Voltage Mismatch:	**2.6**
Diversions:	**0.4**
Other:	**4**

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.4 Does BC Hydro expect to install smart meters in all 15,000 meter locations that have not yet been installed?

RESPONSE:

All residential customers within the 15,000 are eligible for the Meter Choices Program.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.4.1 If yes, please explain when the remaining 15,000 meter installations are expected to be complete.

RESPONSE:

Please refer to the response to CEC IR 1.1.4.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.4.2 If no, please explain with quantification how many of the 15,000 smart meter installations have been deferred and how many will not likely be undertaken at all.

RESPONSE:

Please refer to the response to CEC IR 1.1.4.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.4.3 How many of the 15,000 meter installations that have not been completed at the time of Application remained uncompleted as October 25th, 2013?

RESPONSE:

As of October 20, 2013, there were approximately 11,500 remaining.

1.0 Exhibit B-1, page 1-1

> 17 Despite BC Hydro's efforts, approximately 60,000 customers are continuing to
> 18 request the meter exchange at their premises be put on hold. In addition, there are
> 19 about 15,000 smart meter installations that have not been completed for various
> 20 reasons.

1.1.5 What is BC Hydro's current best estimate of the number of customers who will be eligible for and choose or deemed to have chosen to participate in the Meter Choices program?

RESPONSE:

BC Hydro continues to believe that the number of customers who are eligible to, and choose or are deemed to choose either a legacy or radio-off meter will likely fall within the range of 5,000 to 20,000, and has proposed charges aligned to approximately 10,000 customers choosing either of these options. It is further assumed that 50 per cent will choose a radio-off meter and 50 per cent will choose a legacy meter. Please refer to the Application, page 3-4, lines 3-8. Please also refer to the response to BCUC IR 1.6.5.1.

1.0 Exhibit B-1, page 1-1

> Despite BC Hydro's efforts, approximately 60,000 customers are continuing to request the meter exchange at their premises be put on hold. In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.1.5.1 Please breakdown by 'radio off' and 'legacy meter'.

RESPONSE:

Please refer to the response to CEC IR 1.1.5.

2.0 Exhibit B-1. Appendix B Direction No. 4 to the British Columbia Utilities Commission page 3 of 7 and page 5 of 7

(2) The commission must not require the authority to install a legacy meter or radio-off meter for

(a) a non-residential customer, or

(b) an applicable customer, if a smart meter is installed at the applicable premises of the applicable customer on or after the date this direction comes into force.

4.2.2. Conditions for Retention or Installation of Legacy Meters and Radio-off Meters

The conditions that must be satisfied in order for BC Hydro to permit to remain in operation, install, replace, maintain and service Legacy Meters or Radio-off Meters at a Residential Service Customer's Premises are:

(a) the Customer is, as of the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), taking Residential Service at the Customer's Premises;

(b) BC Hydro had not, before the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), installed a Smart Meter at the Customer's Premises, but rather a Legacy Meter remained in place at those Premises as of the date of the Customer's election or deemed election; and

(c) the Customer, during the period beginning September 1, 2013 and ending December 1, 2013, by notice to BC Hydro, elects to retain the Legacy Meter then in place at the Customer's Premises, or to have a Radio-off Meter installed in place of the Legacy Meter; or

(d) the Customer, despite satisfactionof the conditions set out in clauses (a) and (b) has failed to provide notice of election to BC Hydro in accordance with clause (c), in which case the Customer shall be deemed to have electedeffective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed at the Customer's Premises as set out in the Schedule of Standard Charges.

1.2.1 Please confirm that under no circumstances can an existing customer who already has a smart meter installed at their residential premises elect to have the radio turned off, or to have a Legacy Meter installed.

RESPONSE:

Confirmed.

2.0 Exhibit B-1. Appendix B Direction No. 4 to the British Columbia Utilities Commission page 3 of 7 and page 5 of 7

(2) The commission must not require the authority to install a legacy meter or radio-off meter for

(a) a non-residential customer, or

(b) an applicable customer, if a smart meter is installed at the applicable premises of the applicable customer on or after the date this direction comes into force.

4.2.2. Conditions for Retention or Installation of Legacy Meters and Radio-off Meters

The conditions that must be satisfied in order for BC Hydro to permit to remain in operation, install, replace, maintain and service Legacy Meters or Radio-off Meters at a Residential Service Customer's Premises are:

(a) the Customer is, as of the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), taking Residential Service at the Customer's Premises;

(b) BC Hydro had not, before the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), installed a Smart Meter at the Customer's Premises, but rather a Legacy Meter remained in place at those Premises as of the date of the Customer's election or deemed election; and

(c) the Customer, during the period beginning September 1, 2013 and ending December 1, 2013, by notice to BC Hydro, elects to retain the Legacy Meter then in place at the Customer's Premises, or to have a Radio-off Meter installed in place of the Legacy Meter; or

(d) the Customer, despite satisfactionof the conditions set out in clauses (a) and (b) has failed to provide notice of election to BC Hydro in accordance with clause (c), in which case the Customer shall be deemed to have electedeffective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed at the Customer's Premises as set out in the Schedule of Standard Charges.

1.2.1.1 If not confirmed, please explain the circumstances in which a person who already accepted a smart meter could arrange to have the radio turned off or have a Legacy Meter installed.

RESPONSE:

Please refer to the response to CEC IR 1.2.1.

2.0 Exhibit B-1. Appendix B Direction No. 4 to the British Columbia Utilities Commission page 3 of 7 and page 5 of 7

(2) The commission must not require the authority to install a legacy meter or radio-off meter for

(a) a non-residential customer, or

(b) an applicable customer, if a smart meter is installed at the applicable premises of the applicable customer on or after the date this direction comes into force.

4.2.2. **Conditions for Retention or Installation of Legacy Meters and Radio-off Meters**

The conditions that must be satisfied in order for BC Hydro to permit to remain in operation, install, replace, maintain and service Legacy Meters or Radio-off Meters at a Residential Service Customer's Premises are:

(a) the Customer is, as of the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), taking Residential Service at the Customer's Premises;

(b) BC Hydro had not, before the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), installed a Smart Meter at the Customer's Premises, but rather a Legacy Meter remained in place at those Premises as of the date of the Customer's election or deemed election; and

(c) the Customer, during the period beginning September 1, 2013 and ending December 1, 2013, by notice to BC Hydro, elects to retain the Legacy Meter then in place at the Customer's Premises, or to have a Radio-off Meter installed in place of the Legacy Meter; or

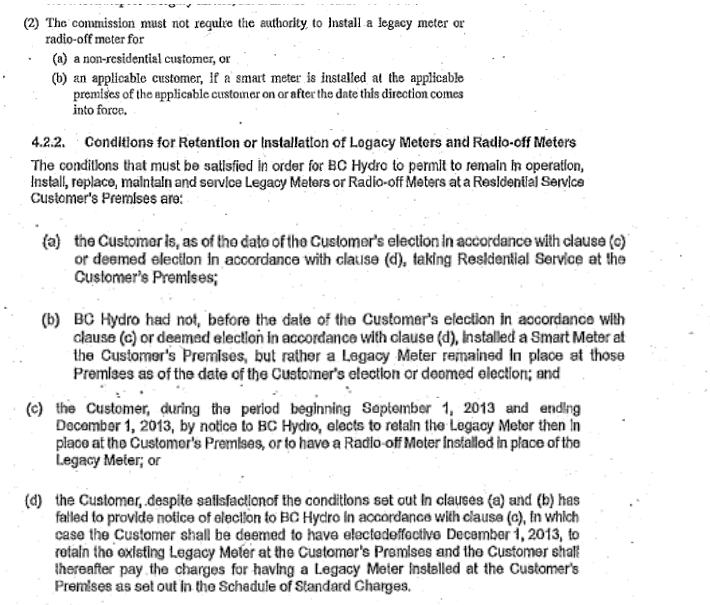
(d) the Customer, despite satisfactionof the conditions set out in clauses (a) and (b) has failed to provide notice of election to BC Hydro in accordance with clause (c), in which case the Customer shall be deemed to have electedeffective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed at the Customer's Premises as set out in the Schedule of Standard Charges.

1.2.2 Please confirm that a customer who is new to BC Hydro cannot arrange to have a radio off meter or a Legacy meter installed.

RESPONSE:

Confirmed.

2.0 Exhibit B-1. Appendix B Direction No. 4 to the British Columbia Utilities Commission page 3 of 7 and page 5 of 7



(2) The commission must not require the authority to install a legacy meter or radio-off meter for

(a) a non-residential customer, or

(b) an applicable customer, if a smart meter is installed at the applicable premises of the applicable customer on or after the date this direction comes into force.

4.2.2. Conditions for Retention or Installation of Legacy Meters and Radio-off Meters

The conditions that must be satisfied in order for BC Hydro to permit to remain in operation, install, replace, maintain and service Legacy Meters or Radio-off Meters at a Residential Service Customer's Premises are:

(a) the Customer is, as of the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), taking Residential Service at the Customer's Premises;

(b) BC Hydro had not, before the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), installed a Smart Meter at the Customer's Premises, but rather a Legacy Meter remained in place at those Premises as of the date of the Customer's election or deemed election; and

(c) the Customer, during the period beginning September 1, 2013 and ending December 1, 2013, by notice to BC Hydro, elects to retain the Legacy Meter then in place at the Customer's Premises, or to have a Radio-off Meter installed in place of the Legacy Meter; or

(d) the Customer, despite satisfactionof the conditions set out in clauses (a) and (b) has failed to provide notice of election to BC Hydro in accordance with clause (c), in which case the Customer shall be deemed to have electedeffective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed at the Customer's Premises as set out in the Schedule of Standard Charges.

1.2.3 Please confirm that based Directive No. 4 section 4.2.2(d), '…in which case the Customer shall be deemed to have elected effective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed…'a qualifying customer with a Legacy meter in place as of December 1, 2013 would retain their Legacy Meter unless they explicitly communicate with BC Hydro that they wish to receive a smart meter or a smart meter with the radio off?

RESPONSE:

Confirmed. BC Hydro will leave the legacy meter in place at the premises of a customer that is eligible for the Meter Choices Program unless the customer, by notice to BC Hydro, elects the radio-off or smart meter option. The legacy meter may remain in place subject to the terms and conditions set out in section 4.2.3 of the BC Hydro Electric Tariff as amended by BCUC Order No. G-166-13 and in accordance with Direction No. 4.

2.0 Exhibit B-1. Appendix B Direction No. 4 to the British Columbia Utilities Commission page 3 of 7 and page 5 of 7

(2) The commission must not require the authority to install a legacy meter or radio-off meter for

(a) a non-residential customer, or

(b) an applicable customer, if a smart meter is installed at the applicable premises of the applicable customer on or after the date this direction comes into force.

4.2.2. Conditions for Retention or Installation of Legacy Meters and Radio-off Meters

The conditions that must be satisfied in order for BC Hydro to permit to remain in operation, install, replace, maintain and service Legacy Meters or Radio-off Meters at a Residential Service Customer's Premises are:

(a) the Customer is, as of the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), taking Residential Service at the Customer's Premises;

(b) BC Hydro had not, before the date of the Customer's election in accordance with clause (c) or deemed election in accordance with clause (d), installed a Smart Meter at the Customer's Premises, but rather a Legacy Meter remained in place at those Premises as of the date of the Customer's election or deemed election; and

(c) the Customer, during the period beginning September 1, 2013 and ending December 1, 2013, by notice to BC Hydro, elects to retain the Legacy Meter then in place at the Customer's Premises, or to have a Radio-off Meter installed in place of the Legacy Meter; or

(d) the Customer, despite satisfactionof the conditions set out in clauses (a) and (b) has failed to provide notice of election to BC Hydro in accordance with clause (c), in which case the Customer shall be deemed to have electedeffective December 1, 2013, to retain the existing Legacy Meter at the Customer's Premises and the Customer shall thereafter pay the charges for having a Legacy Meter installed at the Customer's Premises as set out in the Schedule of Standard Charges.

1.2.3.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.2.3.

3.0 Exhibit B-1, Appendix B page 6 of 7

(b) If the seal of a Legacy Meter expires, or the meter ceases to function properly before the seal expiry date, BC Hydro will, so long as it has a suitable Legacy Meter in its meter inventory available for installation, install a replacement Legacy Meter at the Customer's Premises. A Customer for whom a replacement Legacy Meter has been installed in accordance with the preceding sentence can continue to retain the replacement Legacy Meter for the period specified in clause (a), and any replacement Legacy Meter so installed shall be subject to replacement in accordance with this clause (b) as the occasion arises. For purposes of this section, BC Hydro will only be deemed to have suitable replacement Legacy Meters in its meter inventory if it has existing verified and sealed Legacy Meters in its meter inventory as of the date that a Legacy Meter in place at a Customer's Premises requires replacement, and BC Hydro is under no obligation to repair, rebuild or modify, or re-verify and re-seal, any Legacy Meters that have been removed from service for any reason, nor to purchase or otherwise acquire from any source any Legacy Meters in replenishment of its Legacy Meter inventory.

1.3.1 When, relative to the seal expiration date, will customers be notified that the seal on their meter either has expired, or will expire?

RESPONSE:

The granularity of Measurement Canada seal validity period is in years. Customers with an expiring meter will receive notice within the last valid year or a few months prior to the last valid year.

Consistent with the above practice, for customers choosing the legacy meter option and having a meter that has already expired or is expiring in 2013 and 2014, BC Hydro will send notice of legacy-to-legacy meter replacement upon confirming their enrolment.

3.0 Exhibit B-1, Appendix B page 6 of 7

(b) If the seal of a Legacy Meter expires, or the meter ceases to function properly before the seal expiry date, BC Hydro will, so long as it has a suitable Legacy Meter in its meter inventory available for installation, install a replacement Legacy Meter at the Customer's Premises. A Customer for whom a replacement Legacy Meter has been installed in accordance with the preceding sentence can continue to retain the replacement Legacy Meter for the period specified in clause (a), and any replacement Legacy Meter so installed shall be subject to replacement in accordance with this clause (b) as the occasion arises. For purposes of this section, BC Hydro will only be deemed to have suitable replacement Legacy Meters in its meter inventory if it has existing verified and sealed Legacy Meters in its meter inventory as of the date that a Legacy Meter in place at a Customer's Premises requires replacement, and BC Hydro is under no obligation to repair, rebuild or modify, or re-verify and re-seal, any Legacy Meters that have been removed from service for any reason, nor to purchase or otherwise acquire from any source any Legacy Meters in replenishment of its Legacy Meter inventory.

1.3.2 Please provide an example of the customer notification that will be sent out prior to the meter being removed.

RESPONSE:

Please refer to the attached letter.

[Date], 2013

[Name]
[Address]

Dear [name],

RE: Meter Replacement Notification

The Measurement Canada seal on the meter at your premises has expired and the meter must be exchanged to ensure compliance with federal regulations. In the coming weeks, a BC Hydro installer or licensed contractor will visit your property to exchange the existing meter for a replacement old meter with a valid Measurement Canada seal. The installer will knock on the door before starting the exchange, however you do not need to be home for the exchange to take place.

Please ensure that there is free and clear access to the BC Hydro meter during this time.

If the installer cannot complete the exchange because he or she cannot access the meter, a $65 failed installation fee will be added to your bill.

The replacement meter is not a smart meter but may look different than the meter currently at your home. Unlike analog meters that have mechanical dials, replacement meters will be digital. While digital meters have a digital display, they do not contain any radios and they are not radio-off smart meters. You can check what kind of BC Hydro meter is at your home by looking at the meter guide on our website bchydro.com/meterchoices.

If you have any questions about the meter exchange, please contact a Smart Metering Specialist at 1 800 409 8199. You can also find information about BC Hydro's meters at bchydro.com/smartmeters.

Sincerely,

Greg Reimer
Executive Vice President, Transmission & Distribution

BC Hydro - Meter Choices
PO Box 9530 Stn Terminal
Vancouver, BC V6B 4G8

4.0 Exhibit B-1, page 1-2

> For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. BC Hydro expects to substantially complete installation of radio-off meters for all such customers by April 2014. Accordingly, BC Hydro is applying for approval to apply these new charges effective April 1, 2014.

1.4.1 Please provide the rationale for applying for approval to apply the charges after installation is complete for all customers instead of as they are installed on a customer by customer basis?

RESPONSE:

The rationale is that it is administratively simpler and also fair to customers that have received their radio-off meters in advance of April 1, 2014 solely by coincidence with BC Hydro's installation schedule.

4.0 Exhibit B-1, page 1-2

> For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. BC Hydro expects to substantially complete installation of radio-off meters for all such customers by April 2014. Accordingly, BC Hydro is applying for approval to apply these new charges effective April 1, 2014.

1.4.2 Please provide BC Hydro's interpretation of 'substantially complete' quantitatively.

RESPONSE:

BC Hydro expects all or nearly all to be installed by April 1, 2014.

4.0 Exhibit B-1, page 1-2

> For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. BC Hydro expects to substantially complete installation of radio-off meters for all such customers by April 2014. Accordingly, BC Hydro is applying for approval to apply these new charges effective April 1, 2014.

1.4.3 Would BC Hydro seek to defer the charge if installation was not 'substantially complete' by April 1, 2014? Please explain why or why not.

RESPONSE:

No. BC Hydro continues to expect installation of radio-off meters will be substantially complete by April 1, 2014. The effective date of the BCUC approval to add the charges for having a radio-off meter allows BC Hydro to charge, as of April 1, 2014, those customers where a radio-off meter has been installed at their premises. If a radio-off meter has not been installed, the charges will not apply until the installation.

4.0 Exhibit B-1, page 1-2

> For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. BC Hydro expects to substantially complete installation of radio-off meters for all such customers by April 2014. Accordingly, BC Hydro is applying for approval to apply these new charges effective April 1, 2014.

1.4.4 Would BC Hydro seek to apply the charge earlier if installation was 'substantially complete' well before April 1, 2014?

RESPONSE:

No. Please refer to the response to CEC IR 1.4.3.

4.0 Exhibit B-1, page 1-2

> For those eligible customers who choose a radio-off meter, BC Hydro will install a radio-off meter at the customer's premises and additional charges will apply as approved by the BCUC. The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. BC Hydro expects to substantially complete installation of radio-off meters for all such customers by April 2014. Accordingly, BC Hydro is applying for approval to apply these new charges effective April 1, 2014.

1.4.4.1 Please explain why or why not.

RESPONSE:

Please refer to the response to CEC IR 1.4.1.

5.0 Exhibit B-1, page 1-3

The proposed charges for eligible customers who choose to retain a legacy meter or to have a radio-off meter installed at their premises, are as follows.

	Radio-Off Meter		
	Existing Meter: Legacy	Existing Meter: Smart[5]	Legacy Meter
Initial Charge ($)	100	155	N/A
Monthly Charge ($)	20	20	35

1.5.1 Please confirm that a customer who currently has a Legacy Meter in place has 4 main options with three possible outcomes with respect to establishing their choice including:

a) Notifying BC Hydro prior to December 1, 2013 that they wish to receive a Radio Off meter, in which case they will receive a Radio Off meter according to BC Hydro's schedule and a $100 charge in April 2014, and a $20 monthly bill charge which will continue thereafter.

b) Doing nothing, in which case BC Hydro will not replace their Legacy Meter until necessary, and they will receive an additional $35 monthly fee commencing December 1, 2013.

c) Notifying BC Hydro that they wish to keep a Legacy Meter, in which case BC Hydro will not replace their Legacy Meter until necessary, and they will receive an additional $35 monthly fee commencing December 1, 2013.

d) Notifying BC Hydro that they wish to accept a Radio On Smart Meter before December 1, 2013, in which case they will receive a Radio On Smart Meter at no additional charge.

RESPONSE:

Eligible customers have additional options that are not identified in the question. An eligible customer with a legacy or radio-off meter installed at their premises can elect the smart meter option at any time and BC Hydro will install a smart meter at the customer's premises at no additional cost. In addition, any customer can at any time request to have the meter at their premises relocated to another location on the property at their expense.

5.0 Exhibit B-1, page 1-3

3 The proposed charges for eligible customers who choose to retain a legacy meter or
4 to have a radio-off meter installed at their premises, are as follows.

	Radio-Off Meter		
	Existing Meter: Legacy	Existing Meter: Smart[5]	Legacy Meter
Initial Charge ($)	100	155	N/A
Monthly Charge ($)	20	20	35

1.5.2 Please provide the total cost of removing a legacy meter and replacing the meter with a radio off meter and include a breakdown of the labour and non-labour charges.

RESPONSE:

The cost to exchange a legacy meter with a radio-off meter will depend on the location of the installation (i.e., the Lower Mainland as opposed to a remote location) because the majority of the cost is related to travelling to the customer's premises. Based on the Meter Choices Program costs analysis included in the Application, on an average basis BC Hydro expects the cost to remove a legacy meter and replace it with radio-off meter to be as follows:

Radio Off Firmware Update @ $65 per hour ($)	**26.91**
Meter Installation Cost/Site Visit ($)	**55.00**
Total ($)	**81.91**

Note that all of the above costs are labour costs. Please refer to the responses to BCPSO IR 1.11.2 and BCSEA IR 1.9.6.

6.0 Exhibit B-1, page 1-3

> Also pursuant to Direction No. 4, BC Hydro is seeking BCUC approval of a new failed installation charge to recover the costs related to attendance at a customer's premises to install a legacy meter, radio-off meter or smart meter, as applicable, and installation is not carried out because of an objection made by a customer or an obstruction.

1.6.1 Please confirm that 'install a legacy meter' would only apply in the event of replacement of an existing legacy meter with a meter from inventory, in that BC Hydro is not permitted to install a Legacy Meter where a smart meter has already been installed, pursuant to Direction No. 4.

RESPONSE:

Confirmed.

6.0 Exhibit B-1, page 1-3

> Also pursuant to Direction No. 4, BC Hydro is seeking BCUC approval of a new failed installation charge to recover the costs related to attendance at a customer's premises to install a legacy meter, radio-off meter or smart meter, as applicable, and installation is not carried out because of an objection made by a customer or an obstruction.

1.6.1.1 If not confirmed, please explain all the circumstances under which BC Hydro might be installing a Legacy Meter.

RESPONSE:

Please refer to the response to CEC IR 1.6.1.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.1 Please provide a copy of the Smart Metering and Infrastructure (SMI) Program Business Case.

RESPONSE:

Please find the requested business case attached.

BC hydro
FOR GENERATIONS

Joanna Sofield
Chief Regulatory Officer
Phone: 604-623-4046
Fax: 604-623-4407
bchydroregulatorygroup@bchydro.com

January 18, 2011

Ms. Erica M. Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

RE: British Columbia Hydro and Power Authority (BC Hydro)
Smart Metering and Infrastructure Program Business Case

BC Hydro encloses a copy of its Smart Metering and Infrastructure Program Business Case. A copy can also be viewed at:

http://www.bchydro.com/news/press_centre/media_updates/smart_meters_vanruyven.html

For further information, please contact the undersigned.

Yours sincerely,

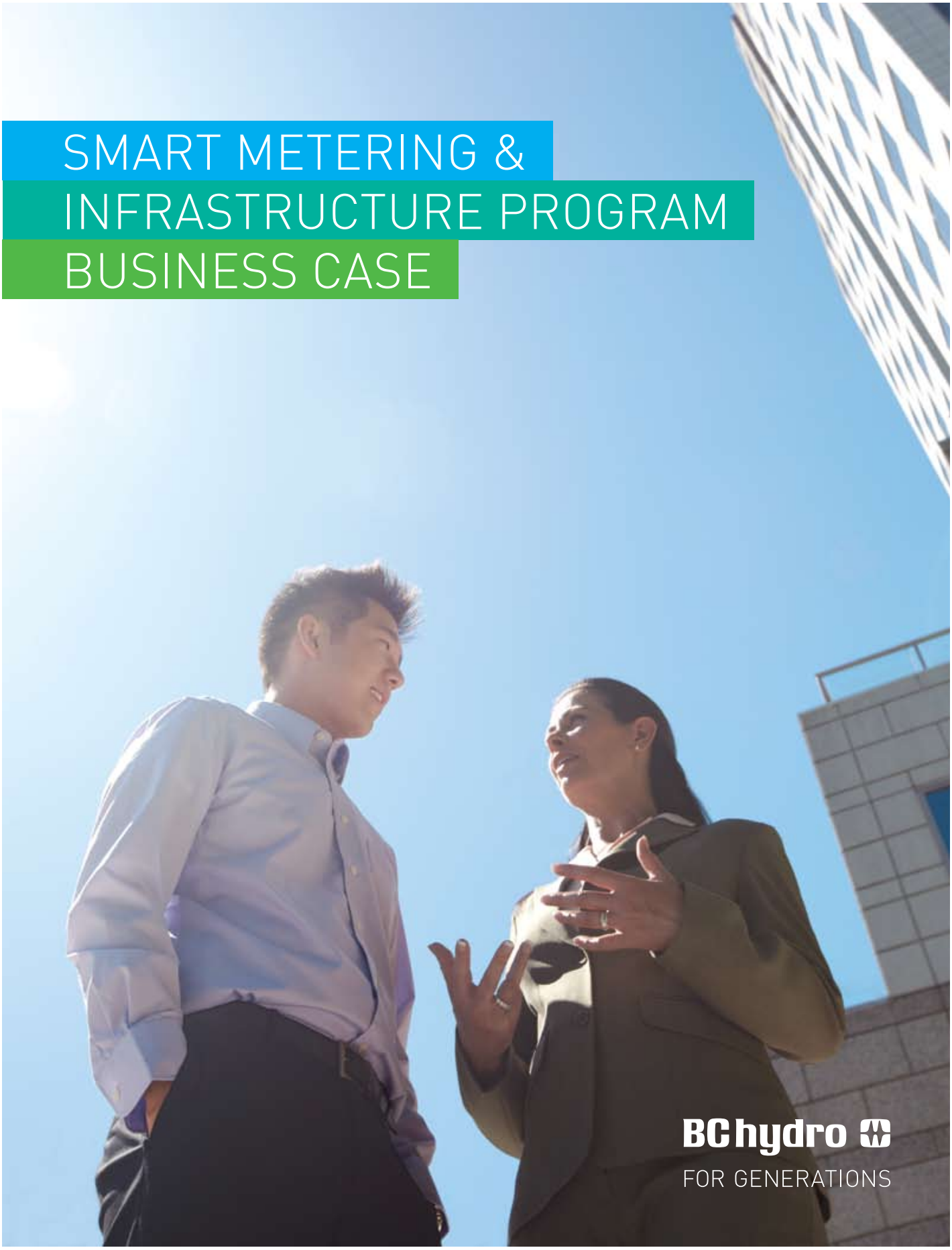
Joanna Sofield
Chief Regulatory Officer

js/af

Enclosure

Copy to: BCUC Project No. 3698500 (F09/F10 RRA) Registered Intervener Distribution List.
BCUC Project No. 3698592 (F11 RRA) Registered Intervener Distribution List.

SMART METERING & INFRASTRUCTURE PROGRAM BUSINESS CASE



BC Hydro Application for Approval of
Charges Related to Meter Choices Program

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EXECUTIVE SUMMARY

In 2011, BC Hydro will begin implementation of the Smart Metering Program. The Smart Metering Program will pay for itself through reduced theft of electricity, energy savings, and operating efficiencies.

BC Hydro's Smart Metering Program is an important foundational step in the modernization of BC Hydro's electricity system. The program involves replacing existing customer meters, now becoming obsolete, with a comprehensive smart metering system. This system includes the technology and telecommunications infrastructure needed for BC Hydro to continue to manage the electricity system in a reliable, safe and cost-effective manner.

Substantial Benefits to Customers

The Smart Metering Program will:

- **Improve safety and reliability** through faster and precise outage notification and a reduction in the damage caused by illegal electricity diversions.
- **Enhance customer service** by reporting electricity use more accurately, eliminating estimated bills, simplifying the process of opening and closing an account when moving, and reducing the need for onsite visits by field crews.
- **Reduce electricity theft** that currently amounts to approximately $100 million a year in lost revenue—costs that are borne by all legitimate BC Hydro customers.
- **Improve operational efficiency and reduce wasted electricity** through voltage optimization. Lower operating costs are passed on to all customers in rates.
- **Support greater customer choice and control** by offering optional in-home feedback tools that provide direct and timely information to customers about their electricity consumption.
- **Help modernize British Columbia's electricity system** by replacing nearly obsolete meters, and creating the foundation for supporting new uses of electricity such as electric vehicles, customer generation and microgrids.

Implementation to be Prudent and On Budget

Smart meter installation will be on time and on budget. Installation of smart meters will begin in 2011 and **will be complete by the end of 2012** with other elements of the program implemented through 2014.

Security, privacy and safety features in smart metering infrastructure will include encryption of data similar to that used by online banking systems, and mandatory criteria was included in all procurement processes to ensure only proven technologies were considered.

BC Hydro will **maintain existing rate structures** throughout the meter installation process. Any new rate structures will be subject to public consultation and review by the independent British Columbia Utilities Commission.

The BC Utilities Commission will review the prudency of BC Hydro's decisions and actions in relation to the implementation of the program.

Benefits for BC Hydro Customers Exceed Costs

The Smart Metering Program business case shows that the benefits exceed the cost by $520 million in today's dollars. These benefits are attributed to four primary areas including:

- **Operating Efficiencies—**More efficient use of distribution assets and streamlining of business processes, reducing operating and future capital expenses;
- **Energy Savings—**Lower electricity use through improved system control, operational efficiencies and providing customers with new options to better manage their electricity consumption;

- **Revenue Protection—**Includes both recovery of revenue (e.g. back-billing) and prevention of future potential revenue loss (e.g. reduced theft); and
- **Capacity Savings—**Lower electricity use at certain key periods, which reduces peak demand and capacity constraints.

Almost 80 per cent of the quantified benefits delivered through the Smart Metering Program result from BC Hydro activities. If customers take advantage of the conservation tools to be implemented by the Smart Metering Program, the overall benefits increase significantly.

Positive Net Present Value

The Smart Metering Program business case has a net present value (NPV) of $520 million through F2033. The NPV remains positive even if all costs are incurred but only the BC Hydro operational efficiencies are realized. The NPV also remains positive if all benefits are achieved at the low end of the estimated benefit range.

The following table summarizes the key financial components of the Smart Metering Program business case, resulting in the positive NPV of $520 million.

BUSINESS CASE SUMMARY IN NOMINAL AND PRESENT VALUE

Business Case Summary	Nominal Value ($M)	Present Value ($M)
Gross Benefits attributable to Smart Metering Program, less costs related to the achievement of individual benefits	$4,658	$1,629
Less: Ongoing operating and maintenance expenses and incremental asset replacement capital	(745)	(330)
Less: Smart Metering Program Costs	(930)	(779)
Total Net Value for the period F2006 to F2033	**$2,983**	**$520**

Rate Analysis

Net benefits will flow into lower rates for customers, reducing them below what they would otherwise be in the absence of BC Hydro's investment in the program.

KEY TIMELINE FOR CUSTOMERS

Stage	Timeframe	Key Activities
Program Information	**Underway and throughout the program**	Customers have access—through the BC Hydro website, bill inserts, and community events—to information about the Smart Metering Program, the smart metering system that will be installed, how it works, and other topics of customer interest. Customers can share their feedback, concerns, and interest directly through calling, email, community events, and customer research.
Installation of Smart Meters	**Mid 2011 through 2012**	Customers receive information packages before smart meters are installed in their community[1].
In-home Feedback Tools	**2012 through 2014**	Customers receive information highlighting new options available to support their energy conservation efforts. Customers receive a rebate for a basic in-home display device that can be redeemed at select stores. Customers will have access to information about their electricity use, up to the previous day, through a secure Power Smart website.

[1] Smart meter installation will begin simultaneously in communities throughout the province.

INTRODUCTION

BC Hydro was created 50 years ago to plan, build and deliver a clean, reliable supply of electricity to homes and businesses throughout our growing province. Investments in dams, generating stations and transmission and distribution networks ensured a stable supply of electricity for generations of British Columbians that followed.

Thanks to this visionary planning and investment, BC Hydro has been reliably meeting our province's growing energy needs for the last 50 years. However, vitally important elements of our electricity system infrastructure are reaching an age when significant investment is required to keep our system reliable.

At the same time that our electricity system is aging, demand for power is growing. The latest forecasts show demand for electricity in British Columbia growing by as much as 40 per cent over the next 20 years. That's the equivalent of adding five more cities the size of Vancouver to our system.

The Need for Smart Metering

Home electronics, consumer products, and manufacturing automation are just a few examples of how technology has advanced, leading to more electricity use than ever before.

The electricity system that supplies the energy to support this demand hasn't kept pace. For example, meters—the devices that measure how much electricity customers are using—have not fundamentally changed since the 1950s. In fact, the electro-mechanical meter is becoming obsolete and will soon no longer be manufactured.

Customers are using more technology than ever before.

Today, BC Hydro's meters provide a one-way flow of information (from the customer to the utility) that is very basic and not timely. For example, residential and commercial customers might be surprised to learn that BC Hydro does not know of outages until, and unless, customers call to tell us the power is out.

The electricity system must be updated to ensure that BC Hydro can continue to provide customers with safe and reliable electricity.

Modernizing British Columbia's electricity system will also ensure that advances in technology can be accommodated. Without new investment in technology and systems the 20th century electricity system will be unable to support 21st century innovations such as solar panels, electric vehicles and increased customer service options.

Utilities around the world are upgrading their electricity systems and adopting smart meters to enhance customer service, improve reliability and make their operations more efficient. By 2015, 250 million smart meters will be installed worldwide[2].

In short, investing in smart metering infrastructure is as important as renewing and reinvesting in our dams and generating facilities.

Over the next three years, BC Hydro will be investing $2 billion per year to build and renew dams, generating facilities, and transmission and distribution networks to ensure a safe and reliable supply of power continues to flow to B.C.'s homes and businesses. A key component of this investment is the Smart Metering Program.

WHAT IS THE SMART METERING PROGRAM?

Smart meters are part of an integrated program that will pay for itself through reduced theft of electricity, energy savings, and operational efficiencies. This means that over the long term the Smart Metering Program will reduce customer rates below what they would otherwise be in the absence of BC Hydro's investment in the program.

BC Hydro's Smart Metering Program is an important foundational step in the modernization of BC Hydro's electricity system. It involves replacing existing customer meters with smart meters and upgrading the technology and telecommunications infrastructure that allows BC Hydro to manage the electricity system in a reliable, safe and cost-effective manner.

The program consists of:

- Smart meters are digital meters that allow two-way communications between a customer's meter and BC Hydro through a secure connection that captures the amount of electricity consumed and when. For more information about smart meter safety, security, and privacy, see Appendix 1.
- Optional in-home feedback tools to provide up-to-date energy consumption and price information directly to residential and commercial customers providing them with more choices to actively manage their electricity use.
- Systems and infrastructure to reduce electricity theft that will help to create safer communities and mitigate rate impacts borne by legitimate customers .
- Advanced telecommunications infrastructure to allow BC Hydro to more accurately measure the actual flow of electricity through the system and support advanced electricity system management and customer applications.
- Information technology systems to integrate meter reading data into BC Hydro's customer billing, load forecasting and outage management systems.

The broad scope of the Smart Metering Program is described further in Appendix 2.

Smart meter installation will begin in 2011 and will be complete by the end of 2012. Customers will be notified in advance when the meter exchange will take place in their community. While customers do not need to be home for the meter exchange, they do need to ensure technicians have access to their current meter. There will be a brief service interruption during the meter exchange, which takes only minutes. Once smart meters are installed, customers will have the option of adopting in-home feedback tools. For example:

- Customers can choose to take advantage of incentives to purchase an in-home display device that provides near real-time information about their energy use; and
- All customers will have access to a secure website that provides prior day consumption data and other tools to analyze electricity use.

Your new smart meter will replace the existing meter on the outside of your home or in your meter bank if you live in a multi-dwelling unit. If you choose an optional in-home display, the smart meter can send real-time consumption and price information directly to you.

[2] Pike Research, November 2009

BENEFITS

BC Hydro's Smart Metering Program delivers substantial benefits to customers. Specifically, the program will:

- Improve safety and reliability;
- Enhance customer service;
- Reduce electricity theft;
- Improve operational efficiency and reduce wasted electricity;
- Support greater customer choice and control; and
- Help modernize British Columbia's electricity system.

Power line technician during a Campbell River snowstorm.

Improve Safety and Reliability

Keeping customers' power on requires BC Hydro to dispatch crews day and night, under all types of weather conditions to search for, assess, and repair faults on the electricity system. The current metering infrastructure does not provide any residential customer outage information to BC Hydro. In fact, BC Hydro is not aware of outages until customers call in to inform us that the power is out.

Due to this lack of detailed and specific outage information, field crews engage in significant travel to identify the location and cause of an outage, increasing personal risk as well as delaying restoration times. During storm season, the outages are frequently at multiple locations and the risk is even higher due to the need to drive and fly under adverse conditions.

In addition, theft of electricity is occurring in increasingly dangerous ways, posing major safety risks to the general public, first responders and BC Hydro employees through the threat of fire and electrocution. For example, in Surrey, approximately 50 per cent of marijuana growing operations inspected by the fire department involved diversion of electricity from BC Hydro distribution lines. Theft also causes strain on the distribution infrastructure resulting in an estimated 100 premature transformer failures a year.

Smart meters will decrease illegal electricity diversion (shown here), keeping neighbourhoods safe from fires like the one that destroyed this house.

Photo credit: Vancouver Fire and Rescue Services and Vancouver Police Department

The Smart Metering Program will deploy new technologies, better analysis and notification tools, and automated decision-making that will result in improved public and employee safety and shorter outage restoration times. Benefits include:

- **Faster outage notification**—Real-time outage notification provided automatically by smart meters will serve to pinpoint problems quickly and specifically, reducing the amount of travel required under adverse conditions and accelerating the restoration process.
- **Reliable restoration notification**—Allowing field crews to quickly confirm the outage has been addressed instead of driving along the electricity lines to look for secondary outage problems.
- **Reduced risk and fewer outages from electricity diversions**—By helping identify potential electricity diversions in a more consistent and automated way, the Smart Metering Program will reduce safety risks and customer outages that are caused by premature transformer failures.

Enhance Customer Service

Smart meters capture more accurate and detailed electricity use information, which will result in enhanced customer service including:

- **More accurate meter readings—**Anomalies in reported electricity use can be reconciled quickly and accurately with the use of hourly meter data rather than bi-monthly meter reads or estimated bills.
- **Elimination of estimated billing—**With smart meters in place, customer bills will be generated from actual electricity use, not from estimated readings based on profiles.
- **More streamlined moving procedures—**With automated meter reads available on request, customers can receive an accurate, up-to-date final bill and will no longer have to deal with transferring bill amounts when they move into or move out of a home or business.

Call centre agents will have more accurate information available to address customer questions related to their bills, electricity use, or opportunities for energy savings.

- **Better informed customer service representatives—**BC Hydro call centre employees will have substantially more accurate information available to address customer questions related to their bills, electricity use, or opportunities for energy savings.
- **Increased privacy and convenience—**Customers will no longer need to provide meter readers with regular access.
- **Reduced onsite visits—**Automated meter reading, automated connection services, and more information available for problem solving, will reduce the need for BC Hydro to send crews to customer homes and businesses resulting in direct savings that will be passed on to customers.

Reduce Electricity Theft

Legitimate customers bear the cost of electricity theft, which has grown significantly from approximately 500 GWh in 2006 to an estimate of at least 850 GWh today—that's enough power to supply 77,000 homes for a year and amounts to approximately $100 million a year in energy cost.

Although BC Hydro has identified over 2,600 electricity thefts over the past five years, identifying and confirming theft is a time-consuming, inefficient and expensive manual process. While BC Hydro cannot reasonably expect to eliminate all electricity theft, augmenting the current manual process with new technology will substantially reduce current levels of theft by:

- **Theft detection—**New distribution system meters (different from those to be installed at customer homes or businesses) located at key points on BC Hydro's system will measure electricity supplied to specific areas. Combined with software tools to enable electricity balancing analysis, distribution system meters will help BC Hydro identify electricity theft more accurately and address it more quickly.
- **Tamper detection—**Smart meters have a tamper detection feature that automatically notifies BC Hydro if they have been removed from the wall or otherwise manipulated.

Electricity theft results in higher rates for legitimate customers.

Reducing electricity theft delivers tangible financial benefits through increased revenue, revenue recovery (e.g. back-billing), and reduced cost of energy.

Improve Operational Efficiency and Reduce Wasted Electricity

Currently, BC Hydro transmits more electricity than needed by customers to ensure there is acceptable power quality delivered to every customer. Reducing wasted electricity benefits all customers through lower operating costs.

The amount of excess energy required can be substantially reduced with better monitoring and control over the distribution system including:

- **Voltage optimization—**Use voltage information collected from smart meters to make existing electricity control devices (voltage regulators, capacitor banks, and transformers) along the distribution system more efficient. Simply put, less electricity will be required to be transmitted to maintain expected power quality, resulting in less electricity having to be generated or purchased, which in turn, lowers costs.
- **Efficiencies in meter reading, meter sampling, distribution system maintenance, outage management, and load research—** Will significantly reduce operating costs.

Support Greater Customer Choice and Control

Today, customers have few tools to manage their electricity use because the current meters do not capture enough information. Without specific and timely information, it is difficult for customers to take advantage of new service options or make informed decisions to actively manage electricity in their own circumstances.

Research has shown that electricity is typically not something customers regularly think about, and that increasing customer awareness by enabling them to view their own consumption in a timely manner can achieve electricity savings of up to 15 per cent. See Appendix 3 for more information related to research.

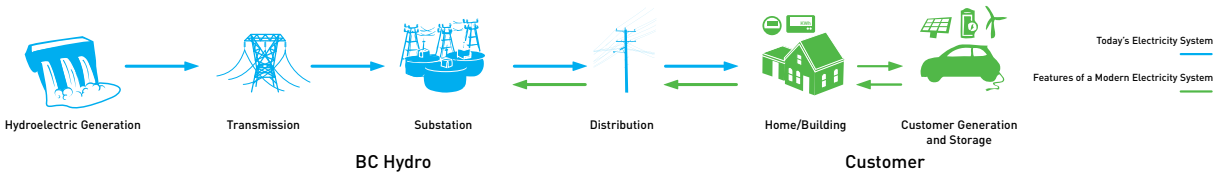
More information and control will help customers to save money—and help to achieve BC Hydro's goal of meeting two-thirds of incremental electricity demand through conservation by 2020.

The Smart Metering Program will enable customers to have greater choice and control of their energy use through:

- **Optional in-home feedback tools—**BC Hydro will provide incentives for customers to adopt market available in-home displays, programmable thermostats, and energy management software products.
- **Power Smart website—**Customers will also have the option of accessing their own secure consumption information through BC Hydro's expanded Power Smart website.

Optional in-home feedback tools will provide customers with more choices and control.

- **Rate Options—**Smart meters capture information that will enable BC Hydro to design new rate structures that encourage conservation during peak periods, such as voluntary time-of-use. The design of these rates will involve consultation with customers and will be subject to review and approval by the BC Utilities Commission.



Help Modernize BC Hydro's Electricity System

BC Hydro's electricity system, including the current base of electromechanical meters, has changed very little over the past 50 years. These older style meters are becoming obsolete, as meter vendors switch to producing smart meters.

Upgrading to a smart metering system is a key foundational step in modernizing BC Hydro's overall electricity system. Additional measurement points throughout the electricity system combined with the ability to measure electricity to and from a customer site will enable:

- **Support for new customer applications—**Advanced telecommunications infrastructure will support advanced electricity system functions and emerging applications like customer generation and microgrids.
- **Support for large-scale clean energy initiatives—**Implementation of smart metering and network operations functions will help BC Hydro to manage new uses for the electricity system such as electric vehicles, electrification of public transportation, community-based generation, and integration of renewable fuel sources. For example, with a more modern electricity system, customers who invest in solar panels, or other clean sources of electricity, could sell excess power back to BC Hydro, or draw electricity from their electric vehicles during a power outage.

With a more modern electricity system, customers who invest in solar panels, or other clean sources of electricity, could sell excess power back to BC Hydro.

FINANCIAL ANALYSIS

The Smart Metering Program business case, originally developed beginning in 2006, was most recently updated in December 2010 and reflects updated benefit assumptions as well as increased cost certainty as a result of the procurement activity during 2010. This section summarizes the benefits, costs, and net present value included in the business case.

Quantified Benefits

The Smart Metering Program business case includes approximately $1.6 billion in quantified benefits (present value), to be realized over 20 years. These benefits are attributed to four primary areas including:

- **Operational Efficiencies—**More efficient use of distribution assets and streamlining of business processes, thereby reducing operational and future capital expenses;
- **Energy Savings—**Lower electricity use through improved distribution system control, efficiencies and reduced consumption by customers;
- **Revenue Protection—**Includes both recovery of revenue and prevention of future potential revenue loss through reduced theft; and
- **Capacity Savings—**Lower electricity use at certain key periods, which reduces peak demand and capacity constraints.

Almost 80 per cent of the quantified benefits delivered through the Smart Metering Program result from operational efficiencies within BC Hydro. If customers take advantage of the conservation tools offered through the program, the overall benefits increase significantly. Additional information regarding each specific benefit stream, including key assumptions, is provided in Appendix 4.

In addition to the quantified benefits, the Smart Metering Program will deliver numerous other benefits that have not been quantified in this business case or cannot be monetized. A summary of these additional benefits can be found in Appendix 5.

The operational savings delivered by the Smart Metering Program will benefit all BC Hydro customers. As a publically-owned cost-recovery utility, all benefits realized by BC Hydro are passed on to customers and will be reflected in rates. In addition, customers will not be billed separately for the cost of the new smart meters.

TABLE 1: PROGRAM BENEFITS AS OF DECEMBER 2010—IN PRESENT VALUE

Type of Benefit	Description	Expected Benefit ($ Million)	Sensitivity Range[3] ($ Million)
Operational Efficiencies, Avoided Capital	Meter Reading Automation	$222	$182–$247
	Meter Sampling	$61	$56–$66
	Remote Re-connect Automation	$47	$42–$52
	Distribution Asset Optimization	$15	$12–$25
	Outage Management Efficiencies	$10	$5–$15
	Continuous Optimization and Load Research	$6	$2–$10
	Call Center & Billing	($2)	($4)–$0
Energy Savings	Voltage Optimization—Commercial Customer Sites	$108	$48–$148
	Voltage Optimization—Distribution System	$100	$85–$150
Revenue Protection	Theft Detection	$732	$632–$832
Derived from BC Hydro Operational Efficiencies (~80%)		**$1,299**	**$1,060–$1,545**
Capacity Savings	Voluntary Time-of-use Rates	$110	$30–$250
Energy Savings	Conservation Tools (in-home feedback tools)	$220	$170–$270
Increased Customer Conservation (~20%)		**$330**	**$200–$520**
Total Quantified Benefits		**$1,629**	**$1,260–$2,065**

Benefits Realization

The Smart Metering Program is a large and complex project designed to deliver significant benefits from across several business groups at BC Hydro. The benefits described in this business case pay for the investment in the program. BC Hydro is implementing a formal benefit realization framework, base-lined with the benefit streams identified in this business case, to ensure accountability and transparency in the measurement and reporting of the benefits over time.

[3] Sensitivity ranges identified for each benefit bracket the probable benefit outcomes. The ranges are based on an assessment of the upside and downside in variability associated with the key drivers behind each benefit.

TABLE 2: SMART METERING PROGRAM BUDGET

			$ millions
Initiation Phase (Completed F2007)			**1.4**
Identification Phase (Completed F2008)			**8.9**
Definition Phase (Completed F2011)			**38.8**
Implementation Phase (F2011–F2014)			
Smart Metering System			
	Architecture and Design	8.6	
	Assets: Smart Meters, Telecommunications, Software	256.0	
	Deployment Activities	126.5	
Sub-Total: Smart Metering System			**391.1**
Solution Integration (Information Technology)			
	Architecture and Design	3.2	
	Assets: Meter Data Management System and Other Applications	7.9	
	Implementation Activities	49.8	
Sub-Total: Solution Integration (Information Technology)			**60.9**
Theft Detection			
	Architecture and Design	2.6	
	Assets: Distribution System Meters, Application Software	62.7	
	Deployment Activities	45.2	
Sub-Total: Theft Detection			**110.5**
Conservation Tools			
	Architecture and Design	2.4	
	Assets: In-Home Displays, Website, Software Supporting Rates	18.4	
	Rebate Program	42.0	
Sub-Total: Conservation Tools			**62.8**
Grid Modernization Infrastructure Upgrades			
	Architecture and Design	1.9	
	Assets: Advanced Telecom Devices and Applications	33.0	
	Deployment Activities	19.3	
Sub-Total: Grid Modernization Infrastructure Upgrades			**54.2**
Program Delivery Activities			
	Project Management and Controls	22.2	
	Safety, Security, Privacy Governance	1.1	
	Finance and Regulatory	2.4	
	Customer Research, Engagement and Outreach	8.6	
	Contract Management	2.7	
Sub-Total: Program Delivery Activities			**37.0**
Sub-Total: Implementation Phase			**716.5**
Interest During Construction			**14.4**
Contingency			**60.0**
Sub-Total			**840.0**
Reserve Subject to Board Control			**90.0**
Total: Program Authorized Amount			**930.0**

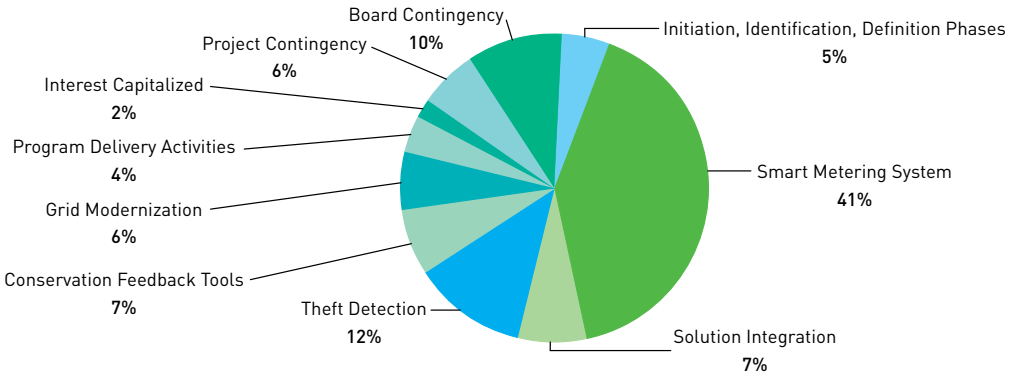


FIGURE 1: BUDGET COMPONENTS BY PERCENTAGE WITH SPECIFIC FOCUS ON THE IMPLEMENTATION PHASE

Program Costs

The total Authorized Amount for the Smart Metering Program is $930 million (nominal value) including contingency. The budget was developed using BC Hydro's standard project planning methodology, and is organized into four major phases (see Glossary for definition of phases):

- **Initiation Phase—**Completed in F2007
- **Identification Phase—**Completed in F2008
- **Definition Phase—**Completed in F2011
- **Implementation Phase—**Scheduled to be fully completed in F2014, with the installation of customer meters on track for the December 2012 date as legislated by the Province of British Columbia.

Net Present Value

The Smart Metering Program business case shows a net present value (NPV) of $520 million through F2033. The NPV remains positive even if all costs are incurred and only the BC Hydro operational efficiencies are realized. The NPV also remains positive if all benefits are achieved at the low end of the estimated benefit range. A more detailed discussion of the business case analysis can be found in Appendix 6.

The positive NPV of the Smart Metering Program will benefit all BC Hydro customers. These net benefits will flow, over time, into lower rates for customers, reducing them below what they would otherwise be in the absence of BC Hydro's investment in the program. See Appendix 7 for a discussion of the Smart Metering Program rate analysis.

RISKS

BC Hydro has put in place a Risk Management process to identify, assess, and mitigate risks that could significantly impact the Smart Metering Program. Appendix 8 provides a summary of the key risks and mitigation strategies. The procurement process employed by the program has also played a significant role in mitigating technology, cost, and schedule risk. More information about how BC Hydro has managed risk through procurement can be found in Appendix 9.

LESSONS LEARNED FROM OTHER JURISDICTIONS

BC Hydro has also managed risk through learning from others. By adopting smart meters after learning from the experience of other utilities, BC Hydro has the advantage of knowing what factors contribute to successful implementation and benefit realization. Some of these key learnings are included in Table 3.

TABLE 3: SUMMARY OF LESSONS LEARNED FROM OTHER JURISDICTIONS

Program Element	Experience of other utilities	Our approach
Technology	Some utilities were adopters of early smart metering technology which had limited capabilities and ultimately had to be replaced.	BC Hydro is taking advantage of the fact that metering technology has stabilized, and technology standards are now more open, robust and secure. BC Hydro is actively involved in numerous industry standards and policy groups as outlined in Appendix 10. BC Hydro has also included mandatory criteria in procurement packages to ensure only proven and scalable technology would be considered.
Meter Accuracy	In some jurisdictions, questions were raised about meter accuracy. Ultimately, it was determined that events such as heat waves occurring at the same time as meter installation were the main factors in perceived inaccuracies. Testing has confirmed smart meters are more accurate than electro-mechanical meters.	BC Hydro is governed by the testing requirements established by Measurement Canada, a federal agency. The installed base of meters in Canada has a very high degree of accuracy due to regular random testing.
Rates	Several utilities have chosen to implement time-of-use rates at the same time as smart meter installation, resulting in higher bills for customers.	BC Hydro will maintain existing rate structures at the same time as meter installation. BC Hydro will engage customers in the design of any new rate structures and any new or modified rates will be subject to review and approval by the BC Utilities Commission.
Customer Choice and Support	Some utilities provided few in-home feedback options and provided limited transactional information through their call centre, not offering customers adequate meter installation information or support for conservation efforts.	BC Hydro will offer incentives for customers to adopt conservation tools such as in-home displays that will provide near real-time feedback, and a secure web page that provides next day consumption data, with tools to help analyze patterns. Trained call centre agents will be available to answer specific customer questions during the meter installation period, and to provide advice on how to maximize conservation savings through the use of new in-home feedback tools when they become available.
Security and Privacy	In some cases, privacy and security considerations were implemented as an afterthought.	Privacy, security and safety features were key evaluation criteria in all procurement processes related to the Smart Metering Program. Privacy-by-Design and Security-by-Design processes are used for all design, development, and implementation activities. BC Hydro also has active and ongoing involvement with industry standards and policy groups, including those focused on security, privacy and safety standards.

KEY TIMELINE FOR CUSTOMERS

A key lesson learned from other smart meter initiatives is the importance of communication with customers. Accordingly, BC Hydro has developed a proactive approach to ensure open and frequent customer engagement. The following table provides highlights from the Smart Metering Program's customer engagement approach.

TABLE 4: KEY TIMELINE FOR CUSTOMERS

Stage	Timeframe	Key Activities
Program Information	**Underway and throughout the program**	Customers have access—through the BC Hydro website, bill inserts, and community events—to information about the Smart Metering Program, the smart metering system that will be installed, how it works, and other topics of customer interest. Customers can share their feedback, concerns, and interest directly through calling, email, community events, and customer research.
Installation of Smart Meters	**Mid 2011 through 2012**	Customers receive information packages before smart meters are installed in their community[4].
In-home Feedback Tools	**2012 through 2014**	Customers receive information highlighting new options available to support their energy conservation efforts. Customers receive a rebate for a basic in-home display device that can be redeemed at select stores. Customers will have access to information about their electricity use, up to the previous day, through a secure Power Smart website.

[4] Smart meter installation will begin simultaneously in communities throughout the province.

APPENDIX 1: SMART METER SECURITY, PRIVACY AND SAFETY

Security, privacy and safety have been considered key priorities throughout the development of the Smart Metering Program. The program redefines many of the existing business processes—and introduces new ones—requiring that security, privacy and safety are embedded in each and every aspect. The basic principles of Security-by-Design, Privacy-by-Design and Safety-by-Design have been incorporated throughout the planning of the program. Each of these disciplines are also intrinsically linked; for example, ensuring a security objective is achieved also enhances safety and privacy.

Procurement

Security, privacy and safety requirements are included throughout all of the Smart Metering Program Requests for Proposals (RFPs). Examples of specific requirements include:

- Ensuring vendors are provided with all BC Hydro safety standards and Smart Metering Program security and privacy specifications.
- BC Hydro's Safety-by-Design Practice referenced as a specification. Examples include the metering system specifications explicitly referencing:
  - Applicable American National Standards Institute (ANSI) and Institute of Electrical and Electronics Engineers (IEEE) safety standards; and
  - Generation Project and Service Delivery Practices: Safety-by-Design.
- In RFPs, proponents are required to describe their safety programs and how they propose to comply with BC Hydro safety principles.
- Vendors are required to document, in detail, how their solutions to smart metering security standards demonstrate security best practices.
- Security penetration testing is a mandatory deliverable before implementation of each component of the solution.
- Field Operations Safety and Work Methods staff members participated in vendor evaluation sessions where worker safety practices were thoroughly reviewed. This involvement will continue for future procurements associated with smart metering field devices and related work methods.
- Enhanced meter safety and security design criteria was included in the metering system RFP.

Security in the Smart Meter and Smart Metering System

There are a number of security and safety features within the smart meters themselves, including:

- Use of the end-to-end 128-bit Advanced Encryption Standard (AES) algorithm, which is the same as typical online banking systems;
- Use of an asymmetric key algorithm, which ensures the smart meter cannot read any information it generates once that information has been encrypted. This also means that a specific smart meter can not access or read any data generated by another smart meter; and
- Limited historical data is stored on the smart meters mitigating any exposure of a customer's private data. Additionally, BC Hydro has privacy requirements in place to ensure that employees protect the privacy of customers in accordance with the *Freedom of Information and Protection of Privacy Act*.

There are also security and safety features inherent in the smart metering system:

- Home Area Network (HAN) components, such as in-home display devices, utilize a secure communication system that works only for the local network (i.e. the specific home). Nearby in-home display devices will not be able to access information from another device.

- The smart metering deployment architecture is designed to use different access keys for each localized area to ensure the overall system remains secure—essentially, the smart metering system is broken up into many isolated units. Gaining access to one isolated unit does not provide access to the whole. In other words, devices with a localized area key do not have access to the entire network and no one device is capable of accessing the entire electricity system.
- When a customer moves to a home with an existing smart meter, BC Hydro will ensure that all current in-home device connections are cleared so that usage information from the previous home owner stays private.
- Field tools, used to configure smart meters when remote configuration is not possible, are managed through a secure isolated network. Access to field tools will be limited to necessary staff members using unique passwords. Field tools also carry limited customer meter data and will be purged after each use.

Smart Meter Privacy

- The Smart Metering Program has been focused on privacy concerns since its inception. BC Hydro's Freedom of Information Coordination Office (FOICO) has been central in the discussion of privacy-related issues and participated in all aspects of the requirements and RFP phases of the project.
- In addition to FOICO, resources with expertise in privacy are assigned to the Smart Metering Program to assess and ensure that privacy requirements are met through the life of the program.
- A Privacy Impact Assessment (PIA) is completed for the entire Smart Metering Program, each individual release, and specific security or privacy sensitive components. In all, more than thirty PIAs are anticipated and each PIA will require FOICO sign-off to ensure privacy requirements are effectively managed throughout the program.
- Security and privacy frameworks are being developed for each release of the program to ensure that BC Hydro standards for security and privacy meet or exceed compliance requirements and future expectations.

Smart Meters and Radio Frequency Safety

Smart meters will use radio frequency to communicate data to and from BC Hydro. The health effects of the frequencies employed have been thoroughly investigated by BC Hydro. In addition, many reputable health authorities such as the World Health Organization and Health Canada have conducted thorough reviews of all the different types of studies and research on electromagnetic fields and health. These health authorities have examined the scientific weight-of-evidence and have determined that when all of the epidemiological and experimental studies are considered together, the consensus is that there is no cause-effect relationship between exposure to electromagnetic fields and human health.

Specific to radio frequency exposure to the public, proposed Field Area Network devices must be certified by Industry Canada and in compliance with Health Canada's Limits of Exposure to Radio Frequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz [Safety Code 6]. BC Hydro will continue to monitor research related to radio frequency. General information and resources related to electromagnetic fields can be found on BC Hydro's website at: **bchydro.com/safety/electric_magnetic_fields/magnetic_fields_and_health.html.**

BC Hydro will collaborate with customers who are concerned about radio frequency with the objective of identifying solutions that can be mutually supported.

There are three key factors that contribute to radio frequency safety: duration of the signal, signal strength and distance from the signal.

1. **Signal Duration**
   While the period during which a smart meter transmits data back to BC Hydro will vary depending on the specific metering system used, transmission is expected to last for only a few minutes per day.

2. **Signal Strength**
   The signal strength emitted by a smart meter is considerably less than visible light and exposure common to everyday living, such as laptops, cell phones and handheld radios. For example, if you are standing adjacent to the smart meter and it is transmitting continually for those few minutes, exposure is between 60 times and 600 times below the acceptable level identified in Safety Code 6.

3. **Distance from the Signal**
   Smart meters will be located in the same place as the existing meter on the outside of a customer's home, or in a meter bank in multi dwelling units such as town homes, condominiums or apartment buildings.

Standing 3 metres (10 feet) away from the meter while it is transmitting, exposure drops to 60,000 times to 600,000 times below the Safety Code 6 acceptable level. Excluding the built in safety factor in Health Canada's Safety Code 6, standing adjacent to a smart meter device, the radio frequency radiation is 60 times less than the Safety Code 6 acceptable level. This is assuming the smart meter device is transmitting 100 per cent of the time, which it does not.

Some customers have expressed concerns about the potential effect of radio frequencies on their unique personal health condition. Individuals who have concerns or questions are invited to contact us at **smartmeters@bchydro.com**.

The following table compares the radio frequency generated by items common to everyday life.

DEVICE RELATIVE POWER DENSITY IN MICROWATTS PER SQUARE CENTIMETRE ($\mu W/cm^2$)

Distance from the Signal	Signal Strength
FM radio or TV broadcast station signal	0.005 microwatts
Smart meter device at 3 metres (10 feet)	**0.01 microwatts***
Cyber cafe (Wi-Fi)	10–20 microwatts
Laptop computer	10–20 microwatts
Cell phone held up to head	30–10,000 microwatts
Hand-held radio at head	500–42,000 microwatts
Microwave oven, 5 cm (2 inches) from door	5,000 microwatts
Summer sunlight at earth's surface	100,000 microwatts

*Adjacent to meter <10 microwatts

Design and Operation of Equipment

BC Hydro's Safety-by-Design practice addresses the design and operation of new and existing equipment throughout the system including:

- Safe placement of equipment in energized locations (e.g. collectors requiring a power source);
- Safe operation of equipment (e.g. vehicles used for deployment); and
- Designing new components (e.g. integration of distribution system meters) from a safety perspective.

An important component of the Smart Metering Program since 2008 has been the engagement of other utilities and research bodies throughout North America (e.g. Pacific Gas & Electric) to understand their safety challenges and experiences. BC Hydro is an active member of several industry groups where the focus is safety, security, and privacy standards.

BC Hydro has anticipated a possible risk of violence related to electricity theft from drug operations during the installation of smart meters. Measures to protect both employees and the public include:

- The establishment of a police coordination program;
- The development of policies to ensure employees do not engage in unsafe situations; and
- Violence risk assessment training for all installation technicians.

Internal Procedures

Internal procedures have been reviewed from a safety, security and privacy perspective. An outcome of this review is the development of enhanced and new training programs to reinforce safety awareness and safe work practices. Examples include:

- A Safety-by-Design Project Hazard Matrix will be implemented for all planned technologies and the physical placement of meters, telecommunications components and system meters.
- Standards design work is underway with the Distribution Engineering Standards department for the safe and secure placement of telecommunications components.
- Meter installer training programs will be reviewed by the BC Hydro Work Methods department and scrutinized for compliance with safe work practices.
- Mandatory safety requirements and qualifications for meter installation proponents include compliance with WorkSafeBC and the *Safety Standards Act*, with a specific focus on vehicle safety, and provision for safety audits of the installation work.
- Project team members are trained in, and will adhere to, applicable BC Hydro safe work practices in our field and laboratory environments.

Industry Standards Development

BC Hydro is participating in the National Electric Energy Testing Research and Applications Center (NEETRAC), testing and developing meter service connect/disconnect standards with respect to performance and safety. As part of BC Hydro's metering system procurement process vendors must provide formal documentation related to their compliance with the testing requirements and acceptance criteria of NEETRAC. Further, BC Hydro is working as a member of an American National Standards Institute committee on advancing service connect/disconnect standards. BC Hydro's commitment to service switch safety will enhance the safety of both customers and workers.

APPENDIX 2: PROGRAM SCOPE

For the past four years, BC Hydro has been defining the scope and approach for the Smart Metering Program. Key activities include:

- Developing a detailed set of specific functional, operational and technical requirements captured in a set of comprehensive use cases described later in this section.
- Actively participating in technology and industry standards groups focused on smart metering and the emerging smart grid sectors to ensure BC Hydro business needs are captured in industry standards.
- Monitoring the progress and results from utilities who were early implementers of smart metering projects—including Pacific Gas & Electric, Southern California Edison, San Diego Gas & Electric, Duke Power, ENEL (Italy), and in Ontario—Hydro One, Toronto Hydro—and incorporating their "lessons learned" into BC Hydro's project planning.
- Tracking the market evolution of metering technologies, software products, and in-home energy management offerings to ensure BC Hydro's solution choices are based on proven, secure technologies.

The activities listed above resulted in the final Smart Metering Program scope which includes the following six major components. Each will be managed and implemented as part of a single, integrated program:

Smart Metering System—Captures and communicates consumption data and meter events, such as outages, to both the customer and BC Hydro;

Solution Integration—Designs, develops, and implements the software components, business processes, and ongoing support structures required to enable smart metering capabilities;

Theft Detection—Enables BC Hydro to better localize sources of electricity diversion;

Conservation Tools—Provide information enabling customers to make informed and timely decisions in relation to their electricity consumption;

Grid Modernization Infrastructure Upgrades—Provide the smart meter operations centre, and advanced technology and telecommunications infrastructure, to help improve the reliability and security of the electricity system; and

Program Delivery Activities—Provide the overall project management activities and responsibilities designed to ensure a quality implementation of each solution component included in the program scope.

Following is a more detailed description of each scope component.

Smart Metering System

Included as part of the Smart Metering System[5] are:

- **Smart Meters—**Digital meters—capable of two-way communications—with the ability to measure the incoming and outgoing flow of electricity from a specific location such as a customer's home or business. The two-way communication capability enables smart meters to provide use data to both customers and BC Hydro—in different formats. When paired with an in-home display, the smart meter can send real-time consumption and price information directly to the customer. Real-time customer use information will be transmitted through the Home Area Network directly to the customer and will not be available to BC Hydro. Smart meters will capture and store use on an hourly basis and transmit the data back to BC Hydro, through the Field Area Network and Wide Area Network, during short intervals (couple of minutes) at prescheduled times during the day.
- **Metering Telecommunications—**Consisting of two parts—the Field Area Network (localized to meters in the field) and the Wide Area Network connections (enterprise wide focus)—this communications infrastructure provides the physical devices required to enable two-way transmission of data between smart meters and BC Hydro. There are several different ways this field-based communications infrastructure can be implemented, depending on the metering system selected.
- **Automated Data Collection System—**This software application is designed to aggregate meter usage and event data from smart meters and manage the Field Area Network communications infrastructure. This software is provided by the metering system vendor.

[5] BC Hydro is currently in an active procurement process to select the Metering System vendor.

Solution Integration

In addition to the overall smart metering system, the Smart Metering Program is responsible for the business environment that supports smart metering including implementation of new business software applications, changes to existing information systems, enhanced data warehouse and analytics capabilities, and all of the business transformation activities that will help BC Hydro adapt to the new technologies and systems. Specific elements of scope include:

- **Meter Data Management System—**A software application that stores, validates, edits and analyses meter reading data prior to releasing it for integration into other BC Hydro operational systems such as customer billing, load forecasting and outage management.
- **Interfaces and Integration—**This systems integration work involves modifying existing applications to handle the enhanced automated meter reading information, and building interfaces between new and existing enterprise applications to support BC Hydro's end-to-end business processes.
- **Business Transformation—**The major elements of business transformation work involve development of new and modified business processes, design of organizational and job changes, rollout of training and knowledge management programs, employee engagement to facilitate cultural change, and effective transition to business operations for ongoing work.

Theft Detection

BC Hydro currently does not have the measurement devices and analytical tools to quickly and accurately identify where theft of electricity is occurring. A comprehensive theft detection solution, based on electricity balancing analysis, will be implemented as part of the program. Scope elements include:

- **Distribution System Meters—**New meters (different from those to be installed at customer homes or businesses) will be installed at key points on BC Hydro's system to measure electricity supplied to localized areas.
- **Theft Analytics—**A suite of software tools that support enhanced electricity network modeling methods, as well as the business rules required to analyze measurement data captured from new distribution system and smart meters.

Conservation Tools

Smart meters will enable customers to take advantage of new tools to save energy and money. These include:

- **In-home Display—**Customers will have the choice of whether or not they wish to acquire in-home display devices. BC Hydro will provide financial incentives to enable customers to acquire a basic market available in-home display device from their local retailer. In-home displays will be enabled through the Home Area Network, a communication channel between the smart meter and the customer's home or business. This secure channel, an attribute of the smart metering system, enables customers to view their consumption either on a real-time or accumulated basis, represented in both cost and kilowatt-hours.
- **Power Smart Website—**BC Hydro's existing secure Power Smart website will be expanded to include new interactive and informative applications—based on the hourly data captured from smart meters—designed to help customers better understand and model their energy use. Today, residential customer meters are read every two months, which provides little practical information for customers to determine which, if any, conservation actions they should pursue.
- **Rate Options—**The smart metering system infrastructure will enable BC Hydro to design new rate structures that encourage conservation during peak periods. While the implementation of new rates is enabled by the Wide Area Network, Field Area Network and web interface, the design and implementation of new rate structures is a separate initiative. Key functional and data requirements to support rate options will be enabled by the new smart metering system and the Meter Data Management System. The design of these rate options will involve consultation with customers and key stakeholders, and will be subject to full review and approval by the BC Utilities Commission.

Grid Modernization Infrastructure Upgrades

This program scope element involves two key components; the specific requirements of each will depend on the metering technology selected:

- **Advanced Telecommunications Infrastructure—**Involves the design and installation of additional secure and reliable Wide Area Network telecommunications infrastructure to support advanced electricity system functions and emerging customer applications like customer generation and microgrids.
- **Advanced Operational Support—**Involves the implementation of a smart metering and network operations function to support real-time operations of the metering system. This support function will likely be implemented as an extension of BC Hydro's distribution operations centre so that all real-time system and telecommunications operations can be managed seamlessly and efficiently.

Program Delivery Activities

Included in the scope of the Smart Metering Program are the overall program delivery activities and services which ensure all of the technical aspects of the project are successfully implemented, and accepted by BC Hydro's customers and stakeholders. These activities include:

- **Project Management and Controls—**Includes the personnel and support tools to manage and report on the overall delivery of all aspects of the Smart Metering Program, including scope, schedule, budget, quality, issues resolution, environment management, and transition to operations.
- **Security, Privacy and Safety—**This independent team ensures appropriate governance and compliance for all the physical security, cyber security, data privacy, and employee, vendor and contractor safety aspects of the program. Security, privacy and safety have been fundamental drivers of the program.
- **Finance & Regulatory—**This team provides financial oversight and regulatory support to the project team.
- **Customer Research, Engagement and Outreach—**Includes the resources required to support the Smart Metering Program with respect to research, community engagement, customer communications, employee engagement, and media.
- **Contract Management—**Includes the personnel and processes required to manage procurement and tendering activities, as well as manage contractual commitments and any contract issues that may emerge.

Use Cases

Use cases provide a starting point to inform the scope of complex, cross functional projects, and define the subsequent procurement requirements. Use case methodology is an industry-leading approach to matching functional needs to the appropriate technology and systems.

BC Hydro examined use cases from other utilities across North America involved in smart metering systems. From there the approach was expanded to create 17 individual use cases based on BC Hydro's unique business needs and context. For example, BC Hydro's requirements included enhanced customer service options and theft detection. The inclusion of these requirements improved program benefits and contributed to a stronger business case.

Organized into four main categories the use cases include: Customer Service, Distribution System Optimization, Home Area Network and in-home feedback, and network and meter management. Based on business scenarios the use cases capture the current and long-term (over 20 years) functional, operational and technical requirements for BC Hydro.

Category	Use Cases	Description
Customer Service	Customer Contact Collect Interval Data Remote Connect or Disconnect Pre-pay Services Bill an Account	These use cases describe the functional requirements and business processes required to achieve enhanced customer services through improved communications, more accurate account billing, automated meter data collection, remote connect and disconnect services, and new service offerings such as pre-paid options. Customer Service Representatives will be better equipped to handle all customer requests regarding account enquiries, billing and payments, as well as help customers to monitor and adjust their energy consumption.
Distribution System Optimization	Extending or Reconfiguring the Distribution System Analyzing Meter Data for Load Research, Planning and Rates Detection of Tampering or Theft Distribution System Optimization and Automation Outage Detection and Restoration Customer Generation	These use cases describe the functional requirements, business processes, and operational aspects required to optimize the distribution system with respect to implementation of a new smart metering system. This includes the impact on BC Hydro's network design and engineering processes to incorporate new features and capabilities. Current and historical data captured through the Meter Data Management System includes accumulated energy consumption, demand profiles, aggregated time-of-use information, voltage information, and metering events (e.g. tamper flags). This more detailed and timely information supports several distribution system business processes including outage detection and analysis, theft identification and mitigation, and customer generation.
Home Area Network	Home Area Networks Providing Demand Side Management Capabilities Plug-in Hybrid Vehicles	These use cases describe the functional and technical requirements, and the business processes required to enable a Home Area Network using new smart meters and various in-home feedback tools. This may include providing pro-active notifications to customers if they choose, and the ability to accommodate electric vehicles on the distribution network. As customers, especially industrial and commercial customers, become more interested in direct load control, they can use demand response capabilities included in the Smart Metering Program to configure, manage, monitor and settle various load programs.
Network and Meter Management	Meter Lifecycle Management Management and Recovery of the System Installation and Configuration of the System	These use cases describe the requirements to configure, manage, recover and maintain the various metering units within the product lifecycle. A typical life cycle of a smart meter is described, including the installation, replacement, and remote troubleshooting methods involved. Described within these use cases is the initial installation and configuration of the smart metering system including meter procurement, quality assurance testing, logistics and installation.

APPENDIX 3: RESEARCH

In addition to applying lessons learned from other utilities, BC Hydro has reviewed research findings, conducted customer research, and field tested theft detection devices to assist in shaping the delivery of the Smart Metering Program. Key results are included below.

Research on Energy Conservation Effectiveness of In-home Feedback

BC Hydro has estimated that customers who use in-home feedback tools will realize an average 4 per cent energy savings. This estimate is considered to be conservative, based on various research findings, as outlined below.

Research in relation to the effectiveness of in-home feedback tools includes both academic research related to behaviour change and actual pilots and trials that have been conducted worldwide. This research has informed the savings assumption above, as well as the overall approach BC Hydro will be taking related to in-home feedback. Key research findings have found that saving from direct and indirect feedback can range from 3–15 per cent and 0–10 per cent respectively[6].

Specific industry initiatives have also provided a point of reference for potential energy conservation for the Smart Metering Program. For example, customer energy conservation has been reported as follows:

- Pacific Gas & Electric states an average 6.5 per cent reduction in energy use when using an in-home display[7],
- Southern California Edison reports a 6.5 per cent reduction in energy use when using Home Area Network devices and a 2 per cent reduction in energy when using historical online feedback[8], and
- Commonwealth Edison reported a 2 per cent reduction in energy use when customers subscribed to monthly online reports[9].

Research on Customer Participation for In-home Feedback

Customer participation will depend on several factors, including the cost of in-home feedback tools, their overall appeal and simplicity of use, the marketing campaign that supports their distribution, and their effectiveness in helping customers save electricity. Also reported in Southern California Edison and Pacific Gas & Electric's application filing to the California Public Utilities Commission were their assumptions on participation. Southern California Edison assumes a 10 per cent penetration with 1 per cent growth per year for their online web pages while Pacific Gas & Electric assumes a 21 per cent penetration by 2030 for customer-purchased in-home displays.

BC Hydro qualitative focus group research, conducted with customers and employees, found there was strong interest in electricity feedback mechanisms. Based on focus groups completed in 2010, customers were optimistic that increased awareness via in-home feedback tools will help them conserve energy and save money. In general, most participants expressed interest in the program. In addition, it was found that 83 per cent of BC Hydro customers have at least one computer and 86 per cent had internet connectivity at home[10]. Given these statistics, the potential use of a secure online feedback website should be widespread.

Conservation Research Initiative

Important feedback was also derived from the Conservation Research Initiative, a program launched by BC Hydro in 2006. The goal of the Conservation Research Initiative was to examine how individual British Columbians could make a difference and help meet the growing demand for electricity in BC by conserving electricity in their homes.

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[6] The Effectiveness Of Feedback On Energy Consumption; Sarah Darby, Environmental Change Institute, Oxford University, April 2006; Residential Electricity Use Feedback: A Research Synthesis and Economic Framework; EPRI (Electric Power Research Institute), February 2009; Impact Of Informational Feedback On Energy Consumption—A Survey Of The Experimental Evidence; Ahmad Faruqui, Sanem Sergici and Ahmed Sharif, May 2009

[7] Application filed to CPUC December 12, 2007 App No 07-12-009

[8] Application filed to CPUC July 31, 2007 App No 07-07-026

[8] Pilot findings: http://usweatherizing.com/blog/?p=923

[10] Residential Customers Needs Survey F10 (February 2010)

This study was conducted in more than 1,800 residential homes across six communities: Vancouver, Burnaby, North Vancouver, West Vancouver, Campbell River and Fort St. John. The study tested time-of-use rates and smart meters to help BC Hydro better understand how adjusting the price of electricity at different times of the day influences electricity use by residential customers.

The results of the Conservation Research Initiative are summarized below:

- Overall consumption was reduced by 7.6 per cent.
- Energy use during peak hours was reduced by 11.5 per cent.
- 63 per cent of participants saved money by conserving and shifting their consumption to off-peak hours.

Theft Detection Pilots

Since 2005, BC Hydro has implemented four theft detection pilots using distribution system meters to conduct energy inventory balances with customer smart meters. All of these pilots have successfully demonstrated that the energy inventory balance approach, conducted at either the primary or secondary voltage level, can readily identify localized areas of the electricity system where theft is occurring. In total these pilots, which are still operational, covered over 800 homes, and resulted in the identification and termination of 22 electricity thefts. Where thefts have been identified and shut down quickly, there has been little recurrence. Further details regarding the theft pilots can not be released for security reasons. These theft detection pilots identified key requirements for the design of a scalable solution including the following three major components in addition to the basic smart metering system: distribution system meters; theft analytics software; and new investigation techniques and processes.

APPENDIX 4: QUANTIFIED BENEFITS AND KEY ASSUMPTIONS

This section provides a summary of the key sensitivities and assumptions for each benefit stream included in the Smart Metering Program business case.

Benefit Description	Present Value (PV) Millions (M)	Key Business Case Assumptions	Sensitivity Millions (M)
Meter Reading Automation Accenture Business Services for Utilities currently provides manual meter reading services. BC Hydro supplies the infrastructure including vehicles, facilities, meter reading software and hand-held equipment. This benefit represents a reduction in manual meter reading services, supporting infrastructure, and green house gas emission costs, based on an assumed Field Area Network coverage for 95 per cent of customers.	**$222 M** Range is: $182 M–$247 M	A Field Area Network will provide communications infrastructure to at least 95 per cent of customers. Costs to read the remaining 5 per cent of customers are estimated at 3 times higher than current costs.	Each per cent point over 95 per cent coverage adds $6 M to the PV.
Meter Sampling BC Hydro has ongoing processes to ensure customer meters are maintained and operated within the accuracy requirements mandated by Measurement Canada. Each year, a statistical sample of meter groups is removed and tested for accuracy. If a sample group does not meet the accuracy standards, that entire group of meters is removed from service. An average of 40,000 meters are replaced annually under this program. Smart meters will eliminate the need to sample and test meters for some period of time.	**$61 M** Range is: $56 M–$66 M	This benefit results from reduced operating costs for sampling processes and reduced capital expenditures to replace failed meter groups over a planned seven-year period following installation of smart meters. Health of meters in service will be monitored during the seven year suspension of sampling. Estimate of 1 per cent of meters replaced annually, based on increased accuracy of electronic smart meters.	Each per cent change in the meter failure rate results in a $3.4 M change in PV.
Remote Re-connect Automation Today, meter reconnections and disconnections are completed onsite by a meter technician or power line technician. The remote on/off switch provided within smart meters enables all connection related services to be completed remotely, safely and securely. This benefit is due to reducing the need for manual connects/disconnects for non-payment, and the associated vehicle expenses.	**$47 M** Range is: $42 M–$52 M	BC Hydro's policies and procedures for when service can and will be disconnected are not changed for this business case. Remote on/off switch will be included in all meters where it is technically feasible.	Each percentage point over 95 per cent coverage adds $0.23 M to the PV.

Distribution Asset Optimization Capital expenditures related to growth of the distribution system—driven by load growth, reliability improvements, customer connections and station expansion—are approximately $500 M per year for the foreseeable future. Smart Metering Program benefits from improved availability of assets and system performance data and information results in conservative capital budget savings of 0.3 to 0.5 per cent per year following implementation of all Smart Metering Program assets.	**$15 M** Range is: $12 M–$25 M	Does not include any distribution asset optimization benefits resulting from theft detection and reduction. Only includes incremental benefits due to new distribution system meters and smart meters.	Each 0.1 per cent change in the distribution system capital budget impact related to smart metering results in a $4.7 M PV change.
Outage Management Efficiencies Today, BC Hydro is only made aware of customer (residential/commercial) outages when they call 1 888 POWERON. Smart meters will provide automated outage notification, specific outage location information, and confirm when power has been restored. Smart Metering Program related benefits include improved time to restore outages, reduced visits to false outages, more rapid identification and restoration of embedded outages, and improved customer satisfaction.	**$10 M** Range is: $5 M–$15 M	Includes outage management improvements from both trouble-based outages (e.g. single customer calls) and storm-based outages (i.e. wide-spread outages due to a specific event).	Due to the high variability of outages from year to year, this benefit is based on an average, over the term of the business case.
Continuous Optimization and Load Research BC Hydro's Continuous Optimization Program targets operational savings in the commercial sector. The program provides consulting services to help identify actions to reduce energy use in buildings. With smart meters, the program will no longer have to retrofit the existing meter and install additional hardware on the customer's site to capture interval meter reading data. Smart meters will provide Load Research with load profile information in a more timely and accurate form, avoiding capital and operational costs.	**$6 M** Range is: $2 M–$10 M	Estimated savings in meter upgrades of $1,800 per Continuous Optimization site, plus savings of additional hardware and installation costs of $2,980 per site. Estimated annual operational savings for Load Research of $290 K, plus one-time capital savings of $2.2 M.	A 10 per cent change in the number of customers in the Continuous Optimization Program results in a change of $0.2M PV.

Call Centre and Billing With smart meters, customer calls related to estimated bills and meter reading access arrangements will be substantially reduced. Also, call centre agents will have much more information available to help address questions regarding meter reads, billing, payments, and energy conservation. BC Hydro expects call volumes to increase as smart meters are being introduced and this cost has been factored in to the overall business case.	**($2) M** Range is: $(4) M–$0 M	Call volumes estimated based on inquiries related to current Power Smart programs. Approximately 48 per cent of billing errors will be eliminated.	A change of 48,000 calls results in a change of $1 M in PV. Every 5 per cent change in billing exceptions changes the PV by $0.5 M
Voltage Optimization Voltage optimization or Volt-VAR Optimization (VVO) technology helps reduce the amount of electricity that must be transmitted in order to ensure sufficient power quality at customer sites. Smart meters will enhance BC Hydro's existing VVO program by providing significantly more measurement points along the distribution network, thus helping to manage voltage more effectively. Smart metering helps deliver VVO benefits for both the Distribution system and Customers: **Customers—**Extend the VVO program to a Power Smart Program for eligible commercial customers. **Distribution—**Enhance the effectiveness of the VVO program and enable the extension of the program to additional substations.	$108 M Range is: $48 M–$148 M $100 M Range is: $85 M–$150 M	At least 2,000 commercial customer sites have use characteristics that would benefit from voltage optimization. Benefit is net of the Demand Side Management Program costs to incent customers to install equipment.	Each increase/decrease of 10 per cent in GWh/yr in energy savings results in $14 M increase/decrease in PV. For each 100 increase/decrease in the number of customer sites included into the VVO program, the PV increases/decreases by $11 M.

Theft Detection The theft detection solution includes distribution system metering, business analytics, and an upgraded topology model to quickly and accurately identify where theft is occurring. This increased automation will shift BC Hydro from a reliance on public-generated tips to system-generated tips regarding suspected theft. Smart meters also have automated tamper alarms to alert BC Hydro. Benefits result from energy and capacity savings, additional revenue through prevention of theft, and back-billing to recover cost of stolen energy and investigation costs.	**$732 M** Range is: $632 M–$832 M	Estimated consuption by marijuana growing operations is 1,300 GWh/yr through F2033 (paid and theft), of which theft increases from 500 GWh/yr in F2007 to 850 GWh/yr in F2012. Realization of theft benefits is estimated at an initial 75 per cent, declining to about 67 per cent by F2027. Theft detection requires analysis and in-field investigation; the business case includes an incremental operations and maintenance increase of $10 M, declining to $7 M by F2015. Total portion of theft attributed to meter tampering is 5 per cent, with the rest attributed to diversion directly from distribution lines. An average of 16 per cent of back-billing for theft is collectible.	An increase/ decrease of 10 per cent in the amount of theft reduction achieved results in an increase/ decrease of $86 M PV.
Voluntary Time-of-Use Rates Reducing peak period demand for electricity can reduce the amount of capacity BC Hydro needs in the system, thus potentially deferring the need to build more generation, transmission, and distribution assets. The more detailed use information captured by smart meters enables BC Hydro to investigate different rate options including time-of-use. BC Hydro is in the early stages of rate design and will soon begin engaging with customers and stakeholders to receive feedback on different types of rates. No decisions have been made yet regarding specific rate designs and any final rate designs will be subject to approval by the BC Utilities Commission.	**$110 M** Range is: $30 M–$250 M	The business case benefits assume new time-of-use rates would be voluntary. Customer enrolment in time-of-use rate programs is expected to start slowly and build through 2015 to 30 per cent. Benefits are net of costs to design and implement the new rate structures. Price elasticity is assumed at -0.10.	A change in the participation rate of 1 per cent change results in a $5.2 M change in PV. The business case benefits translate to a 10 per cent shift from on-peak to off-peak usage by participating residential customers, on average.

Conservation Tools (in-home feedback) Offering customers opportunities to monitor their electricity consumption in new ways can lead to increased awareness of energy consumption and therefore increased conservation behaviour. Customers will be offered two feedback options: 1. Near real-time feedback delivered via an optional in-home display device; and/or 2. Hourly data, provided within 24 hours, through the Power Smart website.	**$220 M** Range is: $170 M–$270 M	BC Hydro will offer a rebate program to encourage customers to choose a basic, market available in-home display. Customer take-up of in-home display is assumed at 30 per cent. Energy savings from in-home displays are 4 per cent with eight year persistence. Website-based energy savings are 2 per cent, with 15 per cent penetration of residential customers.	An increase/ decrease of 1 per cent in customer participation translates to approximately $1.2 M in PV.

APPENDIX 5: ADDITIONAL NON-QUANTIFIED BENEFITS

In addition to the quantified benefits identified in the business case, the Smart Metering Program will deliver numerous other benefits that have not been captured in the business case to date. The following table provides a summary of these additional benefits.

Type of Benefit	Additional Benefits
Operational Efficiencies, Cost Savings and Other Benefits	Additional uses of metering (unrelated to theft detection) in distribution planning and operations, asset management, etc. Reduction of line losses unrelated to theft detection (e.g. street lights). Facilitation of screening process required to assess the impact of Distributed Generation and electric vehicles during planning. Increased data will significantly improve the precision and quality of load profiles. Reduce staffing needs, related facility space and office equipment. Reduction in carbon offset payment for emissions for the BC Hydro fleet vehicles used by Accenture Business Services for Utilities. Improved overall system efficiency through better ability to optimize supply and demand levels throughout the day.
Safety, Privacy and Security	Reduced employee and contractor exposure to potential accidents and injury due to reduction of time spent in the field. Improved public safety due to the reduction in electricity theft. Customer security and privacy will increase as meter readers will no longer be required to enter customer property to read, disconnect or reconnect meters.
Improved Customer Service and Convenience	Customer service representatives will have the ability to check current meter readings directly from the meter while the customer is on the phone to validate meter functionality, address billing complaints, and confirm whether an outage is on the customer side of the meter. Customers will no longer be required to unlock gates, keep dogs inside, provide keys for access, etc. On-demand meter reading when customers move in or out of premises will avoid adjusted billings between tenants, simplifying transactions for customers. Customers will have the option of signing up for automated outage notification. Customers can choose to receive rate related information through an in-home display. Customers who use the in-home feedback tools, whether it is a secure web page or in-home display, and conserve energy will benefit from lower bills. Better ongoing information for customers and quicker response to power outage situations will enable commercial customers to make better decisions and reduce down-time costs. Customers will benefit from faster service re-connection. Commercial customers will be better able to optimize commercial building systems, saving energy and money.

Environment	Facilitates conservation and energy efficiency. System efficiencies and increased automation within BC Hydro's operations will deliver some greenhouse gas emission reductions. Support for the large scale integration of electric vehicles and electrification of the transportation system could deliver further green house gas emission reductions. Smart metering benefits will help to achieve the Province's target to reduce the projected demand increase by at least 66 per cent through conservation. Supports BC Hydro's ability to pursue all cost-effective Demand Side Management.
Socio-economic	Employment opportunities related to the installation of meters, and creation of more information-based jobs. Opportunities for local business to build on the system and create new products and services that support a green economy. Opportunities to build on the new smart metering infrastructure to create made-in-B.C. technology solutions that support a green economy. Smart meters are the first step in enabling the large scale accommodation of electric vehicles, customer self generation and microgrids that will help communities throughout British Columbia become more self sufficient. Enables significant energy savings that can be used for other economic purposes.

APPENDIX 6: BUSINESS CASE ANALYSIS

A business case documents the economic justification to support an investment decision, such as acquiring assets. Business cases are based on forecasts of incremental cash flows, both benefits and costs, over a time horizon that reflects the economic lives of the assets acquired. These cash flows are then discounted resulting in a net present value (NPV).

A business case does not include non-cash financial impacts, such as depreciation, amortization, or write downs of existing assets. These are accounting transactions, included in appropriate financial reports, and are not a factor in the economic rationale to make a business investment.

The Smart Metering Program business case model includes all the inputs and assumptions required to complete a comprehensive financial analysis of costs and benefits over a 20 year term following the installation of the meters (through F2033). The Smart Metering Program business case analysis reflects those cash flows that are incremental to cash flows without the program. For example, the business case model captures total annual cash flows for capital expenditures, avoided and deferred capital benefits, operating expenses and operating benefits. The NPV of the cash flows over the evaluation period is then calculated. A positive NPV supports the proposed investment decision.

The table below provides a summary of the key financial modeling assumptions used in the Smart Metering Program business case model:

KEY FINANCIAL MODELLING ASSUMPTIONS

Category	Assumption	Sensitivity
Discount Rate and Inflation Rate	The present value of all costs and benefits has been calculated using the nominal (i.e., with inflation) BC Hydro discount rate of 8 per cent[11] per year.	A variation of 0.25 per cent (+/-) in the discount rate changes the NPV in the business case by approximately $30 M.
Value of Energy	Value of energy is the BC Hydro reference energy price based on the 2009 Clean Call for Power. This price is $124 per MWh for F2010 and adjusted for inflation annually.	A 10 per cent change in the assumed value of energy results in a change in the NPV of about $85 M.
Value of Capacity	Value of capacity is an estimate for the avoided cost of building generation, transmission and distribution assets. The capacity reference price is updated as part of the integrated resource planning process. For capacity benefits associated with energy savings in this business case, the value of capacity is $88 per kilowatt-year (as set in F2009 and adjusted for inflation annually).	A 10 per cent change in the assumed value of the capacity results in a change in the NPV of about $28 M.

[11] BC Hydro's discount rate (Weighted Average Cost of Capital) for business cases is based on BC Hydro's deemed capital structure, the allowed rate of return on equity—both of which are approved by the British Columbia Utilities Commission—and the forecasted average cost of debt. The Weighted Average Cost of Capital for F2011 is presently set at 8 per cent, and includes a 2 per cent rate of inflation.

Amortization period	Amortization periods for smart metering assets acquired are based on the estimated economic life of each asset type, as follows: • Smart Meters: 20 years • Telecommunications (Field Area Network): 20 years • Telecommunications (Wide Area Network): 35 years • Distribution System Meters: 15 years • IT Hardware: 5 years • IT Software: 10 years	These amortization periods have no impact on the NPV of the business case. Assumed amortization periods do, however, affect customer rate impacts attributable to the Smart Metering Program.
Asset Refresh	Assets are typically replaced based on the estimated economic life of each asset type. Where the economic life of an asset falls within the timeframe of this business case, the asset refresh cost has been factored into the financial analysis.	No sensitivity analysis required.

Business Case Summary

The following table provides a summary of the overall business case, including the key financial components resulting in the positive net present value (NPV) of $520 million. For greater clarity—and because benefits have typically been discussed in terms of present value and costs in terms of nominal value—both nominal and present value figures are provided.

The ongoing operating and maintenance expenses for the Smart Metering Program include any incremental costs required to operate and maintain the new assets—such as meter maintenance, software application support, and telecommunications operations and maintenance.

The capital cost to replace Smart Metering Program assets during the period to F2033, based on the economic life of each asset type, has been included in the overall NPV. This capital cost is adjusted for the un-depreciated net book value of assets remaining in service at the end of F2033.

The following table provides a net present value (NPV) scenario analysis, beginning with the base case of $520 million. The NPV remains positive even if all the benefits are achieved at the low end of the estimated benefit range. Conversely, if all benefits are achieved at the high end of the range, the NPV increases to $956 million.

BUSINESS CASE SUMMARY IN NOMINAL AND PRESENT VALUE

Business Case Summary	Nominal Value ($M)	Present Value ($M)
Gross Benefits attributable to Smart Metering Program, less costs related to the achievement of individual benefits	$4,658	$1,629
Less: Ongoing operating and maintenance expenses and incremental asset replacement capital	(745)	(330)
Less: Smart Metering Program Costs	(930)	(779)
Total Net Value for the period F2006 to F2033	**$2,983**	**$520**

Development of the Business Case

The Smart Metering Program business case has been updated and revised several times since the program was first initiated in 2006. Throughout the business case development process, BC Hydro has engaged a number of third party experts, including PricewaterhouseCoopers (PwC) and Enspiria Solutions, to review and validate costs, benefits, approach and methodology. As a result of the continued evolution of the smart metering industry and related technologies, BC Hydro undertook a full refresh of the business case in 2010.

APPENDIX 7: RATE ANALYSIS

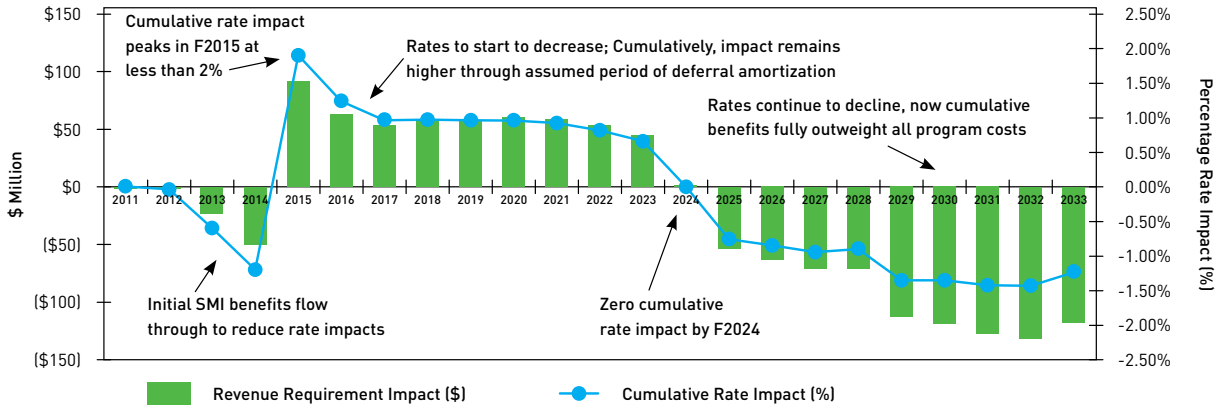
The Smart Metering Program pays for itself through reduced theft of electricity, energy savings, and operational efficiencies. Net benefits will flow to customers, reducing rates below what they would otherwise be in the absence of BC Hydro's investment in the program.

Similar to other capital projects, the Smart Metering Program has initial rate impacts which are reduced over time as the benefits accumulate. In order to better match the initial cost recovery to the timing of benefits realization, BC Hydro will seek BC Utilities Commission approval to "smooth" rate impacts.

The *Clean Energy Act* exempts the program from those sections of the *Utilities Commission Act* that specify BC Hydro's obligations to seek approvals from the BC Utilities Commission for capital projects. However, when BC Hydro seeks to recover Smart Metering Program expenditures in rates, the BC Utilities Commission will review the prudency of BC Hydro's decisions and actions in relation to the implementation of this program.

The estimated impact of the Smart Metering Program on BC Hydro's rates is based on the net cash flow benefits as presented in the business case, which are then incorporated into BC Hydro's regulatory accounting model to determine the incremental impact on BC Hydro's annual revenue requirements[12].

The graph below illustrates the projected rate impact of the Smart Metering Program over the term of the business case, before considering potential rate smoothing proposals. Specifically, the graph shows the annual impact of the program on BC Hydro's revenue requirements, as well as the cumulative rate impact which ultimately results in a sustained rate decrease of over 1.25 per cent (below what rates would otherwise be in the absence of the Smart Metering Program).



The green bars on the graph show the annual dollar impact (in millions) of the Smart Metering Program on BC Hydro's overall revenue requirement. The blue line on the graph illustrates the cumulative impact on rates over the term of the business case. To help manage current rate pressures, $75 million in benefits from the program will flow through to customers in F2012 through F2014—resulting in a cumulative rate decrease of just over 1 per cent by F2014.

Without the planned smoothing, in the first year following full implementation of the Smart Metering Program (F2015), there is an increase in BC Hydro's revenue requirement as the recovery of current—and previously deferred—costs starts. From F2016 through F2023, the additional revenue requirement due to the Smart Metering Program starts to drop.

[12] Revenue requirement refers to the total amount of money BC Hydro must collect from customers to pay all operating costs, energy costs, amortization, financing charges, and return on equity in a given year.

From F2024 on, the Smart Metering Program benefits reduce BC Hydro's annual revenue requirement, resulting in rates being reduced below what they would otherwise be without the program. Over the term of the business case, there is a total reduction in BC Hydro's revenue requirement of over $400 million.

This $400 million total reduction in BC Hydro's revenue requirement differs from the business case net present value of $520 million because the revenue requirement includes accounting impacts of non-cash transactions from a regulatory point of view. For example, the revenue requirement factors in the financial impacts due to timing of regulatory cost recovery and recovery of the un-depreciated sunk cost of existing meters—a non-cash item.

APPENDIX 8: KEY BUSINESS RISKS

SUMMARY OF KEY RISKS AND MITIGATION STRATEGIES

Risk	Description	Mitigation Strategies
Meter Supply Chain	Risk of the market's inability to meet meter supply chain requirements, and interdependencies with other vendors.	Procurement evaluation criteria considered the vendor's ability to meet the timeline. Incentive mechanisms are in place to align the related suppliers to deliver on time and on budget. Significant liquidated damages to be included in final contracts to ensure vendors meet their commitments.
Emerging Technology	Risk of technology continuing to evolve resulting in stranded assets.	All meter vendors under consideration in the procurement process have met minimum mandatory criteria which included having sizable deployments in other North American and European utilities, and based on proven technologies. Technology selection criteria were designed to meet current and expected future business needs. Procurement evaluation criteria included technology "future proofing" to ensure future business, technical and operational requirements were considered. Where technology risks may still exist, the successful vendor will be contractually committed to meeting BC Hydro's requirements by an agreed date. In addition, they will be required to provide full backward compatibility for selected products.
BC Hydro Resource Constraints	Significant resource constraints internally for telecommunications, field crews, and technology personnel—skills and head count—could impact the schedule.	The Smart Metering Program is a top corporate priority with broad executive oversight and commitment. Leverage meter and field contract labour market for peak resource requirements—including incentives for vendors to grow and create jobs in British Columbia.
Meter Deployment	Unable to complete meter deployment by the end of 2012.	Contract incentives are in place for solution integrator, meter system and meter deployment vendors to meet 2012 timeline. Use various strategies to deploy meters in multiple regions concurrently, including distributed warehouses.

Budget	Risk of exceeding project budget due to unforeseen costs or changes in scope.	Procurement approach designed to achieve cost certainty for at least 50 per cent of the project budget, including mechanisms like: • affordability ceilings • fixed price contracts • incentive mechanism shared with all vendors Rigorous control over scope elements implemented including: • formal change control process for any change in scope, timeline, or deliverables • project controls office in place to manage issues, risks, assumptions and changes Rigorous financial controls are being implemented including: • budget assigned to accountable managers and measured • financial performance tracking and forecasting tools
Safety/Security/ Customer Privacy	Risk of security or privacy breach impacting customers or system operations.	Safety, security and privacy were built into all procurement processes. Safety, security and privacy were built into end-to-end solution architecture and all business processes, which will be validated during solution acceptance testing. BC Hydro is an active participant in external standards setting groups, including committees focused on safety, security, and privacy. A dedicated smart metering safety, security and privacy office has been established. Formal penetration test plan including hiring external agencies to attempt to break into the system.
Customer Experience	Risk of limited customer awareness and public support of smart metering, and/or negative customer experience during meter deployment.	Customer research to discover baseline level of public awareness and to identify specific issues and concerns regarding meter deployment. Comprehensive Smart Metering Program communications plan developed and being implemented. Includes specific customer contact plans pre-, during, and post- meter deployment. Incorporating lessons learned from other utilities with respect to customer engagement.

APPENDIX 9: MANAGING RISK THROUGH PROCUREMENT

In 2008, BC Hydro initiated a procurement process for a single Solution Integration firm, which would in turn be responsible for selection and sub-contracting of the required technology components, meters, deployment services, and project implementation. Proposals submitted at that time were significantly over budget and did not achieve the risk transfer expected by BC Hydro.

In March 2010, BC Hydro decided to proceed with a "disaggregated" procurement approach to contract directly with proven industry vendors—ensuring BC Hydro retains direct control over the program while building business relationships that would extend over the economic life of the assets. Partnerships BC was engaged to provide expertise in structuring a comprehensive and open procurement process.

Specific project risk mitigation managed through procurement includes:

- **Minimum mandatory criteria:** a number of mandatory 'pass/fail' criteria were established to ensure only established, proven and scalable proponents are considered.
- **Affordability ceilings:** establishing the maximum value BC Hydro is prepared to pay for a product or service providing cost certainty.
- **Subject matter experts:** both internal and external subject matter experts have been involved to ensure a full understanding of proposed technologies.
- **Panel interviews:** because experienced professional resources are critical to the success of the project, panel interviews are conducted with key individuals proposed by vendors.
- **Fairness Advisor:** an independent and experienced Fairness Advisor participated in all procurement processes.
- **Due Diligence Committee:** a senior level independent advisory committee reviews procurement recommendations of the selection teams to ensure that the process was followed and the basis of recommendations is appropriately documented.

As of December 31, 2010, BC Hydro continues in active procurement or final contracting in four key procurement streams—Solutions Integrator, Metering System, Meter Data Management System and Meter Deployment Services. Announcements related to the successful proponents are expected in the near future.

APPENDIX 10: TECHNOLOGY AND INDUSTRY STANDARDS GROUPS

BC Hydro has been active with industry in North America for several years to understand and influence the technology and standards that will impact the success of the Smart Metering Program. This work has included participation on a number of committees and collaboration with various industry associations as outlined below:

Industry Association	Purpose	BC Hydro Participation and Value
Electric Power Research Institute (EPRI)	To advance innovation, research and utility solutions.	Active participation on power delivery programs including smart grid applications.
National Institute of Standards and Technology (NIST)	To advance industry standards. Currently working on priority action plans related to smart grid development.	BC Hydro is closely following the NIST guidelines and standards for security including NISTIR 7628 and Federal Information Processing Standards.
GridWise Alliance	To advance smart grid business and technology solutions, including policy and legislation.	Membership has provided direct access to the latest industry advancements.
National Electric Energy Testing Research and Applications Center (NEETRAC)	To test and validate industry solutions, particularly safety for metering services.	Involved in defining and testing the latest smart metering functionalities and applications.
Open Smart Grid (OpenSG)	Address delivery of utility smart grid and smart metering requirements and related key industry technology issues.	BC Hydro is actively involved in OpenSG efforts including smart grid security and applying best practices for protecting the smart metering network and smart grid.
Canadian Standards Association (CSA)	To certify the safety of electrical equipment.	Assist in the evaluation of new smart grid components to meet safety standards.
Canadian Electrical Association (CEA)	To represent the Canadian utility industry. Currently addressing metering standards and acceptance with Measurement Canada.	Committee work to support acceptance of future metering solutions.
Utilities Telecom Council (UTC)	To advance telecom solutions and set standards.	Participation to establish efficient smart grid communication solutions.
Canadian National Committee on Smart Grid Technology and Standards	To address appropriate standardization for smart grid in Canada.	Participation to guide Canadian standards in a global context.
Institute of Electrical and Electronics Engineers (IEEE)	To address international technology issues and set standards.	Participation on a variety of technical committees related directly to BC Hydro's program.
ZigBee Alliance	To develop open industry standards for low-power wireless communications.	Active participation in the "Smart Energy Profile" working group, which defines data communication standards for smart meters and in-home devices over a Home Area Network.
Health Canada	Responsible for helping Canadians maintain and improve their health, while respecting individual choices and circumstances.	Ensuring compliance with the protection of customers and workers related to electricity including electromagnetic fields (EMF).
SAP Lighthouse Council	To foster collaboration between SAP, major utilities and industry vendors to integrate Advanced Metering Infrastructure with utility Enterprise technology.	Exposure to leading practices that achieve integration of end-to-end processes between the meter and the backend systems, and to reduce a company's total cost of ownership for Advanced Metering Infrastructure.

GLOSSARY

Authorized Amount

Requested funding for a project inclusive of all contingencies and based on a fixed scope and in-service date.

British Columbia Utilities Commission (BC Utilities Commission)

An independent regulatory agency of the provincial government operating under and administering the *Utilities Commission Act*. The BC Utilities Commission's responsibility is the regulation of the energy utilities under its jurisdiction to ensure that the rates charged to utility customers for energy are fair, just and reasonable. The BC Utilities Commission is responsible for ensuring customers receive safe, reliable and non-discriminatory rates and shareholders receive a fair return.

Capacity

The maximum sustainable amount of energy that can be produced or carried at an instant. For example, a car engine's horsepower rating is its energy capacity.

Capital Refresh of Assets

The program assets are assumed to be replaced periodically based on the estimated economic life of each asset type.

Clean Energy Act

A long-term vision for BC to become a clean energy leader. This Act guides government, BC Hydro and the British Columbia Utilities Commission in advancing the province's ambitious sustainable energy vision.

Contingency

An amount provided in the estimate for a project having a fixed scope and in-service date to allow for potential costs which cannot be specifically identified at the time of estimate preparation but which experience shows will likely occur.

Customer Generation

Allows customers to generate power on a smaller-scale in order to provide an alternative to, or an enhancement of, the traditional electrical power system. It can take the form of solar panels, wind power, biomass, etc.

Definition Phase

Detailed investigation of the approved approach and preparation of a preliminary design, procurement, and Project Plan for Implementation Phase funding complete with business case. This phase also includes the securing of all key defining agreements.

Demand Side Management (DSM)

Actions that modify customer demand for electricity, helping to defer the need for new energy and capacity supply additions.

Direct Labour Cost

Labour cost without benefits or overhead loadings.

Distribution System

The portion of the power system that converts energy to the right voltage and delivers power to homes and businesses across the province.

Electrical Distribution System Optimization (EDSO)

Helps to reduce electricity usage and costs with no capital investment through matching voltage to equipment requirements.

Energy

How much is consumed (or produced) over a period of time.

Field Area Network

A secure two-way telecommunication network between customer meters, other end point devices, aggregation devices and network extenders.

Greenhouse Gas (GHG)

Gases that are thought to contribute to global climate change, or the "greenhouse effect," including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).

Grid Modernization

An automated, intelligent power delivery system that supports additional services and benefits to customers, the environment and the economy.

Gross Benefits

The value of benefits before the deduction of related costs.

Home Area Network (HAN)

A data communications system contained within a premise, such as a residence, that can connect devices (e.g. in-home display device) in the premise to the smart meter.

Identification Phase

Review of conceptual alternatives, evaluation of feasibility, review of alternatives, and delivery of a project plan for Definition Phase funding. This phase ends with a decision on whether or not to proceed to the next phase.

In-home Display

A device that can communicate with a smart meter to show how much energy is being consumed and at what cost.

In-home Feedback Tools

Different ways through which customers can receive feedback about the electricity they are consuming, and the cost of that electricity, in their home, business or other location. In-home feedback can include an in-home display and/or secure websites, home energy management systems etc. that provide information about energy consumption.

Implementation Phase

Includes detailed design, material and equipment procurement, construction, testing and commissioning into service. The phase ends with a Post-Expenditure Review and a Project Completion Report.

Initiation Phase

Establishment of an initial project team, research and benchmarking. This phase ends with a decision to proceed on whether or not to proceed to the next phase.

Interest During Construction (IDC)

When an asset is constructed, there is often a considerable period between the start of a project and its completion. Because the cost of an asset should include all costs incurred to prepare it for use, interest costs related to the construction are generally included in the cost of the asset that is capitalized.

Interval Data Recording (IDR)

A record of energy consumptions, with reading made at regular interval throughout the day, every day.

Measurement Canada

A federal agency responsible for ensuring the integrity and accuracy of measurement in the Canadian marketplace, including the accuracy of electricity meters.

Meter Data Management System

The software applications and infrastructure required to support the integration of data from the smart metering system into other BC Hydro systems. The data is made available to the utility for a variety of business functions such as billing, energy diversion detection and outage tracking.

Microgrids

Small networks of generating sources capable of operating independently from the electricity system. Microgrids can switch quickly between operating on and off the system, allowing communities to become more self-sufficient.

Net Benefits

The value of the benefits after the reduction of related costs.

Net Present Value (NPV)

The difference between the present value of benefits and the present value of costs (including capital, operating, maintenance and administration costs) for a given discount rate.

Nominal Growth/Price

Growth or price measured in current dollars at the time the goods are produced; change includes the amount of inflation.

Ongoing Operating Expenses

The incremental operating costs required to operate and maintain program assets, such as meter maintenance and telecommunications and software application operating costs.

Present Value

Today's discounted value of future receipts or expenditures.

Price Elasticity

The price responsiveness of consumption, expressed as the percentage change in quantity per a 1 per cent change in price. For example, an elasticity of -0.10 means that a 1 per cent increase in real price would lead to a 0.1 per cent decrease in consumption.

Project Costs

The authorized amount for the Smart Metering Program is $930 million (nominal), and this reflects the costs to put the program's assets required by regulation into operation.

Project Plan

A document that sets out a strategy and course of action for meeting the project objectives.

Revenue Requirement

A revenue requirement is the forecast cost of doing business for a period of time and must be approved by the British Columbia Utilities Commission. BC Hydro can collect its required revenue through tariffs—the rate charged to customers.

Regulatory Account

Deferred amounts related to the Smart Metering Program will be recorded in the Smart Metering Program Regulatory Account. BC Hydro's accounting policies allow for the deferral of amounts that under Canadian generally accepted accounting principles would otherwise be recorded as expenses or income in the current accounting period. The deferred amounts are either recovered or refunded through future rate adjustments.

Smart Grid

A smart grid delivers electricity from suppliers to consumers using digital communications to save energy, reduce costs and increase reliability and transparency. A smart grid is made possible by applying sensing, measurement and control devices with two-way communications, making it possible to dynamically respond to changes in system condition. A smart grid includes an intelligent monitoring system that keeps track of all electricity flowing in the system. It also has the capability of integrating clean, renewable electricity such as solar and wind.

Smart Meter

Smart meters provide two-way communication between the customer's meter and BC Hydro, capturing the amount of power that is consumed and when.

Smart Metering and Infrastructure Program

The Smart Metering and Infrastructure Program or Smart Metering Program plays a key role in modernizing BC Hydro's electricity system. It involves the introduction of new digital smart meters and the supporting infrastructure.

Supervisory Control and Data Acquisition (SCADA)

Computer systems used to send and collect supervisory controls and monitor data through power lines.

Volt-VAR Optimization (VVO)

Optimizes the energy delivery efficiency on distribution systems using real-time information, minimizing power loss.

Smart meters will allow BC Hydro to continue to manage the electricity system in a reliable, safe, and cost-effective manner.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.2 Please confirm that the Smart Metering Program and Smart Grid together will include financial benefits related to:

- Meter Reading Automation,
- Meter sampling,
- Remote Re-connect automation,
- Distribution Asset Optimization,
- Outage Management Efficiencies,
- Continuous Optimization and Load Research,
- Voltage Optimization (Commercial customer sites and Distribution system)
- Theft detection,
- Voluntary time of use rates, and
- Conservation tools.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.3 Please identify any additional financial benefits that BC Hydro expects to achieve as a result of smart meter deployment.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.4 Please quantify the anticipated financial benefits that are expected to accrue from each of the areas listed above, and any that BC Hydro has added.

RESPONSE:

Please refer to page 9 of the SMI Program business case attached to the response to CEC IR 1.7.1.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.5 Please identify any unquantified financial benefits that BC Hydro attributes to the SMI program.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.6 Please explain if the anticipated financial benefits were assessed on the basis of full deployment of smart meters.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.6.1 If they were not, please provide the estimated deployment that BC Hydro used to develop its financial benefits predictions.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.7 Please explain if, and how, the financial benefits of each of these components will be impacted by a lower than full deployment of smart meters, and the continued use of legacy meters.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.7.1 If there are no financial impacts identified from a lower than full deployment of smart meters, is it BC Hydro's position that they are, or will be able to completely achieve the benefits of the smart meters by undertaking other measures to compensate?

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.7.1.1 If no, please identify which benefits will be lost a result of a lower than full deployment of smart meters, and the continued use of legacy meters.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.7.2 If the financial benefits will be impacted, please provide a sensitivity analysis of all the financial benefits that will be lost based on the proportion of the 75,000 legacy meters that continue to remain in place and may, or may not be changed out depending upon customer choice.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.8 Please identify which, if any, financial benefits will be not be achieved by the deployment of radio-off meters instead of the radio on smart meters.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.8.1 If the financial benefits will be impacted, please provide a quantification of the expected loss.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.8.1.1 Please provide a sensitivity analysis of the financial benefits that will be lost based on the proportion of the 75,000 Legacy Meters that continue to remain in place.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.9 Please identify the full suite of non-financial benefits that are attributable to the SMI program.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

7.0 Exhibit B-1, page 1-5

> The Smart Grid Component of the SMI Program includes installation of theft detection and grid modernization infrastructure upgrades. New distribution system meters and advanced software systems, together with the smart meters, will enable BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion. These improvements will also facilitate the efficient operation of the electric system, and enable integration, on a large scale, of distributed generation into the distribution system and the provision of electricity service that allows for the large-scale use of electric cars.

1.7.10 Please identify those non-financial benefits that will be compromised by a less than full deployment of smart meters and explain why they might be compromised.

RESPONSE:

For the reason provided in the response to CEC IR 1.9.7, BC Hydro declines to respond since BC Hydro believes that the requested information is not relevant to the scope of this proceeding.

8.0 Exhibit B-1, page 1-4 and Exhibit A, page 3 of 6

The Smart Metering System component of the SMI Program includes installation of a new revenue meter for "eligible premises", as that term is defined in the SMSG Regulation, as well as related telecommunications infrastructure and computer hardware and software systems to download and process the electricity consumption data measured by the meters. These new meters must be capable of doing all of the things listed in section 2 of the SMSG Regulation. For example, the new meters must be capable of transmitting and receiving information in digital form. Accordingly, BC Hydro has been installing and putting into operation at eligible

(a) measuring electricity supplied to an eligible premises;

(b) transmitting and receiving information in digital form;

(c) allowing the authority remotely to disconnect and reconnect the supply of electricity to an eligible premises, unless

(i) the point of metering for the eligible premises

(A) is greater than 240 volts,

(B) is greater than 200 amperes, or

(C) is three phase, or

(ii) the eligible premises

(A) has a bottom-connected meter,

(B) has an output or input pulse meter, or

(C) has a meter that measures maximum electricity demand in watts;

(d) recording measurements of electricity, and recording the date and time of the recording, at least as frequently as in 60-minute intervals;

(e) being configured by the authority at a location either remote from or close to the meter;

(f) measuring and recording measurements of electricity generated at the premises and supplied to the electric distribution system;

(g) transmitting information to and receiving information from an in-home feedback device, unless the point of metering for the eligible premises meets any of the criteria set out in paragraph (c) (i) or the eligible premises meets

1.8.1 Please confirm that legacy meters cannot do any of the functions listed in Section 2 of the SMSG Regulation, except measure electricity supplied to an eligible premise.

RESPONSE:

Some of the legacy meters used by BC Hydro are digital and some of them have the capability to perform some of the functions specified in paragraphs 2(b), (e) and/or (f) of the Smart Meters and Smart Grid Regulation. However, no legacy meter can perform all of the functions specified in section 2 of the Smart Meters and Smart Grid Regulation.

8.0 Exhibit B-1, page 1-4 and Exhibit A, page 3 of 6

The Smart Metering System component of the SMI Program includes installation of a new revenue meter for "eligible premises", as that term is defined in the SMSG Regulation, as well as related telecommunications infrastructure and computer hardware and software systems to download and process the electricity consumption data measured by the meters. These new meters must be capable of doing all of the things listed in section 2 of the SMSG Regulation. For example, the new meters must be capable of transmitting and receiving information in digital form. Accordingly, BC Hydro has been installing and putting into operation at eligible

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(c) allowing the authority remotely to disconnect and reconnect the supply of electricity to an eligible premises, unless

(i) the point of metering for the eligible premises

(A) is greater than 240 volts,

(B) is greater than 200 amperes, or

(C) is three phase, or

(ii) the eligible premises

(A) has a bottom-connected meter,

(B) has an output or input pulse meter, or

(C) has a meter that measures maximum electricity demand in watts;

(d) recording measurements of electricity, and recording the date and time of the recording, at least as frequently as in 60-minute intervals;

(e) being configured by the authority at a location either remote from or close to the meter;

(f) measuring and recording measurements of electricity generated at the premises and supplied to the electric distribution system;

(g) transmitting information to and receiving information from an in-home feedback device, unless the point of metering for the eligible premises meets any of the criteria set out in paragraph (c) (i) or the eligible premises meets

1.8.1.1 If not confirmed, please list and provide an explanation as to which aspects of the SMSG regulations the legacy meters meet.

RESPONSE:

Please refer to the response to CEC IR 1.8.1.

8.0 Exhibit B-1, page 1-4 and Exhibit A, page 3 of 6

The Smart Metering System component of the SMI Program includes installation of a new revenue meter for "eligible premises", as that term is defined in the SMSG Regulation, as well as related telecommunications infrastructure and computer hardware and software systems to download and process the electricity consumption data measured by the meters. These new meters must be capable of doing all of the things listed in section 2 of the SMSG Regulation. For example, the new meters must be capable of transmitting and receiving information in digital form. Accordingly, BC Hydro has been installing and putting into operation at eligible

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(C) is three phase, or

(ii) the eligible premises

(A) has a bottom-connected meter,

(B) has an output or input pulse meter, or

(C) has a meter that measures maximum electricity demand in watts;

(d) recording measurements of electricity, and recording the date and time of the recording, at least as frequently as in 60-minute intervals;

(e) being configured by the authority at a location either remote from or close to the meter;

(f) measuring and recording measurements of electricity generated at the premises and supplied to the electric distribution system;

(g) transmitting information to and receiving information from an in-home feedback device, unless the point of metering for the eligible premises meets any of the criteria set out in paragraph (c) (i) or the eligible premises meets

1.8.2 Please confirm that Radio Off smart meters meet the requirements of the SMSG regulation.

RESPONSE:

The radio-off meters BC Hydro will use fall within the definition of "radio-off meter" in Direction No. 4.

8.0 Exhibit B-1, page 1-4 and Exhibit A, page 3 of 6

The Smart Metering System component of the SMI Program includes installation of a new revenue meter for "eligible premises", as that term is defined in the SMSG Regulation, as well as related telecommunications infrastructure and computer hardware and software systems to download and process the electricity consumption data measured by the meters. These new meters must be capable of doing all of the things listed in section 2 of the SMSG Regulation. For example, the new meters must be capable of transmitting and receiving information in digital form. Accordingly, BC Hydro has been installing and putting into operation at eligible

(a) measuring electricity supplied to an eligible premises;

(b) transmitting and receiving information in digital form;

(c) allowing the authority remotely to disconnect and reconnect the supply of electricity to an eligible premises, unless

(i) the point of metering for the eligible premises

(A) is greater than 240 volts,

(B) is greater than 200 amperes, or

(C) is three phase, or

(ii) the eligible premises

(A) has a bottom-connected meter,

(B) has an output or input pulse meter, or

(C) has a meter that measures maximum electricity demand in watts;

(d) recording measurements of electricity, and recording the date and time of the recording, at least as frequently as in 60-minute intervals;

(e) being configured by the authority at a location either remote from or close to the meter;

(f) measuring and recording measurements of electricity generated at the premises and supplied to the electric distribution system;

(g) transmitting information to and receiving information from an in-home feedback device, unless the point of metering for the eligible premises meets any of the criteria set out in paragraph (c) (i) or the eligible premises meets

1.8.2.1 If not confirmed, please list and provide an explanation as to which aspects of the SMSG regulation the Radio Off smart meters do not meet.

RESPONSE:

Please refer to the response to CEC IR 1.8.2.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.1 Please provide BC Hydro's definition of 'program costs'.

RESPONSE:

'Program costs' are defined as per Direction No. 4:

"program costs" means costs related to the installation and operation of, and services related to, legacy meters or radio-off meters at applicable premises, including, without limiting this, costs related to

(a) computer hardware and software systems respecting the use and operation of legacy meters or radio-off meters,

(b) the conversion of radio-off meters into smart meters for future customers,

(c) attendance at an applicable premises to install a legacy meter or radio-off meter;

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.2 Please provide BC Hydro's definition of 'investigation costs'

RESPONSE:

'Investigation costs' are defined as per Direction No. 4:

> **"investigation costs" means costs related to investigating and identifying the location of unmetered loads referred to in section 4 (1) (a) (iv) of the Smart Meters and Smart Grid Regulation, B.C. Reg. 368/2010, in areas where the installation of one or more legacy meters reduces or would reduce the accuracy of electricity balance analyses performed to estimate the extent and location of those loads;**

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.3 Please provide BC Hydro's definition of 'infrastructure costs'

RESPONSE:

'Infrastructure costs' are defined as per Direction No. 4:

> **"infrastructure costs" means costs related to the installation and operation of communications infrastructure in areas where the installation of one or more legacy meters or radio-off meters hinders or would hinder the transmission of information among smart meters;**

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.4 Would BC Hydro agree that while the 'program costs, investigation costs and infrastructure cost are defined as being recoverable in the Direction, neither BC Hydro nor the Commission is limited to recovering these types of costs and that other types of costs might be included for recovery.

RESPONSE:

No. The charges to be established in accordance with section 3(1)(a)(i) of Direction No. 4 are to recover program costs, investigation costs and infrastructure costs from applicable customers at applicable premises where a legacy meter or radio-off meter is installed, to the extent that the authority requests recovery of any of those costs from those customers. The proposal outlined in the question would not be consistent with Direction No. 4.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.4.1 Please explain why or why not.

RESPONSE:

Please refer to the response in CEC IR 1.9.4.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.5 Please identify any other costs directly related to the meter choice program of which BC Hydro is aware and will not recover.

RESPONSE:

The charges to be applied to eligible customers where a legacy or radio-off meter remains installed at the customer's premises, as proposed in the Application, are designed to recover forecast "program costs", "investigation costs" and "infrastructure costs" as those terms are defined in Direction No. 4. However, the charges are not designed to recover the costs of communicating with and notifying customers of their eligibility and their options for the Meter Choices Program and the costs of this regulatory proceeding.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.6 Would BC Hydro agree that neither BC Hydro nor the Commission is limited to recovering costs, and that it would not be unacceptable for additional charges to be approved that exceed the total costs for the meter choices program.

RESPONSE:

No.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.7 Would BC Hydro consider any limitations to efficiencies and/or expected financial benefits as a result of an incomplete deployment of radio-on smart meters to be included in the 'program cost, investigation or infrastructure ' costs to be recovered from those customers with legacy meters and/or radio off meters.

RESPONSE:

No, Direction No. 4 specifies certain costs that shall be recovered in the specified rates, and does not include any loss of benefits. However, certain costs BC Hydro will incur to mitigate the impacts of legacy meters remaining on the system and the use of radio-off meters are "investigation costs" and "infrastructure costs" as those terms are defined in Direction No. 4.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.7.1 Please confirm that BC Hydro is, in this application, requesting BCUC approval of rates that will recover all of the costs or loss of benefits that BC Hydro anticipates will arise from a less than 100% deployment of radio-on smart meters.

RESPONSE:

Not confirmed. Please refer to the responses to CEC IRs 1.9.5 and 1.9.7.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.7.1.1 If BC Hydro is not seeking to recover all costs or loss of benefits it anticipates, please explain why not and if it would expect to do so in the future.

RESPONSE:

The proposal outlined in the question would not be consistent with Direction No. 4.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.7.2 Please confirm that BC Hydro will seek to recover all the costs in the event that there are additional unforeseen costs or loss of benefits as a result of the less than 100% deployment.

RESPONSE:

BC Hydro does not fully understand the question. Rates are set to recover forecast costs based on forecast usage, as approved by the BCUC. Please also refer to the response to BCUC IR 1.6.5.3.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.7.2.1 If not confirmed, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.9.7.2.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.8 Does BC Hydro consider the regulatory costs related to the provision of the Choice program to be an applicable cost for recovery from those customers who choose a legacy meter or radio off meter?

RESPONSE:

The new charges applied for in the Application are not designed to recover the costs of this regulatory proceeding. Please refer to the response to CEC IR 1.9.5.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.8.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.9.5.

9.0 Exhibit B-1, page 1-5

> (a) "program costs", "investigation costs" and "infrastructure costs" as the terms are defined in the Direction, from customers at premises where a legacy meter or radio-off meter is installed, to the extent that BC Hydro requests BCUC approval of rates that recover any of those costs from these customers

1.9.9 Please identify all the types of regulatory activities that BC Hydro expects to undertake as a result of providing the customer Choice program.

RESPONSE:

Regulatory activities as a result of the Meter Choices Program are expected to be:

1. **Overseeing the application process, which includes, for example:**
    1. **Input and review of the Application**
    2. **Management of the IR process**
    3. **Review of final and reply submissions**
    4. **Submission of compliance filings as a result of a BCUC direction**
    5. **Submission to the BCUC with regards to Participant Assistance/Cost Award requests**
2. **Review of the BC Hydro Standard Charges as part of a future Rate Design Application.**

10.0 Exhibit B-1, page 1-7, (with footnote) and Appendix B page 3 of 7

17 To comply with the Direction, the BCUC is required to issue an order pursuant to
18 section 3(3) by October 25, 2013.[7]

7 Pursuant to section 4 of the Regulations Act, Direction No. 4 became effective on the date the Direction was deposited (September 25, 2013). Accordingly, the BCUC must issue the order in accordance with section 3(3) of the Direction by October 25, 2013.

(3) Within 30 days of the date this direction comes into force, the commission must issue an order so that the Electric Tariff of the authority is amended by adding the provisions set out in the Appendix to this direction.

1.10.1 Please confirm that BCUC Order G-166-13 Electric Tariff Terms and Conditions issued October 9, 2013 fulfills all the requirements of the Direction required to be undertaken by October 25th, 2013 pursuant to sections 3(3) and the requirement to establish a regulatory account pursuant to section 3(2).

RESPONSE:

Confirmed.

10.0 Exhibit B-1, page 1-7, (with footnote) and Appendix B page 3 of 7

17 To comply with the Direction, the BCUC is required to issue an order pursuant to
18 section 3(3) by October 25, 2013.[7]

[7] Pursuant to section 4 of the Regulations Act, Direction No. 4 became effective on the date the Direction was deposited (September 25, 2013). Accordingly, the BCUC must issue the order in accordance with section 3(3) of the Direction by October 25, 2013.

(3) Within 30 days of the date this direction comes into force, the commission must issue an order so that the Electric Tariff of the authority is amended by adding the provisions set out in the Appendix to this direction.

1.10.1.1 If not, please specify any requirements that were not fulfilled.

RESPONSE:

Please refer to the response to CEC IR 1.10.1.

11.0 Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

1.11.1 Has BC Hydro already, or does BC Hydro expect to apply the Failed Installation charge to customers prior to the requested November 29, 2013 BCUC decision date.

RESPONSE:

BCUC Order No. G-166-13 approved the Failed Installation Charge on an interim and refundable basis, effective October 25, 2013.

11.0 Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

1.11.2 Please confirm or otherwise explain that if the failed installation charge already applied to customers, and was subsequently adjusted upward on a final basis effective October 25, 2013, that BC Hydro would seek to recover the difference from those customers to whom it applies.

RESPONSE:

BC Hydro notes the Failed Installation Charge is approved on an interim and refundable basis as per BCUC Order No. G-166-13, effective as of October 25, 2013. As such, BC Hydro confirms that if a BCUC decision determines the final Failed Installation Charge should be more than BC Hydro's proposal of $65, BC Hydro would seek to recover the difference from those customers where the Failed Installation Charge was applied as an interim approved charge, unless otherwise directed by the BCUC.

11.0 Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

1.11.2 Please confirm or otherwise explain that if the failed installation charge already applied to customers, and was subsequently adjusted upward on a final basis effective October 25, 2013, that BC Hydro would seek to recover the difference from those customers to whom it applies.

1.11.2.1 If not confirmed, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.11.2.

11.0 Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

1.11.2.2 If not confirmed, would BC Hydro recover its costs from failed installations to the extent that they exceeded the failed installation charges, from all customers?

RESPONSE:

Please refer to the response to CEC IR 1.11.2.

11.0 Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

1.11.2.2.1 If yes, would these costs be incorporated into the SMI Regulatory account?

RESPONSE:

Please refer to the response to CEC IR 1.11.2.

11.0 Exhibit B-1, page 1-8

- Approves the failed installation charge, as shown in the schedule of Miscellaneous Charges in the Second Revision of Page 40 of the Electric Tariff filed in Appendix C of the Application, on a final basis effective as of October 25, 2013

1.11.2.2.2 If not, how would BC Hydro recover these costs?

RESPONSE:

Please refer to the response to CEC IR 1.11.2.

12.0 Exhibit B-1, page 1-8

- Approves in accordance with section 3(2) of Direction No. 4, BC Hydro adding to its existing SMI Regulatory Account the program costs, investigation costs and infrastructure costs that are not recovered from eligible customers at premises where a legacy meter or radio off meter is installed, and costs related to smart meters, which are incurred during the period January 1, 2013 to March 31, 2014

1.12.1 Please confirm that the regulatory costs associated with this proceeding will be recovered from all customers.

RESPONSE:

Confirmed.

12.0 Exhibit B-1, page 1-8

- Approves in accordance with section 3(2) of Direction No. 4, BC Hydro adding to its existing SMI Regulatory Account the program costs, investigation costs and infrastructure costs that are not recovered from eligible customers at premises where a legacy meter or radio off meter is installed, and costs related to smart meters, which are incurred during the period January 1, 2013 to March 31, 2014

1.12.1.1 If not confirmed, please identify the customer groups from whom the regulatory costs will be recovered.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.12.1.

13.0 Exhibit B-1, page 2-3

When a customer requested the smart meter installation at their premises be put on hold, a dedicated customer service representative contacted the customer to answer their questions, and sought agreement to proceed with the meter exchange. These customers were advised that they had the option to relocate the smart meter at their cost, either to another location on their property or to nearby BC Hydro infrastructure.

1.13.1 How many customers undertook to relocate the smart meter at their cost, either to another location on their property or to nearby BC Hydro infrastructure?

RESPONSE:

Customers relocate their meter base for a number of reasons. BC Hydro's records do not identify the customer's reason for relocating the meter base.

13.0 Exhibit B-1, page 2-3

> When a customer requested the smart meter installation at their premises be put on hold, a dedicated customer service representative contacted the customer to answer their questions, and sought agreement to proceed with the meter exchange. These customers were advised that they had the option to relocate the smart meter at their cost, either to another location on their property or to nearby BC Hydro infrastructure.

1.13.2 Does BC Hydro expect these customers to attempt to recover their costs from BC Hydro as a result of the change in policy?

RESPONSE:

No.

13.0 Exhibit B-1, page 2-3

When a customer requested the smart meter installation at their premises be put on hold, a dedicated customer service representative contacted the customer to answer their questions, and sought agreement to proceed with the meter exchange. These customers were advised that they had the option to relocate the smart meter at their cost, either to another location on their property or to nearby BC Hydro infrastructure.

1.13.2.1 If so, please provide BC Hydro's estimation of the total costs that customers might attempt to recover from BC Hydro.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.13.2.

14.0 Exhibit B-1, page 2-5

Date	Communications Activity
Week of September 2	Enrolment period begins Bchydro.com communications updates
Week of September 9	Meter Choices letter and factsheet to eligible residential customers
Week of September 16	Letter to commercial customers
September 9 to December 1	Receive customer enrolment forms and send confirmation to customers. Send meter replacement notification to customers request to keep old meter but have expired seals.
Week of October 15 and November 15	Reminder letters sent to eligible customers
December 1	Enrolment period ends

1.14.1 Please confirm that BC Hydro expects to have a relatively firm estimation of the number of customers who will choose legacy meters and the number who will choose radio off by December 1, 2013.

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.1.

14.0 Exhibit B-1, page 2-5

Date	Communications Activity
Week of September 2	Enrolment period begins Bchydro.com communications updates
Week of September 9	Meter Choices letter and factsheet to eligible residential customers
Week of September 16	Letter to commercial customers
September 9 to December 1	Receive customer enrolment forms and send confirmation to customers. Send meter replacement notification to customers request to keep old meter but have expired seals.
Week of October 15 and November 15	Reminder letters sent to eligible customers
December 1	Enrolment period ends

1.14.1.1 If not, please explain when BC Hydro expects to have a relatively firm estimation of the customers participating in each aspect of the meter choices program.

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.1.

14.0 Exhibit B-1, page 2-5

Date	Communications Activity
Week of September 2	Enrolment period begins Bchydro.com communications updates
Week of September 9	Meter Choices letter and factsheet to eligible residential customers
Week of September 16	Letter to commercial customers
September 9 to December 1	Receive customer enrolment forms and send confirmation to customers. Send meter replacement notification to customers request to keep old meter but have expired seals.
Week of October 15 and November 15	Reminder letters sent to eligible customers
December 1	Enrolment period ends

1.14.2 How many letters were sent to commercial customers?

RESPONSE:

Please refer to the response to BCSEA IR 1.10.1.5.

14.0 Exhibit B-1, page 2-5

Date	Communications Activity
Week of September 2	Enrolment period begins Bchydro.com communications updates
Week of September 9	Meter Choices letter and factsheet to eligible residential customers
Week of September 16	Letter to commercial customers
September 9 to December 1	Receive customer enrolment forms and send confirmation to customers. Send meter replacement notification to customers request to keep old meter but have expired seals.
Week of October 15 and November 15	Reminder letters sent to eligible customers
December 1	Enrolment period ends

1.14.3 What proportion of those customers who have refused smart meter service to date have been commercial customers?

RESPONSE:

Please refer to the response to BCUC IR 1.1.4.

15.0 Exhibit B-1 page 2-6

An enrolment form, a pre-paid return envelope and a factsheet with more information about the choices is enclosed with the letter. BC Hydro will confirm a customer's choice by letter, email or phone call.

1.15.1 What was the total cost of the pre-paid return envelopes?

RESPONSE:

The total cost of the pre-paid return envelopes only was $5,791.

15.0 Exhibit B-1 page 2-6

> An enrolment form, a pre-paid return envelope and a factsheet with more information about the choices is enclosed with the letter. BC Hydro will confirm a customer's choice by letter, email or phone call.

1.15.2 Will BC Hydro also send pre-paid return enveloped for the Reminder Letter?

RESPONSE:

Yes.

16.0 Exhibit B-1, page 2-7

> 9 If a customer with a legacy meter in place moves to another premises, the customer
> 10 will not be permitted to have a legacy meter installed at the new premises. The
> 11 customer may choose to have a radio-off meter installed at the new premises or
> 12 accept the standard smart meter.

1.16.1 Please confirm or otherwise explain that even if a customer moves to a premise that had a legacy meter in place, they will not be permitted to keep the legacy meter in the new premises.

RESPONSE:

Confirmed.

17.0 Exhibit B-1, page 2-7 and Appendix B page 7 of 7

Eligible customers who choose or are deemed to choose the radio-off meter option will be able to retain this meter indefinitely. If a customer with a radio-off meter in place moves to another premises, the customer may choose to have a radio-off meter installed at the new premises or accept the standard smart meter.

(c) A Customer with a Radio-off Meter in place whose service is terminated for any reason whatsoever, but who again takes Residential Service at the same or another premises may elect to have either a Smart Meter or a Radio-off Meter installed upon resumption of service.

1.17.1 Please confirm, or otherwise explain, that customers who choose or are deemed to have the radio-off meter either now, or in the future as a result of having had a legacy meter retired are essentially 'grandfathered'.

RESPONSE:

BC Hydro does not fully understand what is meant by the term "essentially grandfathered" as used in the question, and therefore is not able to comment. Radio-off meters may remain in place in accordance with section 4.2.4 of the BC Hydro Electric Tariff.

17.0 Exhibit B-1, page 2-7 and Appendix B page 7 of 7

Eligible customers who choose or are deemed to choose the radio-off meter option will be able to retain this meter indefinitely. If a customer with a radio-off meter in place moves to another premises, the customer may choose to have a radio-off meter installed at the new premises or accept the standard smart meter.

(c) A Customer with a Radio-off Meter in place whose service is terminated for any reason whatsoever, but who again takes Residential Service at the same or another premises may elect to have either a Smart Meter or a Radio-off Meter installed upon resumption of service.

1.17.2 Please explain if the 'grandfathering' would only be attributed to the account holder or if it would be attributed to any person residing in premises with a radio-off meter.

RESPONSE:

The radio-off meter may remain installed at the premises as long as the named account holder does not change with the exception of the circumstances described in the response to BCSEA IR 1.7.6.

17.0 Exhibit B-1, page 2-7 and Appendix B page 7 of 7

Eligible customers who choose or are deemed to choose the radio-off meter option will be able to retain this meter indefinitely. If a customer with a radio-off meter in place moves to another premises, the customer may choose to have a radio-off meter installed at the new premises or accept the standard smart meter.

(c) A Customer with a Radio-off Meter in place whose service is terminated for any reason whatsoever, but who again takes Residential Service at the same or another premises may elect to have either a Smart Meter or a Radio-off Meter installed upon resumption of service.

1.17.2.1 If the 'grandfathering' is attributable only to the account holder, how does BC Hydro intend to address customers, or multiple customers, who reside in a home with a radio-off meter and wish to retain a 'radio-off' meter in the event of a move, but are not the account holder – such as the circumstances that may apply in the case of renters where electricity is included in rent, or in situations such as divorce, separation, or death of the account holder? Please explain BC Hydro's policies with respect to such circumstances.

RESPONSE:

Customers who are eligible for Meter Choices will be tracked using a flag in SAP at a customer level. That flag is attributable only to the named account holder. Only those named account holders are eligible for the program going forward with the exception discussed in BCSEA IR 1.7.6. If that named account holder moves, they retain that Meter Choices flag. Eligibility is not transferrable to another party.

17.0 Exhibit B-1, page 2-7 and Appendix B page 7 of 7

Eligible customers who choose or are deemed to choose the radio-off meter option will be able to retain this meter indefinitely. If a customer with a radio-off meter in place moves to another premises, the customer may choose to have a radio-off meter installed at the new premises or accept the standard smart meter.

(c) A Customer with a Radio-off Meter in place whose service is terminated for any reason whatsoever, but who again takes Residential Service at the same or another premises may elect to have either a Smart Meter or a Radio-off Meter installed upon resumption of service.

1.17.2.2 If the 'grandfathering' is attributable to those people residing in a premise with the radio-off, and wish to retain that option, how will BC Hydro confirm the legitimacy of those requests.

RESPONSE:

Please refer to the response to CEC IR 1.17.2.1.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.1 Please confirm that BC Hydro will continue to be installing smart meters throughout the period between December 2013 and April 1, 2014.

RESPONSE:

Confirmed.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.2 Please confirm that BC Hydro expects to only be able to install 5,000 radio off meters over a period of about 4 months.

RESPONSE:

Not confirmed.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.2.1 If not confirmed, please explain why not.

RESPONSE:

The number of radio-off meters that can be installed in the specified period depends upon a number of factors including, location of installations, weather conditions, and availability of installation resources. BC Hydro expects to begin installing radio-off meters in February 2014, and expects to be substantially complete by April 2014.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.3 Would BC Hydro consider the rate of 1,250 meters/month to be an accurate approximation of the rate at which it expects to be installing radio-off meters?

RESPONSE:

No.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.3.1 If not, please explain why not.

RESPONSE:

As noted in the response to CEC IR 1.18.2.1, BC Hydro expects to begin the installation of radio-off meters in February 2014. Assuming 5,000 customers choose the radio-off meter installation option, the install rate is expected to be more than 2,000 per month.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.4 Could BC Hydro expect to install significantly more meters over the same period if there were considerably more radio off customers than anticipated?

RESPONSE:

The ability to install significantly more meters over the same period is uncertain.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.4.1 Please explain why or why not.

RESPONSE:

Please refer to the response to CEC IR 1.18.2.1.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.4.2 If yes, please provide the maximum number of radio off meters that BC Hydro could reasonably install between December 2, 2013 and April 1, 2014.

RESPONSE:

Please refer to the response to CEC IR 1.18.2.1.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.5 Over how many months did BC Hydro install the 1.8 million smart meters that are distributed throughout its service territory?

RESPONSE:

Mass meter deployment was 18 months (July 2011 through December 2012).

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.6 Would BC Hydro agree that installing the radio-off meters under the meter choice program will be much more time consuming at a high level on a per meter installation than the original installation of smart meters has been?

RESPONSE:

Agreed, due to the ad hoc and lower density nature of radio-off meter installations relative to the mass deployment of smart meters.

18.0 Exhibit B-1, page 2-7

> For eligible customers who choose the radio-off meter option, BC Hydro will need to deploy radio-off meters as described in section 3.4.1.1 of this application. Deployment of radio-off meters is projected to take several months as a consequence of winter conditions and the large and diverse geographical region served by BC Hydro. Deployment is expected to be substantially completed by April 2014. Accordingly, BC Hydro proposes that the charges for having a radio-off meter installed at the premises become effective April 1, 2014.

1.18.6.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.18.6.

19.0 Exhibit B-1, page 3-1

> 9 For eligible customers who choose to retain a legacy meter, the meters will have to
> 10 be read manually at the customer's premises.

1.19.1 Will customers who retain a legacy meter have the option of reading the meter themselves and reporting the reading to BC Hydro at a regular interval?

RESPONSE:

Please refer to the response to BCUC IR 1.9.2.

19.0 Exhibit B-1, page 3-1

> 9 For eligible customers who choose to retain a legacy meter, the meters will have to
> 10 be read manually at the customer's premises.

1.19.1.1 Please provide the rationale for why or why not.

RESPONSE:

Please refer to the response to BCUC IR 1.9.2.

20.0 Exhibit B-1, page 3-2

> BC Hydro considers the proposed charges appropriate for the anticipated initial level of participation in the Meter Choices Program, as discussed in the next section. The charges have been developed so that the costs incurred to offer these options are expected to be recovered from those customers who choose to participate in the program, and not from other BC Hydro ratepayers.
>
> Revenues from the new standard charges will be recorded as "Miscellaneous Revenue." BC Hydro will monitor both revenues and costs for the program to evaluate whether the standard charges are recovering the program costs.

1.20.1 Will BC Hydro provide updates to the Commission as to whether the standard charges are fully recovering program costs?

RESPONSE:

Yes, BC Hydro will provide an update to the BCUC when it next seeks approval to update the charges. Please refer to the response to BCSEA IR 1.16.1.

20.0 Exhibit B-1, page 3-2

> BC Hydro considers the proposed charges appropriate for the anticipated initial level of participation in the Meter Choices Program, as discussed in the next section. The charges have been developed so that the costs incurred to offer these options are expected to be recovered from those customers who choose to participate in the program, and not from other BC Hydro ratepayers.
>
> Revenues from the new standard charges will be recorded as "Miscellaneous Revenue." BC Hydro will monitor both revenues and costs for the program to evaluate whether the standard charges are recovering the program costs.

1.20.1.1 If so, please explain the process by which the Commission and interveners will be able to determine if the standard charges are recovering costs and when such processes might occur.

RESPONSE:

Please refer to the responses to BCUC IR 1.6.5.2 and BCSEA IR 1.16.1.

20.0 Exhibit B-1, page 3-2

> BC Hydro considers the proposed charges appropriate for the anticipated initial level of participation in the Meter Choices Program, as discussed in the next section. The charges have been developed so that the costs incurred to offer these options are expected to be recovered from those customers who choose to participate in the program, and not from other BC Hydro ratepayers.
>
> Revenues from the new standard charges will be recorded as "Miscellaneous Revenue." BC Hydro will monitor both revenues and costs for the program to evaluate whether the standard charges are recovering the program costs.

1.20.1.2 Please confirm that if the standard charges are not recovering costs, that BC Hydro would seek to increase the standard charges to the point that they are fully recovering program costs.

RESPONSE:

BC Hydro will address any potential changes to the Meter Choices Program charges when it updates its other standard charges in a future rate design application.

20.0 Exhibit B-1, page 3-2

> BC Hydro considers the proposed charges appropriate for the anticipated initial level of participation in the Meter Choices Program, as discussed in the next section. The charges have been developed so that the costs incurred to offer these options are expected to be recovered from those customers who choose to participate in the program, and not from other BC Hydro ratepayers.
>
> Revenues from the new standard charges will be recorded as "Miscellaneous Revenue." BC Hydro will monitor both revenues and costs for the program to evaluate whether the standard charges are recovering the program costs.

1.20.1.2 Please confirm that if the standard charges are not recovering costs, that BC Hydro would seek to increase the standard charges to the point that they are fully recovering program costs.

1.20.1.2.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.20.1.2.

20.0 Exhibit B-1, page 3-2

BC Hydro considers the proposed charges appropriate for the anticipated initial level of participation in the Meter Choices Program, as discussed in the next section. The charges have been developed so that the costs incurred to offer these options are expected to be recovered from those customers who choose to participate in the program, and not from other BC Hydro ratepayers.

Revenues from the new standard charges will be recorded as "Miscellaneous Revenue." BC Hydro will monitor both revenues and costs for the program to evaluate whether the standard charges are recovering the program costs.

1.20.1.2.2 If not, please explain if BC Hydro has established any which would trigger a request for an increase in standard charges.

RESPONSE:

Please refer to the response to CEC IR 1.20.1.2.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.1 On what basis did BC Hydro predict that there will be between 5,000 and 20,000 program participants?

RESPONSE:

As indicated in the Application, the proposed charges are based on 10,000 customers participating in the Meter Choices Program. This level of participation and the range of potential participation levels provided in the cost analysis would seem to reflect the likely range of possible outcomes, based on the experience of other jurisdictions and the number of BC Hydro customers who have to-date refused the installation of a smart meter.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.1.1 If BC Hydro selected the estimated opt-out rate based on program participation for other utilities, is BC Hydro aware if these utilities had significant numbers of customers refusing smart meter installation prior to choosing opt out service?

RESPONSE:

Anecdotally, BC Hydro is aware that some jurisdictions had customers refusing the installation of a smart meter prior to choosing to participate in the utility's opt-out program.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.1.1.1 If so, please provide any conversion rates BC Hydro is aware of for other utilities in which customers originally refused smart meters and then accepted smart meters once the program was established.

RESPONSE:

BC Hydro does not have any data related to the conversion rates of the customers in other jurisdictions.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.1.2 Did BC Hydro conduct any high level sensitivity analysis for 30,000, 40,000, 50,000 or 60,000 customers opting out?

RESPONSE:

High-level sensitivity analyses which capture these ranges of participation rates have not been undertaken.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.1.2.1 If so, please provide the result of such senstivity analysis.

RESPONSE:

Please refer to the response to CEC IR 1.21.2.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.2 On what basis did BC Hydro determine that 50% of Meter Choices Program Participants will choose a radio-off meter and 50% will choose a legacy meter?

RESPONSE:

BC Hydro does not have any empirical data that could be used to assess which proportion of customers would choose the legacy meter option and which proportion would choose the radio-off meter option. In the absence of any such empirical data, the expected level of participation was allocated evenly between each meter option.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.2.1 Please provide any reference information that BC Hydro relied upon in making this determination.

RESPONSE:

Please refer to the response to CEC IR 1.21.2.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.2.2 Would BC Hydro agree that a high initial charge could discourage participation in the legacy meter program relative to the radio off program?

RESPONSE:

It is uncertain as to whether or not a high initial charge for the legacy meter option would discourage participation in either absolute terms or relative to the level of participation for the radio-off option. Since charges are calculated on a cost recovery basis, all else being equal, a high initial charge would result in a lower monthly charge. The impact on participation would depend on the customer preference for an initial charge relative to a monthly charge. BC Hydro does not have an opinion regarding these preferences.

21.0 Exhibit B-1, page 3-4

> BC Hydro believes the number of its customers who choose either a radio-off or legacy meter will likely fall within the range of 5,000 to 20,000 (i.e., 0.3 per cent to 1.2 per cent of customers), and proposes charges aligned to approximately 10,000 or about 0.6 per cent of customers choosing either of these options. It is further assumed that of the 10,000 Meter Choices Program participants, 50 per cent (5,000) will choose a radio-off meter, and 50 per cent (5,000) will choose a legacy meter.

1.21.2.2.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.21.2.2.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

Table 3-2 Opt-Out Programs for Other Utilities

Utility	Initial Charge ($)	Monthly Charge ($)	Mass Deployment Status	Participation	
				Number	Percent (%)
Pacific Gas & Electric[1]	75	10	Ongoing	36,000	0.6
San Diego Gas & Electric[1]	75	10	99.6% Complete	1,800	0.2
Central Maine Power[2]	20	11	Ongoing	8,000	1.3
Portland General Electric[2]	251	51	Complete	4	0.0
NV Energy	53	9	Ongoing	7,500[3]	0.5
Hydro Quebec	98	17	Ongoing	402	0.2

[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.1 Please provide BC Hydro's views of the relative importance of having a high initial charge or having high monthly charges and identify which factors it believes are more important to customers in choosing to participate in the Meter Choices Program.

RESPONSE:

Please refer to the responses to BCUC IR 1.2.4 and CEC IR 1.21.2.2.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

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[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.1.1 Would BC Hydro agree that high initial charges are 'traded off' in a customer's mind vs. higher monthly charges. If not, please explain why not.

RESPONSE:

Agreed. Please refer to the response to CEC IR 1.21.2.2.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

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[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.2 Would BC Hydro agree that a high initial charge is a barrier for a customer to commence participating in the meter choices program?

RESPONSE:

Please refer to the response to CEC IR 1.21.2.2.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

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[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.2.1 Please explain why or why not.

RESPONSE:

Please refer to the response to CEC IR 1.21.2.2.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

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[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.3 Would BC Hydro agree that customers might be more likely to enroll in the meter choices program and then drop out after a short period if there was a higher monthly fee and no initial fee than they would if there was a high initial fee and lower monthly fees? Please explain why or why not.

RESPONSE:

Please refer to the response to CEC IR 1.21.2.2.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

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[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.4 Would BC Hydro agree that the situation in which a customer enrolled in the choices program and then dropped out shortly thereafter would be exacerbated by the 'Do Nothing' option serving to enroll them?

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.1.

22.0 Exhibit B-1, page 3-3 and page 3-4, Table 3-2

of customers (1,800 out of about 1.2 million customers). In May 2011, Central Maine Power began offering a smart meter opt-out program, and by fall of 2012 participation in the program was 1.3 per cent (8,000 out of 620,000 customers), although they have since reported declining participation rates from this initial level.

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[1] The rate for low income qualified customers is an initial charge of $10 and a monthly charge of $5.
[2] As of Fall 2012.
[3] NV Energy forecast.

1.22.4.1 Please explain why or why not.

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.1.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.1 Does BC Hydro have any evidence that customers are equally predisposed to accepting a radio off meter as they are to retaining their analog meter?

RESPONSE:

Please refer to the response to CEC IR 1.21.2.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.1.1 If so, please provide.

RESPONSE:

Please refer to the response to CEC IR 1.21.2.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.2 Would BC Hydro agree that several customer issues raised with respect to the move to 'smart meters' are not solely related to the wireless aspect but include concerns related to the type and frequency of information collected,

RESPONSE:

Agreed. Some customers have cited privacy concerns as a reason for their refusal of a smart meter installation.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.3 Did BC Hydro conduct sensitivity analysis with respect to the proportion of radio-off meters and legacy meters?

RESPONSE:

No.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.3.1 If not, why not?

RESPONSE:

BC Hydro has provided costs for a relatively broad range of the Meter Choices Program participation levels, and it is believed that this range brackets the range of likely outcomes. The provision of additional sensitivities did not seem to be particularly informative given the lack of empirical information that would suggest that one split between legacy meters and radio-off meters would be more probable than another.

Please also refer to the response to CEC IR 1.21.2.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.4 If so, please provide the results of any sensitivity analysis BC Hydro conducted with respect to the proportion of customers choosing radio-off or legacy meters.

RESPONSE:

Please refer to the response to CEC IR 1.23.3.1.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.5 Would BC Hydro agree that, with respect to incurring initial fees, customers will be more incented to stay with the analog meters than they would be to adopt meters with the radio turned off?

RESPONSE:

Please refer to the response to CEC IR 1.21.2.2.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.6 Would BC Hydro agree that many people find it easier to pay an additional $15 per month than it is to pay an initial fee of $100?

RESPONSE:

Please refer to the response to CEC IR 1.21.2.2.

23.0 Exhibit B-1, page 3-5

> In determining the proposed charges for the Meter Choices Program, costs that are common to both the radio-off and legacy meter options (e.g., Information Technology) have been split based on the assumed ratio of customers choosing each option (i.e., 50 per cent radio-off meters and 50 per cent legacy meters) and have been allocated accordingly. In instances where costs are attributable to one meter option but not the other, these costs have been fully allocated to the option which causes these particular costs to be incurred.

1.23.6.1 If not, please provide evidence that customers are equally interested in accepting a $100 initial fee as they would be in accepting a $15 monthly premium.

RESPONSE:

BC Hydro does not have evidence regarding a customer's willingness to pay a $15 per month premium to avoid a $100 initial charge, nor does it have evidence to suggest otherwise.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.1 Would BC Hydro agree that it would have been considerably less expensive to deploy smart meters throughout the service territory at the same time, rather than to have a second deployment for a small number of customers?

RESPONSE:

Yes.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.1.1 If not, please explain why not.

RESPONSE:

Not applicable.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.2 Please provide a total high level estimated cost of the December 2013 to April 2014 deployment of radio off smart meters as well as the cost per radio off meter installed compared to the cost per meter installed for the initial smart meter implementation.

RESPONSE:

The cost to install 5,000 radio-off meters during the February to April 2014 period is estimated at $275,000 (i.e., 5,000 x $55). On a per unit basis, this is about $25 greater than the smart meter installation cost incurred during mass meter deployment.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.3 Would BC Hydro agree that the cost of this deployment is directly attributable to the customers who requested deferral of the smart meters, and the costs associated with providing the Choice program.

RESPONSE:

Agreed.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.3.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.24.3.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.3.2 Would BC Hydro agree that the additional cost of installation for those customers who deferred the installation but ultimately receive a wireless smart meter could reasonably be attributed to the cost of providing regular SMI service; whereas the cost of deferred installation for customers who do not select a wireless smart meter could reasonably be attributed to the costs of the Choice program?

RESPONSE:

Not agreed.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.3.2.1 Please explain why or why not.

RESPONSE:

Such an approach would create an inconsistent treatment of customers who choose smart meter compared to customers who choose the installation of a radio-off meter. In the first case, a cost is incurred to exchange a legacy meter for a smart meter, and in the second case a similar cost is incurred to exchange a legacy meter for a radio-off meter, so if the first customer is not charged for the exchange then neither should the second. In the second case, and as part of the initial fee, the customer choosing the radio-off option does pay the cost to exchange the radio-off meter for a smart meter when the customer moves from the premises decides to have a smart meter installed (i.e., leaves the Meter Choices Program).

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.4 Does BC Hydro agree that the legacy meters currently in place will require more frequent exchanges than smart meters?

RESPONSE:

Agreed.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.4.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.24.4.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.5 What is the average service life of the Itron OpenWay Smart Meter?

RESPONSE:

The service life of any Itron OpenWay smart meter is estimated at 20 years.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.5.1 What is the average remaining service life of the legacy meters that remain installed and of those that will be in inventory?

RESPONSE:

BC Hydro does not have information regarding the average remaining life of these legacy meters. Legacy meters will be taken out of service upon expiration of the Measurement Canada seal, and it is expected that very few will be taken out of service before this time due to the meter not functioning properly. Accordingly, the remaining meter life is very likely constrained by the Measurement Canada seal rather than the technical longevity of the meter. Schedule A-9 in Appendix I identifies the distribution of seal expiration dates for legacy meters that remain in service, and this information is reproduced below:

Percentage of Meters		
	Expiring (%)	**Cumulative (%)**
< 2013	**29.7**	**29.7**
2013	**10.3**	**40.1**
2014	**13.5**	**53.5**
2015	**7.7**	**61.2**
2016	**12.0**	**73.2**
2017	**1.7**	**75.0**
2018	**18.0**	**92.9**
2019	**2.7**	**95.7**
2020	**3.2**	**98.9**
2021	**1.1**	**100.0**

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.6 Does BC Hydro agree that replacing legacy meters with older legacy meters from inventory can reasonably be expected to result in a continuous shortening of the remaining service life of the legacy meters as they are replaced?

RESPONSE:

Not agreed.

24.0 Exhibit B-1, page 3-6

> For premises where the existing installed meter is a legacy meter, it is proposed that neither customers choosing a smart meter nor customers choosing a radio-off meter will be charged directly for the meter exchange (these costs will be treated in the same manner as other smart meter deployment costs). [17]

1.24.6.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.24.5.1.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.1 Please confirm that the total capital cost per customer ranges from approximately $553.35 to $332.04 per customer to undertake the Meter Choices customer program.

RESPONSE:

Confirmed.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.2 Please extend the table to include 2,500; 30,000; 40,000; 50,000; and 60,000 customers.

RESPONSE:

The tables cannot be extended beyond 20,000 participants without a great deal of further analysis and additional work effort. In BC Hydro's view, the range of participation levels provided in the Application is representative of the likely range of outcomes and an extension of the table beyond 20,000 participants would not be particularly informative. In addition, levels of participation in the Meter Choices Program in excess of 20,000 (with 10,000 of these customers choosing the legacy meter option) would make the legacy meter option unsustainable beyond a year or two due to a lack of legacy meters in inventory.

Please refer to the response to BCUC IR 1.6.2.1 for estimates assuming 3,300 to 8,300 customers choose to participate in the Meter Choices Program.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.3 When will BC Hydro determine how much capital equipment is required and incur the capital costs associated with number of meter choices customers determined as of December 1, 2013.

RESPONSE:

It is expected that actual expenditures on some capital related items will occur throughout the 2014 calendar year. This includes expenditures on IT infrastructure which are scheduled to occur March 2014, and purchases of telecom infrastructure which will likely occur during calendar 2014 as the telecom network is optimized. The number of FMAs and hence handheld units required is not expected to be known for several months following December 1, 2013.

25.0 Exhibit B-1, page 3-5, Table 3-3

10 Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4 Please confirm or otherwise explain that there would be no increase or decrease to the Information Technology requirements or costs regardless of the number of Meter Choices customers.

RESPONSE:

Confirmed, if the actual participation is within the expected range of participation in the Meter Choices Program (i.e., 5,000 to 20,000 program participants).

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.1 How often will Information Technology updates be required?

RESPONSE:

Updates are required periodically to implement new functionality and to apply patches and bug fixes where necessary. The schedule of upgrades will depend on each software vendor and BC Hydro's future requirements. BC Hydro does not have a schedule of these updates and upgrades.

25.0 Exhibit B-1, page 3-5, Table 3-3

10 Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.2 Please explain with quantification why the costs of Meter Reading Handheld Units declines on a per customer basis from $10.45 to $5.80 depending on the number of customers.

RESPONSE:

The number of handheld units required is equal to the number of FMAs. The number of FMAs required is based on the theoretical distance between manual reads, and the underlying function is not linear. As a consequence, the number of FMAs required and hence the number of handheld units required does not vary linearly with the number customers choosing to participate in the Meter Choices Program. Schedule A-8 in Appendix I provides the details of the methodology used to estimate the number of FMAs.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.3 What is the service life of handheld meter reading units?

RESPONSE:

The life of the handheld units is estimated at three years.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.4 Please confirm that the cost of incremental check meters increases at a rate of $200,000 per 5,000 customers, or approximately $40 per customer after the first 5,000 customers.

RESPONSE:

The estimated number of check meters required by the number of legacy meter customers is provided in the following table.

Legacy Meter Customers	Check Meters Required	Total Cost ($)	Cost Per Customer ($)
2,500	200	400,000	160
5,000	300	600,000	240
7,500	400	800,000	320
10,000	500	1,000,000	400

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.5 Is there a minimum number of incremental check meters that would be required for a smaller number of meter choices customers?

RESPONSE:

If no customers choose the legacy meter option, then no incremental check meters would be required.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.5.1 If so, please explain with quantification as to the minimum expense for incremental check meters.

RESPONSE:

Please refer to the response to CEC IR 1.25.4.5.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.6 What is the service life of Incremental Check Meters?

RESPONSE:

The life of the check meters is estimated at five years.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.7 Is the Incremental Telecom Infrastructure cost directly variable with the number of meter choices customers?

RESPONSE:

It is expected that the incremental telecom infrastructure cost will vary directly with the number of Meter Choices Program customers.

25.0 Exhibit B-1, page 3-5, Table 3-3

Table 3-3 Capital and Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Capital Costs ($)[16]				
Information Technology	1,238,577	1,238,577	1,238,577	1,238,577
Meter Reading Handheld Units	52,233	81,251	98,662	116,073
Incremental Check Meters	400,000	600,000	800,000	1,000,000
Incremental Telecom Infrastructure	1,075,958	2,148,388	3,220,817	4,286,192
Total Capital Costs	**2,766,768**	**4,068,216**	**5,358,056**	**6,640,842**

1.25.4.7.1 Please explain if the Incremental telecom infrastructure is a combined fixed and variable cost, or is a fully variable cost.

RESPONSE:

As indicated in Schedule A-7a of Appendix I, the incremental telecom infrastructure cost is a fully variable cost.

26.0 Exhibit B-1, page 3-6 to 3-7

> The cost of a meter exchange is estimated at $55, based on the average (weighted by region) cost of attendance at a customer's premises to install a smart meter (across BC Hydro's service territory) by BC Hydro's contractors. The underlying contractor costs apply to relatively low volume meter exchanges, and should be a good proxy for the cost to install radio-off meters.

1.26.1 Please confirm or otherwise explain that the 'weighted by region' factor would expect to be similar in the meter choices program as it is across BC Hydro's service territory.

RESPONSE:

Confirmed.

26.0 Exhibit B-1, page 3-6 to 3-7

> The cost of a meter exchange is estimated at $55, based on the average (weighted by region) cost of attendance at a customer's premises to install a smart meter (across BC Hydro's service territory) by BC Hydro's contractors. The underlying contractor costs apply to relatively low volume meter exchanges, and should be a good proxy for the cost to install radio-off meters.

1.26.2 What is the relatively low volume of meter exchanges to which $55 applies as a cost to install radio-off meters?

RESPONSE:

The $55 cost is based on an ad hoc smart meter to smart meter exchange.

26.0 Exhibit B-1, page 3-6 to 3-7

The cost of a meter exchange is estimated at $55, based on the average (weighted by region) cost of attendance at a customer's premises to install a smart meter (across BC Hydro's service territory) by BC Hydro's contractors. The underlying contractor costs apply to relatively low volume meter exchanges, and should be a good proxy for the cost to install radio-off meters.

1.26.3 Does the meter exchange cost of $55 incorporate a cost for travel time based on a small number of meters dispersed over a wide geographic territory as opposed to a large number of meters dispersed over a wide geographic territory?

RESPONSE:

Travel time is included in the $55 estimate on a weighted average basis. This estimate is based on the charge for ad hoc smart meter to smart meter exchanges by the mass meter deployment vendor during the mass deployment of smart meters. Since during mass meter deployment the vendor had facilities and employees throughout the BC Hydro service territory, the weighted average installation cost was grossed-up by 10 per cent in calculating the $55 estimate. It is uncertain whether or not this 10 per cent factor will adequately reflect the incremental cost resulting from a potential increase in travelling time, and this will not be known until the number and location of these meters has been determined.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
EVP Changes	40,320	40,320	40,320	40,320
Grid Director Changes	40,320	40,320	40,320	40,320
Analytics Changes	43,992	43,992	43,992	43,992
Reports Changes	80,640	80,640	80,640	80,640
Testing Effort	201,430	201,430	201,430	201,430
Integration Effort	81,739	81,739	81,739	81,739
Project Management	108,480	108,480	108,480	108,480
Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.1 When, and over what period of time will BC Hydro incur the Radio Off information technology capital costs?

RESPONSE:

Information Technology costs are scheduled to occur during the period from September 2013 to March 2014.

Please note that the heading on Table 3-4 should read "Meter Choices Program Information Technology Capital costs."

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
EVP Changes	40,320	40,320	40,320	40,320
Grid Director Changes	40,320	40,320	40,320	40,320
Analytics Changes	43,992	43,992	43,992	43,992
Reports Changes	80,640	80,640	80,640	80,640
Testing Effort	201,430	201,430	201,430	201,430
Integration Effort	81,739	81,739	81,739	81,739
Project Management	108,480	108,480	108,480	108,480
Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.2 Please explain what BC Hydro means by ‘enterprise applications’.

RESPONSE:

Please refer to the response to BCUC IR 1.8.3.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
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Project Management	108,480	108,480	108,480	108,480
Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.3 How often does BC Hydro expect to require IT upgrades to the Radio Off information technology?

RESPONSE:

Please refer to the response to CEC IR 1.25.4.1.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
EVP Changes	40,320	40,320	40,320	40,320
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Integration Effort	81,739	81,739	81,739	81,739
Project Management	108,480	108,480	108,480	108,480
Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.4 Will BC Hydro be required to incur additional radio off technology capital costs whenever there are upgrades or changes related to the smart grid applications that affect radio off integration?

RESPONSE:

Beyond upgrades and updates to applications considered in the 10 per cent allowance for IT Maintenance and Support, no further costs are anticipated.

Please also refer to the response to CEC IR 1.25.4.1.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
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IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.5 Please explain why or why not and provide a high level estimate of the costs that BC Hydro might expect to incur to maintain the integration in the face of changing smart grid IT.

RESPONSE:

Please refer to the response to CEC IR 1.27.4.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
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Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.6 How often might BC Hydro expect to have a change to the smart grid technology that affects the integration of radio off meters.

RESPONSE:

Please refer to the response to CEC IR 1.27.4.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
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Testing Effort	201,430	201,430	201,430	201,430
Integration Effort	81,739	81,739	81,739	81,739
Project Management	108,480	108,480	108,480	108,480
Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.7 Would BC Hydro agree that as legacy meters will be completely removed from service by 2021, the amortization period attributable to legacy meters could be considered as 7 rather than 10 years?

RESPONSE:

Not agreed.

27.0 Exhibit B-1, page 3-9 and page 3-16

Table 3-4 Radio-Off Information Technology Capital Costs

	Number of Meter Choices Customers			
($)	5,000	10,000	15,000	20,000
Business Analysis	224,829	224,829	224,829	224,829
SAP Changes	416,827	416,827	416,827	416,827
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Total Costs ($)	1,238,577	1,238,577	1,238,577	1,238,577

IT costs are common to both the radio-off and legacy meter options. As a result, costs are allocated to each option based on the ratio of customers assumed to choose a radio-off meter to customers assumed to retain their legacy meter. Cost recovery and Meter Choices Program charges are based on amortization of IT costs over a ten-year period, which is consistent with the amortization period for enterprise applications.

year 2014. The seals on all existing legacy meters will have expired by the end of calendar 2021. Due to the relatively low number of remaining legacy meters,

1.27.7.1 If not, please explain why not.

RESPONSE:

The amortization period for legacy meters will be unchanged and legacy meters will continue to be amortized until they are taken out of service. At which time any remaining book value will be written off as per normal practice.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.1 Please explain why the number of handhelds does not increase proportionally with the number of customers, such that there would be 18 units for 10,000 customers and 36 units required for 20,000 customers.

RESPONSE:

Please refer to the response to CEC IR 1.25.4.2.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.2 How many handheld units would BC Hydro require for 2,500 meter choices customers, and for 30,000, 40,000, 50,000 and 60,000 customers? Please extend the table accordingly.

RESPONSE:

At a participation level of 2,500 customers, it is estimated that seven handheld units would be required. Please also refer to the response to CEC IR 1.25.2.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	**52,236**	**81,256**	**98,668**	**116,080**

1.28.3 Would BC Hydro agree that damage to tablets and optical probes which are being used regularly in the field will occur from time to time.

RESPONSE:

Agreed.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.4 Please confirm that BC Hydro would likely maintain at least one spare handheld unit in the event that one or more is damaged or lost.

RESPONSE:

Confirmed.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.4.1 If no, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.28.4.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.4.2 If yes, please confirm that extra handheld unit(s)have been accounted for in the capital costs or provide the extra costs necessary to maintain an appropriate level of backup units for number of meter choices customers, including consideration for geographic dispersion of the units.

RESPONSE:

Spare units have not been included in the capital costs for the Meter Choices Program, since on an incremental basis no spare units will be required. Spare units are already on hand for the purposes of the non-WAN meter reads (i.e., those customers outside the range of backhaul communications).

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.5 What is the anticipated useful life for handheld units including consideration of technology changes and upgrades?

RESPONSE:

Please refer to the response to CEC IR 1.25.4.3.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.5.1 What was the amortization period BC Hydro employed for handheld units?

RESPONSE:

Schedule A-11 in Appendix I of the Application indicates an amortization period of three years.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.6 Please confirm or otherwise explain that BC Hydro will determine the number of handheld units required as of December 1, 2013 based on the number of customers who choose or who have deemed to have chosen to participate in the meter choices program.

RESPONSE:

Please refer to the response to CEC IR 1.25.3.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	**52,236**	**81,256**	**98,668**	**116,080**

1.28.7 Please provide BC Hydro's current best estimate of the number of handheld units it will require as of December 1, 2013.

RESPONSE:

The number required is uncertain as it depends on the number of Meter Choices Program customers and the meter reading resources required.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.8 Please confirm that the number of handheld units will account for geographic dispersion of meter choice customers.

RESPONSE:

Confirmed.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.9 Please confirm that to the extent that the number of meter reading customers declines over time, that the handheld units will not be needed.

RESPONSE:

If the number of Meter Choice Program customers declines such that fewer FMAs are required, fewer handheld units will be required.

28.0 Exhibit B-1, page 3-9 and 3-10

manually input into the same tablet computer. It is estimated that between nine and 20 handheld units will be required (one handheld unit for each FMA will be required).[18] The cost of each handheld unit, software, setup, and optical probe is

Table 3-5 Meter Data Download Handheld Unit Capital Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Number of Handhelds Required	9	14	17	20
Cost Per Handheld ($)	5,804	5,804	5,804	5,804
Total Cost ($)	52,236	81,256	98,668	116,080

1.28.10 Please explain how BC Hydro will handle the handheld units that would not be needed in the event of declining customer participation.

RESPONSE:

If fewer handheld units are required over time, where possible, these units will be repurposed (e.g., as spare units or replacements for units that remain in service as required).

29.0 Exhibit B-1, page 3-10

electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.

Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.1 What are BC Hydro's assumptions with respect to theft and grow ops as a percentage of customers retaining legacy meters? Please explain.

RESPONSE:

BC Hydro has not made any assumptions with regard to the number of legacy meter customers with grow-ops.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.1.1 Please provide the estimated number of grow ops and total theft with legacy meters totaling 2,500; 5,000; 10,000; 15,000; 20,000; 30,0000; 40,000; 50,000 and 60,000.

RESPONSE:

The sustained presence of legacy meters will increase the work required to conduct effective field inspection and analysis and provide assurance that theft and other revenue losses have been minimized. Field investigators will not be dedicated to investigating those customers who retain legacy meters.

Please refer to the response to Skogstad IR 1.2.1.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.2 Please confirm or otherwise explain that BC Hydro expects the proposed mitigation approach to fully compensate for any reduction to theft benefits that might accrue from the having remaining legacy meters in place.

RESPONSE:

It is not possible to determine whether the proposed mitigation approach using additional field investigators and check meters will fully mitigate the impact of a continuing presence of legacy meters in service.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.2.1 If not confirmed, please explain in what ways the theft detection benefits might be compromised by having legacy meters in place and provide quantification based on 2,500, 5000, 7,500 and 10,000, 15,000 and 20,000 legacy meters remaining.

RESPONSE:

Please refer to the response to CEC IR 1.29.2.

29.0 Exhibit B-1, page 3-10

electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.

Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.2.2 If BC Hydro does expect to fully mitigate the loss of theft detection benefits is there a threshold above which BC Hydro does not believe it could mitigate theft detection benefit losses?

RESPONSE:

Please refer to the response to CEC IR 1.29.2.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.3 Please confirm that theft detection becomes increasingly more difficult as the proportion of analogue meters increases.

RESPONSE:

Confirmed.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.3.1 If not confirmed, please explain why not.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.29.3.

29.0 Exhibit B-1, page 3-10

electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.

Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.3.2 If confirmed, please explain why the number of check meters decreases on a per customer basis as the number of analogue units increases.

RESPONSE:

The main driver of the volume of incremental check meters required is the number of sections of distribution feeders for which extra field inspections are necessitated due to a lack of complete energy inventory balance data. As the number of legacy meters increase, there will be feeder sections where multiple legacy meters are served by one or more check meters. For these feeder sections an additional legacy meter does not require an additional check meter.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.4 Please provide the estimated number of units required to maintain all the theft detection benefits assuming a 75%/25% split legacy meter to radio off meters for 2,500; 5,000; 10,000, 15,000; 20,000; 30,000; 40,0000; 50,000; and 60,000 customers participating in the Choices program.

RESPONSE:

Please refer to the responses to CEC IRs 1.25.2 and 1.29.2.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.5 Please confirm that BC Hydro has incorporated an allotment for damage and replacement units.

RESPONSE:

Not confirmed. BC Hydro has not incorporated a specific allotment for damage and replacement units.

29.0 Exhibit B-1, page 3-10

electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.

Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.5.1 If not confirmed, please provide BC Hydro's assessment of the number of replacement units that will be required over the life of the check meters.

RESPONSE:

Annual maintenance fees include a provision for an ongoing manufacturer's warranty. Units that become inoperable due to accidental damage would not be covered by warranty. BC Hydro has experienced a damage rate of less than 2 per cent with existing check meters.

29.0 Exhibit B-1, page 3-10

> electricity balance analysis to estimate the areas where theft is occurring. As a consequence, additional efforts are required to mitigate the impact to theft detection benefits. BC Hydro believes that the most cost effective mitigation approach is the deployment of additional field investigation teams. As part of the theft detection solution, these teams place temporary meters (check meters) near premises where theft is suspected to monitor electricity consumption. These check meters are $2,000 per unit, and it is anticipated that an additional 200 to 500 units will be required (corresponding to 2,500 to 10,000 customers choosing the legacy meter option, respectively). Assuming 5,000 customers choose the legacy meter option, it is estimated that 300 additional check meters will be required, for a total capital cost of $0.6 million.
>
> Check meters are assumed to have a five-year life, and amortization has been calculated accordingly. Since the deployment of check meters is necessitated by the

1.29.6 Please confirm that as the legacy meters are expected to remain in place beyond the five year service life, BC Hydro will need to replace check meters after 5 years.

RESPONSE:

Confirmed.

30.0 Exhibit B-1, page 3-11

18 Table 3-6 Range Extender Requirements

		One Range Extender Required Per X Meters Removed			
	Average Meter Density (meters/sq km)	Low	Med	High	Percent of BC Hydro Service Territory (%)
Metro/Dense	Greater than 2,000	NA	NA	NA	20.3
Urban	900 to 2,000	35	50	65	6.7
Suburban	60 to 900	21	30	39	56.4
Rural	2 to 60	6	8	10	9.9
Remote	Less than 2	1	2	3	5.6
Non-WAN		NA	NA	NA	1.0
Total					100.0

1.30.1 Is it BC Hydro's understanding that the geographic dispersion of customers who have refused smart meter service to date are dispersed in proportion to the percent of customers in BC Hydro service territory?

RESPONSE:

The response to BCUC IR 1.2.1 provides the distribution of refusal customers by billing area. With a number of exceptions, the distribution of refusal customers seems to be roughly aligned to the distribution by billing area of BC Hydro residential customers.

30.0 Exhibit B-1, page 3-11

18 Table 3-6 Range Extender Requirements

		One Range Extender Required Per X Meters Removed			
	Average Meter Density (meters/sq km)	Low	Med	High	Percent of BC Hydro Service Territory (%)
Metro/Dense	Greater than 2,000	NA	NA	NA	20.3
Urban	900 to 2,000	35	50	65	6.7
Suburban	60 to 900	21	30	39	56.4
Rural	2 to 60	6	8	10	9.9
Remote	Less than 2	1	2	3	5.6
Non-WAN		NA	NA	NA	1.0
Total					100.0

1.30.1.1 If not, please provide BC Hydro's estimates of how these customers are dispersed according to the average meter density.

RESPONSE:

Please refer to the responses to BCUC IR 1.2.1.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

Table 3-7 Telecom Infrastructure Capital Costs

	Number of Radio-Off Customers			
	5,000	10,000	15,000	20,000
Range Extenders Required Per X Meters Removed				
Low	436	870	1,303	1,738
Medium	305	609	913	1,215
High	236	469	702	936
Total Cost of Design, Installed Range Extenders and Ancillary Equipment ($)				
Low	1,538,208	3,069,360	4,596,984	6,131,664
Medium	**1,076,040**	**2,148,552**	**3,221,064**	**4,286,520**
High	832,608	1,654,632	2,476,656	3,302,208

1.31.1 Please confirm that 'Radio Off' refers to Program participants and includes legacy meter customers.

RESPONSE:

Confirmed. The table heading should have indicated "Number of Meter Choices Program Customers."

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.2 Please extend the above table to include 30,000, 40,000, 50,000 and 60,000 participants.

RESPONSE:

Please refer to the response to CEC IR 1.25.2.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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Medium	**1,076,040**	**2,148,552**	**3,221,064**	**4,286,520**
High	832,608	1,654,632	2,476,656	3,302,208

1.31.3 Please confirm that BC Hydro will be able to determine the optimal location of range extenders as of December 1, 2013.

RESPONSE:

Not confirmed.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.3.1 If not confirmed, when will BC Hydro be able to determine the optimal locations?

RESPONSE:

The optimal locations of telecom range extenders will be determined beginning after February 2014.

Please also refer to the response to CEC IR 1.25.3.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.4 Please confirm or otherwise explain that BC Hydro will determine the appropriate number of, and invest in range extenders based on the estimated number of meter choice customers as of December 1, 2013.

RESPONSE:

Not confirmed. Please refer to the responses to CEC IRs 1.25.3 and 1.31.3.1.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.5 Please confirm or otherwise explain that BC Hydro will have the range extenders in their capital costs based on the initial investment.

RESPONSE:

The question is unclear, and a response cannot therefore be provided.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.5.1 Please provide the historical frequency of customer moves within BC Hydro's service territory.

RESPONSE:

BC Hydro currently processes approximately 350,000 customer move-in move-outs per year in its service territory.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.6 Will BC Hydro need to change locations to the extent that customers drop out of the choices program or move?

RESPONSE:

There may be cases wherein a range extender will no longer be needed if one or more customers who initially chose to participate in the Meter Choices Program subsequently chose a smart meter. In these cases, BC Hydro may relocate the range extender, although this would depend on an assessment of the resulting impact on telecom network performance and the cost to move the range extender.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.6.1 If so, please confirm that BC Hydro has accounted for the costs of potential changes in the locations of range extenders based on changing commitments to the choices program and expected moves.

RESPONSE:

Not confirmed.

31.0 Exhibit B-1, Pages 3-12 and 3-13

The expected cost of one range extender (installed, with all ancillary equipment) is $3,028. In addition to the cost of additional range extenders, BC Hydro will incur costs associated with determining the optimal location of these range extenders once the location of radio-off and legacy meters is known (i.e., design engineering and site survey). The cost of this additional design engineering and site survey is estimated at $500 per range extender.

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High	832,608	1,654,632	2,476,656	3,302,208

1.31.6.2 If not confirmed, please provide BC Hydro's estimate of the cost of any changes that may be necessary given a changing and moving base of customers.

RESPONSE:

At a high level, this cost is not expected to be significant. If it is assumed that 20 per cent of Meter Choices Program customers move each year, incremental capital expenditures would be in the order of $430,000 per year (i.e., $2.15 million x 20 per cent). Since these assets have a weighted average life of 27 years, the impact on capital related costs would be in the order of $16,000 to $20,000 per year.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.1 Please provide a detailed list of activities that are undertaken to process a new customer account, such as reviewing credit history and customer communications and provide BC Hydro's estimate of the time allotted to each activity where available.

RESPONSE:

To process a new customer account, the following activities are undertaken. Note that the following list of activities does not include exception management.

- **Search records for customer**
- **Collect/verify customer information**
- **Assess customer's credit history**
- **Update/create customer record**
- **Perform credit check if required or discuss other alternatives for securing account**
- **Locate service address**
- **Validate premise type and rate category if needed**
- **Review service address history, confirm responsibility date of new tenant/owner**
- **Bill security deposit if required**
- **Establish billing**
- **Create or reinstate equal payment plan**
- **Create or reinstate pre authorized payment plan**
- **Create installment plan or other payment arrangements if needed**
- **Establish online profile for paperless billing if required**
- **Summarize new account details including billing, account number, charges etc**

Time is not specifically tracked for each activity in this process, however overall average handle time for the Move-In, Move-Out process (which is where new accounts are processed) over the last 12 months is 466 seconds per transaction.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.1.1 Please provide an estimate of the portion of the $12.40 account charge that may be attributed to customer communications.

RESPONSE:

The application for service process requires the collection of detailed customer information and therefore approximately 98 per cent of the account charge can be attributed to customer communications (whether information is provided verbally or electronically).

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.2 Would BC Hydro agree that the processes for new customers are well entrenched in the BC Hydro system and familiar to employees who are responsible for processing new customers, and to customers who are requesting service?

RESPONSE:

Yes. BC Hydro agrees that the process to establish new customers is familiar and well entrenched within BC Hydro systems and processes including those responsible for performing the function. BC Hydro cannot comment on familiarity to customers who are requesting service.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.2.1 If not, please explain why not.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.32.2.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.3 How many new customer accounts does BC Hydro process per year?

RESPONSE:

BC Hydro processes approximately 350,000 new accounts per year.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.4 Please provide a detailed list of activities that BC Hydro predicts will need to be undertaken to modify a customer account to allow for radio off or legacy meters including determination of eligibility, and customer communications and payment history.

RESPONSE:

The following tasks must be undertaken to update the customer's account:

- **For the initial enrolment:**
  - **Determine which customers are eligible for the Meter Choices Program – running list of customers with legacy meters and reviewing against eligible rate classes**
  - **Send letters to customers eligible for the Meter Choices Program explaining their options**
  - **Respond to questions for customers**
  - **Perform outbound calls to customers to elicit their response to enrolment**
  - **Send reminder letters about enrolment periods and the need to hear from a customer regarding their choice**
  - **Update customer contacts to indicate the form has been received, the date, and the customer choice.**
  - **Send a confirmation letter to the customer confirming their choice**

- **Update SAP to indicate the customer is a Meter Choices Program customer**
- **Update SAP to indicate either Legacy or Radio-off, with an effective date that the choice has been made**
- **If the customer has selected a radio-off meter, create a meter exchange work order to install a radio-off meter**

- **On an on-going basis, if a Meter Choices Program customer changes their enrolment (i.e., move from Legacy to Radio Off either at their current premise or through a move to a new premise), the agent will need to do the following activities :**
  - **Take customer calls**
  - **Review the current customer information to ensure the customer is enrolled in Meter Choices Program and their premises is flagged as either legacy or radio off.**
  - **If a customer moves, create a meter exchange work order**
  - **If a customer moves and wishes to enrol in radio off at their new premise, create a radio off work order**
  - **Maintain the proper customers premises record in SAP (both in old and new premises in the event of a move)**
  - **Apply one-time radio off installation fees when a radio off meter is installed or when a radio is turned off in a meter in the field**

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.5 Would BC Hydro agree that customer communication will be a key component of the new process to modify accounts to accommodate meter choice customers?

RESPONSE:

Agreed.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.5.1 If not, please explain why not with an estimate of the time BC Hydro has already spent communicating with individual customers related to opting out of service.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.32.5.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.6 Would BC Hydro agree that new processes will be required to determine eligibility for the meter choices program and that they will not be familiar either to staff or customers?

RESPONSE:

Agreed.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.6.1 If not, please explain why not.

RESPONSE:

Not applicable. Please refer the response to CEC IR 1.32.6.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.7 Would BC Hydro agree that those customers participating in the meter choice program may not be as accepting of the process and affiliated charges with the meter choice program as customers who are seeking new customer accounts?

RESPONSE:

Agreed.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.7.1 If not, please explain why not.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.32.7.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.8 Would BC Hydro agree that a premium for the customer communications aspect of the account charge would not be unreasonable for communications related to the meter choices account processing because dealing with meter choice customers are likely to be more complicated than dealing with a new account?

RESPONSE:

Not agreed.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.8.1 If not, please explain why not and provide a rationale as to why no premium would be necessary.

RESPONSE:

This cost is not intended to capture the costs associated with explaining the Meter Choices Program to customers as this is considered an SMI Program cost (i.e., deployment), since these conversations can result in a customer choosing either the installation of a smart meter or participation in the Meter Choices Program. The Account Charge is only intended to capture costs associated with enrolment in the program, which are not expected to be different from those for opening a new account.

32.0 Exhibit B-1, page 3-13

> The work effort required to modify a customer account to reflect either a radio-off or legacy meter is expected to be similar to that for a new customer account, and may include customer communications, reviewing the customer account and the determination of eligibility, and processing the account change through BC Hydro's IT systems. Accordingly, the Account Charge of $12.40 set out in the Schedule of Standard Charges in BC Hydro's Electric Tariff is viewed as an appropriate proxy for the determination of these charges. Customer processing costs are estimated to range from $62,000 to $248,000 as indicated in the following table.

1.32.9 Would BC Hydro agree that a premium for the other aspects of the processing costs might be appropriate given the newness of the process for staff and customers alike which may be expected to increase the costs relative to new account processing.

RESPONSE:

Based on experience to date the work effort associated with enrolling a customer in the Meter Choices Program is on average approximately the same as the work effort associated with new account processing.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.1 Please confirm that BC Hydro will need to communicate with and possibly undertake partial processing for customers who are either not eligible for the meter choices program or those customers who change their change their mind.

RESPONSE:

Yes, BC Hydro will need to respond to questions from customers that are not eligible for the Meter Choices Program, as well as customers who change their mind after initial enrolment. All customer contacts are recorded in the SAP system.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.2 Would BC Hydro agree that there is likely to be customer complaints related to the increase in analogue charges for those customers who 'Do Nothing' and receive a charge of $35 per month commencing in December 2013 or other reason related to the meter choice program.

RESPONSE:

Yes.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.2.1 If not, please explain why not.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.33.2.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.2.2 If so, please provide BC Hydro's estimate of the number of customer complaints it expects to receive from meter choice customers including those who receive service and then revert to smart meters.

RESPONSE:

Almost no complaints are expected from Meter Choices Program customers that have chosen their option and accepted the charges. The complaints are expected from customers who have not made a choice.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.3 What is the typical cost of resolving a customer complaint?

RESPONSE:

Since this service is outsourced to ABSBC, the average cost of resolving a customer complaint is not known to BC Hydro.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.4 What is the percentage labour and the percentage of non-labour that is embedded in the account processing cost?

RESPONSE:

Labour costs account for all of Customer Account Processing costs.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.5 Please confirm that the labour portion is based on standard labour costs.

RESPONSE:

Activities associated with Customer Account Processing will be performed by ABSBC employees under contract with ABSBC.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.6 If so, please provide the documentation for the standard labour cost with breakdown for the component costs.

RESPONSE:

Please refer to the response to CEC IR 1.33.5.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.6.1 If not confirmed, please provide BC Hydro's labour cost and the breakdown of components that are included in the labour portion of the processing cost.

RESPONSE:

Since these activities are undertaken by employees of ABSBC, the derivation of these costs, and their underlying components, is not known to BC Hydro.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.7 Please identify any supervisory or managerial costs that would be required to manage the staff necessary for processing the Meter choices customers.

RESPONSE:
Supervision and management is undertaken by ABSBC as part of the services contract. No incremental management and supervision costs are expected for managing these activities as a result of the projected volumes of Meter Choices Program participants.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.8 Please confirm that account processing would require a change in total staff accommodate substantial changes in the number of meter choices customers.

RESPONSE:

The $12.40 is a proxy for the cost per transaction. The number of staff required to perform the transactions is not relevant.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.9 Please confirm or otherwise explain that BC Hydro will determine the staffing necessary based on those customers who have chosen or who have been deemed to have chosen Meter choices program as of December 1, 2013.

RESPONSE:

Please refer to the response to CEC IR 1.33.8.

33.0 Exhibit B-1, page 3-14 Table 3-8

Table 3-8 Meter Choices Account Processing Operating Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Radio-Off Option Account Processing Cost Per Customer ($)	12.40	12.40	12.40	12.40
Total Cost ($)	62,000	124,000	186,000	248,000

1.33.10 Please explain how BC Hydro will adjust the staffing levels based on declining participation in the meter choice program.

RESPONSE:

Please refer to the response to CEC IR 1.33.8.

34.0 Exhibit B-1, page 3-14

> ***3.4.2.2 Radio-Off Meter Deployment***
>
> The firmware update required to deactivate the radio will be performed by a Meter and Instrument Technician, and the BC Hydro standard labour rate for this resource, which includes benefits, is currently $64.59 per hour. The cost to download the firmware and deactivate the field area network radio is therefore $26.91 per unit (i.e., 25 minutes ÷ 60 minutes × $64.59 per hour).

1.34.1 Will the firmware update be conducted in the field or in BC Hydro offices prior to deployment?

RESPONSE:

It is expected that the firmware update will be undertaken at the BC Hydro meter shop.

34.0 Exhibit B-1, page 3-14

> ***3.4.2.2 Radio-Off Meter Deployment***
>
> The firmware update required to deactivate the radio will be performed by a Meter and Instrument Technician, and the BC Hydro standard labour rate for this resource, which includes benefits, is currently $64.59 per hour. The cost to download the firmware and deactivate the field area network radio is therefore $26.91 per unit (i.e., 25 minutes ÷ 60 minutes × $64.59 per hour).

1.34.1.1 If conducted in the field, please confirm that BC Hydro has allocated travel time, vehicle costs and travel costs to the cost for deactivating the radio and provide an estimate of these costs.

RESPONSE:

Please refer to the response to CEC IR 1.34.1.

34.0 Exhibit B-1, page 3-14

3.4.2.2 *Radio-Off Meter Deployment*

The firmware update required to deactivate the radio will be performed by a Meter and Instrument Technician, and the BC Hydro standard labour rate for this resource, which includes benefits, is currently $64.59 per hour. The cost to download the firmware and deactivate the field area network radio is therefore $26.91 per unit (i.e., 25 minutes ÷ 60 minutes × $64.59 per hour).

1.34.1.1.1 If not confirmed, please calculate an estimate of the vehicle costs, travel costs and travel time that would accrue to this activity, including time spent refueling, and BC Hydro's estimate of time spent driving between non-contiguous locations.

RESPONSE:

Please refer to the response to CEC IR 1.5.2.

34.0 Exhibit B-1, page 3-14

3 ***3.4.2.2 Radio-Off Meter Deployment***

18 The firmware update required to deactivate the radio will be performed by a Meter
19 and Instrument Technician, and the BC Hydro standard labour rate for this resource,
20 which includes benefits, is currently $64.59 per hour. The cost to download the
21 firmware and deactivate the field area network radio is therefore $26.91 per unit (i.e.,
22 25 minutes ÷ 60 minutes × $64.59 per hour).

1.34.2 Please provide documentation of the standard labour rate including the breakdown of cost components.

RESPONSE:

Please refer to the response to BCUC IR 1.13.2.

34.0 Exhibit B-1, page 3-14

3.4.2.2 *Radio-Off Meter Deployment*

The firmware update required to deactivate the radio will be performed by a Meter and Instrument Technician, and the BC Hydro standard labour rate for this resource, which includes benefits, is currently $64.59 per hour. The cost to download the firmware and deactivate the field area network radio is therefore $26.91 per unit (i.e., 25 minutes ÷ 60 minutes × $64.59 per hour).

1.34.2.1 To the extent that they are not included in the documentation, please provide BC Hydro's breakdown of the component costs.

RESPONSE:

Please refer to the response to BCUC IR 1.13.2.

35.0 Exhibit B-1, page 3-15

> ***3.4.2.3 Training and Transition to Operations***
>
> It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.1 Would BC Hydro expect that the $48,000 would increase if the number of meter choices customers is in the order of 60,000?

RESPONSE:

It is likely that training and transition costs would increase if 60,000 customers chose to participate in the Meter Choices Program. However, BC Hydro does not believe that participation in the program will be 60,000.

35.0 Exhibit B-1, page 3-15

12 ***3.4.2.3 Training and Transition to Operations***

13 It is estimated that costs for training and transition to operations will be in the order
14 of $48,500. Related activities include training for call centre agents to handle
15 customer inquiries and enrolment, as well as process design and development for
16 enrolment, move-in/move-out, and other sustainment processes.

17 **Table 3-10 Training and Transition to Operations**
18 **Costs**

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.1.1 Please explain why or why not.

RESPONSE:

Additional call centre staff would likely be required, increasing training costs as a result of increased payroll costs during the training period (i.e., call centre personnel are paid during training).

35.0 Exhibit B-1, page 3-15

> ***3.4.2.3 Training and Transition to Operations***
>
> It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.2 What is the proportion of labour and non-labour that is included in the training and transition to operations.

RESPONSE:

Labour costs account for all training and transition costs.

35.0 Exhibit B-1, page 3-15

> ***3.4.2.3 Training and Transition to Operations***
>
> It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.3 Please confirm that the labour component is based on standard labour costs.

RESPONSE:

Not confirmed.

35.0 Exhibit B-1, page 3-15

3.4.2.3 Training and Transition to Operations

It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.3.1 If confirmed, please provide the appropriate documentation of the standard labour cost with breakdown of the component costs that are included.

RESPONSE:

Please refer to the response to CEC IR 1.35.3.

35.0 Exhibit B-1, page 3-15

> ***3.4.2.3 Training and Transition to Operations***
>
> It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.
>
> **Table 3-10 Training and Transition to Operations Costs**

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.3.2 To the extent that the component costs are not broken down, please provide BC Hydro's estimate of the component costs.

RESPONSE:

Call centre personnel and training resources are provided to BC Hydro under contract with ABSBC. As a result, BC Hydro does not know these component costs.

35.0 Exhibit B-1, page 3-15

12 ***3.4.2.3 Training and Transition to Operations***

13 It is estimated that costs for training and transition to operations will be in the order
14 of $48,500. Related activities include training for call centre agents to handle
15 customer inquiries and enrolment, as well as process design and development for
16 enrolment, move-in/move-out, and other sustainment processes.

17 **Table 3-10 Training and Transition to Operations**
18 **Costs**

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.3.3 If not confirmed, please provide BC Hydro's labour costs with a breakdown of the component costs.

RESPONSE:

Please refer to the response to CEC IR 1.35.3.2.

35.0 Exhibit B-1, page 3-15

> ***3.4.2.3 Training and Transition to Operations***
>
> It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.4 What is included in the non-labour portion of Training and Transition to Operations?

RESPONSE:

Please refer to the response to CEC IR 1.35.2.

35.0 Exhibit B-1, page 3-15

12 ***3.4.2.3 Training and Transition to Operations***

13 It is estimated that costs for training and transition to operations will be in the order
14 of $48,500. Related activities include training for call centre agents to handle
15 customer inquiries and enrolment, as well as process design and development for
16 enrolment, move-in/move-out, and other sustainment processes.

17 **Table 3-10 Training and Transition to Operations**
18 **Costs**

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.5 Please confirm that the Training and Transition to Operations will likely require call centre agents to handle a large volume of calls related to the meter choices program from those customers who change their minds and do not participate in the meter choices program.

RESPONSE:

Not confirmed. Training and transition costs do not include costs associated with actual call handling by call centre agents.

35.0 Exhibit B-1, page 3-15

3.4.2.3 Training and Transition to Operations

It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.5.1 Please confirm or otherwise explain that BC Hydro has accounted for these calls in its estimate of Total Costs.

RESPONSE:

Please refer to the response to CEC IR 1.35.5.

35.0 Exhibit B-1, page 3-15

12 ***3.4.2.3 Training and Transition to Operations***

13 It is estimated that costs for training and transition to operations will be in the order
14 of $48,500. Related activities include training for call centre agents to handle
15 customer inquiries and enrolment, as well as process design and development for
16 enrolment, move-in/move-out, and other sustainment processes.

17 **Table 3-10 Training and Transition to Operations**
18 **Costs**

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.5.2 If not, please provide an estimate of the additional expense that will be required to handle calls related to the meter choice program that do not result in a long term meter choice customer.

RESPONSE:

Please refer to the response to CEC IR 1.35.5.

35.0 Exhibit B-1, page 3-15

> ***3.4.2.3 Training and Transition to Operations***
>
> It is estimated that costs for training and transition to operations will be in the order of $48,500. Related activities include training for call centre agents to handle customer inquiries and enrolment, as well as process design and development for enrolment, move-in/move-out, and other sustainment processes.

Table 3-10 Training and Transition to Operations Costs

	Number of Meter Choices Customers			
	5,000	10,000	15,000	20,000
Training and Transition to Operations Per Customer ($)	9.70	4.85	3.23	2.42
Total Cost ($)	**48,480**	**48,480**	**48,480**	**48,480**

1.35.6 Please confirm that BC Hydro has already or will undertake to staff and prepare for Training and Transition based on the number of customers who have chosen or are deemed to have chosen to participate in the Meter choices program as of December 1, 2013.

RESPONSE:

Please refer to the response to CEC IR 1.35.5.

36.0 Exhibit B-1, page 3-16

> ***3.4.2.4 IT Support and Maintenance***
>
> Annual IT maintenance and support is estimated at 10 per cent of IT capital (including handheld devices), and includes costs related to hardware and software maintenance, periodic maintenance and troubleshooting, management, etc. IT maintenance is estimated about $0.12 million per year.

1.36.1 Please confirm that labour costs associated with IT and support maintenance are the standard labour costs.

RESPONSE:

Not confirmed.

36.0 Exhibit B-1, page 3-16

> ***3.4.2.4 IT Support and Maintenance***
>
> Annual IT maintenance and support is estimated at 10 per cent of IT capital (including handheld devices), and includes costs related to hardware and software maintenance, periodic maintenance and troubleshooting, management, etc. IT maintenance is estimated about $0.12 million per year.

1.36.2 If not confirmed, please provide the standard labour costs for each position.

RESPONSE:

Please refer to the response to BCPSO IR 1.17.1.

36.0 Exhibit B-1, page 3-16

> ***3.4.2.4 IT Support and Maintenance***
>
> Annual IT maintenance and support is estimated at 10 per cent of IT capital (including handheld devices), and includes costs related to hardware and software maintenance, periodic maintenance and troubleshooting, management, etc. IT maintenance is estimated about $0.12 million per year.

1.36.3 Please provide the documentation of the standard labour costs detailing the breakdown of the component costs for each positions.

RESPONSE:

Please refer to the response to BCPSO IR 1.17.1.

36.0 Exhibit B-1, page 3-16

> ***3.4.2.4 IT Support and Maintenance***
>
> Annual IT maintenance and support is estimated at 10 per cent of IT capital (including handheld devices), and includes costs related to hardware and software maintenance, periodic maintenance and troubleshooting, management, etc. IT maintenance is estimated about $0.12 million per year.

1.36.4 To the extent that the documentation does not breakdown the component costs, please supply BC Hydro's breakdown of the component costs of each labour position.

RESPONSE:

Please refer to the response to BCPSO IR 1.17.1.

36.0 Exhibit B-1, page 3-16

> ***3.4.2.4 IT Support and Maintenance***
>
> Annual IT maintenance and support is estimated at 10 per cent of IT capital (including handheld devices), and includes costs related to hardware and software maintenance, periodic maintenance and troubleshooting, management, etc. IT maintenance is estimated about $0.12 million per year.

1.36.5 Please quantify the supervisory labour and management staff that is required to manage the additional labour.

RESPONSE:

No incremental supervisory labour and management is anticipated beyond that which may already be included in the contractor hourly rates.

37.0 Exhibit B-1, page 3-17 and 3-18

Based on a per unit meter exchange cost of $55, the cost of meter exchanges due to expired Measurement Canada seals is estimated as follows:

Table 3-11 Legacy Meter Exchange Costs

Year	Percent Seal Expiry (%)	Cost Per Exchange ($)	Meter Exchanges			
			2,500 Legacy Meter Customers	5,000 Legacy Meter Customers	7,500 Legacy Meter Customers	10,000 Legacy Meter Customers
2014	53.5	$ 55	1,338	2,677	4,015	5,354
2015	7.7	56	191	383	574	765
2016	12.0	57	301	602	903	0
2017	1.7	58	43	87	0	0
2018	18.0	60	449	531	0	0
2019	2.7	61	0	0	0	0
2020	3.2	62	0	0	0	0
2021	1.1	63	0	0	0	0
Total Exchanges	100.0		2,322	4,280	5,492	6,119
Total Cost ($)			130,877	239,903	304,440	337,310
Average Annual Cost ($)			16,360	47,981	76,110	84,328

To maintain rate stability, it is proposed that cost recovery for expired meter seal exchanges in each year be aligned to the average over the period to 2021 (i.e., the latest year of meter seal expiry).

1.37.1 Please confirm or otherwise explain that legacy meters should be eliminated completely from BC Hydro service territory by 2021.

RESPONSE:

Confirmed. The last Measurement Canada seal expiry occurs in 2021.

37.0 Exhibit B-1, page 3-17 and 3-18

Based on a per unit meter exchange cost of $55, the cost of meter exchanges due to expired Measurement Canada seals is estimated as follows:

Table 3-11 Legacy Meter Exchange Costs

Year	Percent Seal Expiry (%)	Cost Per Exchange ($)	Meter Exchanges			
			2,500 Legacy Meter Customers	5,000 Legacy Meter Customers	7,500 Legacy Meter Customers	10,000 Legacy Meter Customers
2014	53.5	$ 55	1,338	2,677	4,015	5,354
2015	7.7	56	191	383	574	765
2016	12.0	57	301	602	903	0
2017	1.7	58	43	87	0	0
2018	18.0	60	449	531	0	0
2019	2.7	61	0	0	0	0
2020	3.2	62	0	0	0	0
2021	1.1	63	0	0	0	0
Total Exchanges	100.0		2,322	4,280	5,492	6,119
Total Cost ($)			130,877	239,903	304,440	337,310
Average Annual Cost ($)			16,360	47,981	76,110	84,328

To maintain rate stability, it is proposed that cost recovery for expired meter seal exchanges in each year be aligned to the average over the period to 2021 (i.e., the latest year of meter seal expiry).

1.37.2 Please confirm that BC Hydro has communicated the expected termination date of available legacy meters to potential meter choice customers.

RESPONSE:

Not confirmed. Please refer to the response to BCPSO IR 1.8.3.

37.0 Exhibit B-1, page 3-17 and 3-18

Based on a per unit meter exchange cost of $55, the cost of meter exchanges due to expired Measurement Canada seals is estimated as follows:

Table 3-11 Legacy Meter Exchange Costs

Year	Percent Seal Expiry (%)	Cost Per Exchange ($)	Meter Exchanges			
			2,500 Legacy Meter Customers	5,000 Legacy Meter Customers	7,500 Legacy Meter Customers	10,000 Legacy Meter Customers
2014	53.5	$ 55	1,338	2,677	4,015	5,354
2015	7.7	56	191	383	574	765
2016	12.0	57	301	602	903	0
2017	1.7	58	43	87	0	0
2018	18.0	60	449	531	0	0
2019	2.7	61	0	0	0	0
2020	3.2	62	0	0	0	0
2021	1.1	63	0	0	0	0
Total Exchanges	100.0		2,322	4,280	5,492	6,119
Total Cost ($)			130,877	239,903	304,440	337,310
Average Annual Cost ($)			16,360	47,981	76,110	84,328

To maintain rate stability, it is proposed that cost recovery for expired meter seal exchanges in each year be aligned to the average over the period to 2021 (i.e., the latest year of meter seal expiry).

1.37.3 Please confirm that the cost of maintaining legacy meter inventory including physical space, maintenance and management and insurance has been incorporated into the costs of the meter choice program.

RESPONSE:

Not confirmed.

37.0 Exhibit B-1, page 3-17 and 3-18

Based on a per unit meter exchange cost of $55, the cost of meter exchanges due to expired Measurement Canada seals is estimated as follows:

Table 3-11 Legacy Meter Exchange Costs

Year	Percent Seal Expiry (%)	Cost Per Exchange ($)	Meter Exchanges			
			2,500 Legacy Meter Customers	5,000 Legacy Meter Customers	7,500 Legacy Meter Customers	10,000 Legacy Meter Customers
2014	53.5	$ 55	1,338	2,677	4,015	5,354
2015	7.7	56	191	383	574	765
2016	12.0	57	301	602	903	0
2017	1.7	58	43	87	0	0
2018	18.0	60	449	531	0	0
2019	2.7	61	0	0	0	0
2020	3.2	62	0	0	0	0
2021	1.1	63	0	0	0	0
Total Exchanges	100.0		2,322	4,280	5,492	6,119
Total Cost ($)			130,877	239,903	304,440	337,310
Average Annual Cost ($)			16,360	47,981	76,110	84,328

To maintain rate stability, it is proposed that cost recovery for expired meter seal exchanges in each year be aligned to the average over the period to 2021 (i.e., the latest year of meter seal expiry).

1.37.3.1 If so, please identify where the costs have been incorporated into the program.

RESPONSE:

Please refer to the response to CEC IR 1.37.3.

37.0 Exhibit B-1, page 3-17 and 3-18

Based on a per unit meter exchange cost of $55, the cost of meter exchanges due to expired Measurement Canada seals is estimated as follows:

Table 3-11 Legacy Meter Exchange Costs

Year	Percent Seal Expiry (%)	Cost Per Exchange ($)	Meter Exchanges			
			2,500 Legacy Meter Customers	5,000 Legacy Meter Customers	7,500 Legacy Meter Customers	10,000 Legacy Meter Customers
2014	53.5	$ 55	1,338	2,677	4,015	5,354
2015	7.7	56	191	383	574	765
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2017	1.7	58	43	87	0	0
2018	18.0	60	449	531	0	0
2019	2.7	61	0	0	0	0
2020	3.2	62	0	0	0	0
2021	1.1	63	0	0	0	0
Total Exchanges	100.0		2,322	4,280	5,492	6,119
Total Cost ($)			130,877	239,903	304,440	337,310
Average Annual Cost ($)			16,360	47,981	76,110	84,328

To maintain rate stability, it is proposed that cost recovery for expired meter seal exchanges in each year be aligned to the average over the period to 2021 (i.e., the latest year of meter seal expiry).

1.37.3.2 If not, please provide an estimated cost of the maintaining an inventory of legacy meters for 7 years.

RESPONSE:

BC Hydro does not have this estimate although these costs are not expected to be significant and no incremental resources or budget is anticipated.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.1 Please confirm that labour costs associated with field investigators, meter technicians, electrical contractors and analysts are the standard labour costs.

RESPONSE:

Confirmed, with the exception of Electrical Contractors which is a contractor cost based on the number of contractors needed and the cost per contractor (including vehicle costs). BC Hydro does not have the underlying components of the contractor costs.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.2 If not confirmed, please provide the standard labour costs for each of these positions.

RESPONSE:

Please refer to the response to CEC IR 1.38.1.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.3 Please provide the documentation of the standard labour costs detailing the breakdown of the component costs for each of these positions.

RESPONSE:

Field Investigators are a P3 job grade level, and analysts are a P2. A separate and distinct job level applies to Power Line Technicians (PLTs). The components of the standard labour rates are as follows:

$ per hour	P2	P3	PLT
Base Pay	**39.54**	**49.38**	**41.05**
Premium Time	**1.72**	**2.45**	**9.33**
Gain Sharing	**1.96**	**3.05**	**1.80**
Concession Time	**9.35**	**11.68**	**10.26**
Vacation Differential	**0.09**	**0.12**	**2.70**
Benefits & Current Portion of Pension	**16.21**	**20.12**	**16.96**
Total	**68.87**	**86.80**	**82.10**

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.4 To the extent that the documentation does not breakdown the component costs, please supply BC Hydro's breakdown of the component costs of each labour position.

RESPONSE:

Please refer to the response to CEC IR 1.38.3.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.5 Please quantify the supervisory labour and management staff that is required to manage the additional theft detection labour.

RESPONSE:

No incremental supervisory and management staff will be required to manage the incremental field investigation resources.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.6 How much of the above labour requirements reflect time required to integrate the investigation results with fire and safety professionals, police and customer service and other pre or post investigation activities?

RESPONSE:

BC Hydro's field inspections are not integrated with the above mentioned groups. In cases where field inspections confirm large scale thefts of electricity, a criminal complaint may be filed with law enforcement. Appropriate steps are always taken to remedy any electrical safety concerns and recover funds from those responsible. These costs are not separately identifiable in respect of the incremental field inspection resources but represent a relatively small portion of the work.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.7 How much of the field investigator's time is spent in the field vs. in BC Hydro offices?

RESPONSE:

Over 80 per cent of field investigator's time is spent in the field.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.8 How much of the meter technician's time is spent in the field vs. BC Hydro offices?

RESPONSE:

Over 80 per cent of the time of the meter technician working on revenue assurance field investigations will be spent in the field.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.9 What training costs are associated with field investigators, meter technicians, and analyst positions respectively.

RESPONSE:

Labour costs associated with attending training are included within standard labour rates. Other training is delivered on-line, in group settings, or on the job by managers and co-workers. As such, there are no incremental training costs included within the cost estimate.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
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Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.9.1 Please provide estimated annual training costs and indicate if these costs are included in the labour costs.

RESPONSE:

Please refer to the response to CEC IR 1.38.9.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.10 Please extend the above table to include the customer numbers of 15,000; 20,000; 30,000; 40,000; 50,000 and 60,000.

RESPONSE:

Please refer to the response to CEC IR 1.25.2.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.11 Please confirm or otherwise explain that BC Hydro will determine the total number of field investigators, meter technicians and analysts that are required based on the number of customers who choose or who are deemed to have chosen legacy meters as of December 1, 2013.

RESPONSE:

BC Hydro has provided additional information on the number of planned field investigation resources to the BCUC on a confidential basis (BCUC IR 1.18.1). BC Hydro believes that it is not appropriate to disclose the information publicly.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.12 Would BC Hydro agree that there could be a large number of customers deemed to be legacy meters customers on December 1, 2013?

RESPONSE:

BC Hydro expects that the number of legacy meter customers will decline in the months following December 1, 2013. Please also refer to the response to BCUC IR 1.6.5.1.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.12.1 If not, please explain why not.

RESPONSE:

Please refer to the response to CEC IR 1.38.12.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.13 Please confirm or otherwise explain that there will be a lag in the reduction of the theft detection resources to the extent that customers who choose or who are deemed to have chosen legacy meters declines from December 1, 2013 over a period of time.

RESPONSE:

Confirmed. Field inspection requirements will decline gradually as complete interval consumption data becomes available for sections of the distribution grid.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.14 Please explain how BC Hydro intends to deal with a declining requirement for theft reduction capabilities and for how long BC Hydro would maintain these resources following reduction of legacy meter customers.

RESPONSE:

BC Hydro will partially mitigate the risk of stranded costs by utilizing full-time temporary employees and contractors for these incremental positions. However, the capital costs of check meters would not be avoided. For security reasons, an estimate of how long these incremental resources will be maintained cannot be provided at this time.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.15 Please provide BC Hydro's assumptions with respect the number of grow ops that are expected to occur under a situation in which there are 2,500; 5,000; 10,000; 15,000, 20,000; 30,000, 40,000, 50,000 and 60,000 legacy meters installed.

RESPONSE:

Please refer to the response to CEC IR 1.29.1.1.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.16 Please provide BC Hydro's assumptions with respect to the proportion of grow ops that would occur under full deployment of smart meters.

RESPONSE:

BC Hydro's mandate is to reduce theft of electricity and the safety and financial risks that accompany theft of electricity. BC Hydro's Smart Metering Program business case anticipates that theft of electricity, including from grow-ops, will be reduced significantly but does not assume that the total number of grow-ops in the province will change.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.17 Would BC Hydro agree that grow ops are more likely to occur in a population requesting legacy meters than they would in the general population.

RESPONSE:

Please refer to the response to Skogstad IR 1.2.1.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.17.1 Please explain why or why not.

RESPONSE:

Please refer to the response to Skogstad IR 1.2.1.

38.0 Exhibit B-1, page 3-19

Table 3-12 Additional Theft Detection Resources Required

	Level of Legacy Meter Participation			
	2,500	5,000	7,500	10,000
Number of Field Investigators	2.00	2.00	3.00	4.00
Number of Meter Technicians	1.00	1.00	1.00	1.00
Number of Electrical Contractors	1.00	1.00	2.00	3.00
Analysts Required	1.00	1.00	2.00	2.00
Field Investigator ($)	271,858	271,858	407,786	543,715
Meter Technician (PLT) ($)	128,569	128,569	128,569	128,569
Electrical Contractors ($)	195,000	195,000	390,000	585,000
Analysts ($)	107,850	107,850	215,701	215,701
Sub-Total ($)	**703,277**	**703,277**	**1,142,056**	**1,472,985**
Travel and Expenses ($)	23,000	23,000	31,500	38,750
Check Meter Maintenance ($)	60,000	90,000	120,000	150,000
Total Annual Costs ($)	**786,277**	**816,277**	**1,293,556**	**1,661,735**

Total costs for incremental field investigation, assuming that 5,000 customers choose the legacy meter option, are estimated at about $816,000 per year, inclusive of travel and expenses.

1.38.18 Please provide BC Hydro's assumptions with respect to the proportion of grow ops that are expected in the main customer base.

RESPONSE:

Publicly available estimates suggest that there are 10,000 to 25,000 grow-ops within the province.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.1 Please explain whether or not there may be additional meter reading visits undertaken based on customer requests or concerns, customer moves, meter reading errors or other unanticipated events.

RESPONSE:

Yes, additional meter visits may be required for all meter options, including meter investigations, such as but not limited to, failed meter data capture, manual reading errors, switched meters, zero consumption, dormant accounts, queried rates and reads, and service location discrepancies.

BC Hydro generally does not read meters at the time of customer moves.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
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Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.1.1 If so, please provide an estimate of the number of additional reads that may be required for meter choice customers.

RESPONSE:

BC Hydro has no reason to expect additional reads, beyond those identified in the table, will be required for legacy and radio-off meters as compared to for smart meter. Please refer to the response to CEC IR 1.39.1.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
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Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.2 Please explain if the meter reading conducted under contract is based on a 'per read' cost or on a fixed price and/or term which is dependent on BC Hydro accurately estimating the number of meter reads required.

RESPONSE:

Meter reading costs are based on the number of Field Meter Analysts required to complete the reads.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.3 Please confirm that the meter reading costs associated with the FMA are based on standard labour costs.

RESPONSE:

The cost per FMA is specified in the contract with ABSBC at a rate included in that contract.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this

agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.3.1 If not confirmed, please provide the standard labour costs associated with the FMA positions.

RESPONSE:

The costs per FMA are identified in Schedule A-8 in Appendix I of the Application.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.3.2 Please provide documentation for the standard FMA labour costs including the breakdown of component costs.

RESPONSE:

Since FMAs are ABSBC employees, the composition of the rate for an FMA is not known to BC Hydro.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this

agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.3.3 To the extent that the documentation does not provide the breakdown of the component costs of the FMA position, please provide BC Hydro's breakdown.

RESPONSE:

Please refer to the response to CEC IR 1.39.3.2.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.3.4 Please identify and quantify the supervisory and/or management costs that are associated with managing the contract for meter reading and maintaining the vehicle fleet.

RESPONSE:

Supervision and management of meter reading is undertaken by ABSBC as part of the services contract. No incremental management and supervision costs are expected for managing the contract for meter reading nor for managing the incremental fleet vehicles used by FMAs.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this

agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.4 Please identify and quantify any FMA time that for which BC Hydro pays that is not spent 'meter reading'.

RESPONSE:

In addition to meter reading, FMAs undertake a number of associated activities. These include:

- **Perform meter investigations, such as, failed meter data capture, manual reading errors, switched meters, zero consumption, dormant accounts, queried rates and reads, and service location discrepancies**
- **Perform miscellaneous field work, including visual inspections, meter interrogations, demand reset exceptions, remote disconnect/reconnect exceptions, uploads firmware, and meter data capture**
- **Schedule and perform disconnection and reconnection of smart meters in accordance with BC Hydro Policy and Procedure**
- **Schedule and perform manual disconnection of single phase legacy meters**

In addition, there is time such as travel time, meeting time and reporting that FMAs must undertake in conjunction with the above duties.

This time is not recorded separately by FMAs so quantification is not possible.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.5 Please identify and quantify any manual meter reading costs that are not captured in the above analysis such as training.

RESPONSE:

Costs for activities other than meter reading, including training costs, are not expected to be significant.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.6 Please extend the above table to include 30,000, 40,000, 50,000 and 60,000 meter choice customers.

RESPONSE:

Please refer to the response to CEC IR 1.25.2.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this

agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.7 Please confirm or otherwise explain that BC Hydro will contract for meter reading services based on the number of customers who choose or who are deemed to have chosen to participate in the meter choice program as of December 1, 2013.

RESPONSE:

BC Hydro has entered into a contract arrangement with Accenture Business Services of B.C. (ABSBC) to provide field customer services which includes meter reading and associated services. The arrangement allows for the addition or reduction of staff based upon requirements. Customers who choose or who are deemed to have chosen to participate in the Meter Choices Program will constitute part of the customer base that requires manual meter reading. Those with smart meters that are not communicating on the smart meter network are the other group of customers that requires manual meter reading. Other activities such as manual disconnections/reconnections and investigation orders on meters may occur on any meter (including those who chose or are deemed to have chosen to participate in the Meter Choices Program). The number of customers who participate in the Meter Choices Program will be a primary factor in determining the level of staffing required under this contract arrangement on an ongoing basis.

39.0 Exhibit B-1, page 3-19, page 3-20 and 3-22

Radio-off and legacy meters will be read by a contractor under an agreement to provide field customer services. In April 2013, and under the terms of this

agreement, about 100,000 meter reads were performed by 76.1 FMA FTEs.[21] This level of productivity serves as the starting point in the analysis. Since downloading

Table 3-13 Meter Choices Manual Meter Download/Read Operating Costs

	Number of Meter Choice Customers			
Radio-Off	**2,500**	**5,000**	**7,500**	**10,000**
Legacy Meter	**2,500**	**5,000**	**7,500**	**10,000**
Total	**5,000**	**10,000**	**15,000**	**20,000**
Radio Off Meter Reads				
Cost Per Read ($)	39.23	28.05	22.52	19.77
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	41.85	30.08	24.19	21.25
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	627,750	902,400	1,088,550	1,275,000
Legacy Meter Reads				
Cost Per Read ($)	36.98	25.87	20.45	17.73
Vehicle Operating Costs ($)	1.98	1.49	1.21	1.07
Travel Costs ($)	0.64	0.54	0.46	0.41
Total Meter Reading Cost ($)	39.60	27.90	22.12	19.21
Number of Reads Per Year	15,000	30,000	45,000	60,000
Total Manual Read Cost Per Year ($)	594,000	837,000	995,400	1,152,600
Total Manual Meter Reading Costs ($)	**1,221,750**	**1,739,400**	**2,083,950**	**2,427,600**

1.39.8 Please explain how BC Hydro will manage the meter reading contract based on declining participation over time, and if BC Hydro would be require a meter read at the time a customer is converted to a smart meter radio on from a legacy meter.

RESPONSE:

BC Hydro has entered into a contract arrangement with ABSBC to provide field customer services, which includes meter reading for meters that will still require manual reads. The contract contains an ability to increase or reduce ABSBC staffing levels to reflect requirements. As participation in a Meter Choices option that requires manual meter reading declines, BC Hydro will be able to request that ABSBC reduces staffing levels accordingly.

When a customer is converted from a legacy meter to a smart meter radio on, consumption on the legacy meter is recorded as part of the process of removing the legacy meter and installing the new smart meter. Smart meter installations are not part of the scope of the ABSBC field customer services contract.

40.0 Exhibit B-1, page 3-20

> Choices Program. The final adjustment is intended to capture meter reading productivity gains once the number and location of Meter Choices customers and non-WAN customers (i.e., those customers outside the range of backhaul communications) have a reached a "steady state." Currently, meter routes are

1.40.1 When does BC Hydro expect the number and location of Meter Choices customers to reach a 'steady state'?

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.1.

40.0 Exhibit B-1, page 3-20

Choices Program. The final adjustment is intended to capture meter reading productivity gains once the number and location of Meter Choices customers and non-WAN customers (i.e., those customers outside the range of backhaul communications) have a reached a "steady state." Currently, meter routes are

1.40.1.1 Please provide a discussion of BC Hydro's expectations with respect to the changing numbers of meter choices customers and provide any sensitivity analysis that BC Hydro has conducted.

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.1. No related sensitivity analysis has been undertaken.

41.0 Exhibit B-1, page 3-21

not expected to change materially. Currently, these costs are about $120,000 per year, and a decrease to $100,000 per year is assumed. These costs have been allocated on a weighted basis to both non-WAN customers and customers choosing to participate in the Meter Choices Program. Accordingly, travel costs are estimated at about $0.64 per read (based on 5,000 Meter Choices customers) to about $0.41 per read (based on 20,000 Meter Choices customers).

1.41.1 Please explain why a reduction of $20,000 in travel expenses to $100,000 has been assumed.

RESPONSE:

It is expected that a decrease in in the number of accounts requiring manual reads will result in a decrease in the number of accounts that require ferries, lodging, or meals. Accordingly, the total cost has been reduced by $20,000.

Please also refer to the response to BCUC IR 1.19.4.

41.0 Exhibit B-1, page 3-21

not expected to change materially. Currently, these costs are about $120,000 per year, and a decrease to $100,000 per year is assumed. These costs have been allocated on a weighted basis to both non-WAN customers and customers choosing to participate in the Meter Choices Program. Accordingly, travel costs are estimated at about $0.64 per read (based on 5,000 Meter Choices customers) to about $0.41 per read (based on 20,000 Meter Choices customers).

1.41.2 Please confirm that the labour portion (time spent traveling) is incorporated into the into the travel related costs, and provide an explanation with a cost estimate of this portion.

RESPONSE:

Not confirmed. Labour time for travelling is implicitly included in the calculation of the number of FMAs required as presented in Schedule A-8 of Appendix I.

42.0 Exhibit B-1, page 3-23

Table 3-14 Revenue Requirement – Meter Choices Program

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Revenue Requirement (Current Period)				
Operating Costs ($)	2,388,519	3,141,529	4,168,974	5,085,025
Capital Related Costs ($)	434,503	606,470	773,931	940,677
Total Revenue Requirement (Current Period) ($)	2,823,022	3,747,999	4,942,905	6,025,702
Add: Radio-Off Meter Removal (Future Period) ($)	137,500	275,000	412,500	550,000
Total Revenue Requirement ($)	**2,960,522**	**4,022,999**	**5,355,405**	**6,575,702**
Revenues				
Initial Fee - Radio-Off Option ($)	260,021	495,803	731,584	967,365
Monthly Fee Radio-Off Option ($)	857,684	1,193,559	1,438,964	1,683,629
Monthly Fee - Legacy Meter Option ($)	1,744,129	2,169,696	2,952,267	3,603,421
Total Revenues ($)	**2,861,834**	**3,859,058**	**5,122,815**	**6,254,415**
Remaining TTO & Account Processing Recovery (Years 2 to 4) ($)	41,430	64,680	87,930	111,180
Difference in Expired Meter Seal Exchange Cost (Year 1 less Average) ($)	57,258	99,260	144,660	210,106
Adjusted Revenues ($)	**2,960,522**	**4,022,998**	**5,355,405**	**6,575,701**

1.42.1 Please extend the table to incorporate customer participation at 30,000; 40,000; 50,000 and 60,000.

RESPONSE:

Please refer to the response to CEC IR 1.25.2.

42.0 Exhibit B-1, page 3-23

Table 3-14 Revenue Requirement – Meter Choices Program

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Revenue Requirement (Current Period)				
Operating Costs ($)	2,388,519	3,141,529	4,168,974	5,085,025
Capital Related Costs ($)	434,503	606,470	773,931	940,677
Total Revenue Requirement (Current Period) ($)	2,823,022	3,747,999	4,942,905	6,025,702
Add: Radio-Off Meter Removal (Future Period) ($)	137,500	275,000	412,500	550,000
Total Revenue Requirement ($)	**2,960,522**	**4,022,999**	**5,355,405**	**6,575,702**
Revenues				
Initial Fee - Radio-Off Option ($)	260,021	495,803	731,584	967,365
Monthly Fee Radio-Off Option ($)	857,684	1,193,559	1,438,964	1,683,629
Monthly Fee - Legacy Meter Option ($)	1,744,129	2,169,696	2,952,267	3,603,421
Total Revenues ($)	**2,861,834**	**3,859,058**	**5,122,815**	**6,254,415**
Remaining TTO & Account Processing Recovery (Years 2 to 4) ($)	41,430	64,680	87,930	111,180
Difference in Expired Meter Seal Exchange Cost (Year 1 less Average) ($)	57,258	99,260	144,660	210,106
Adjusted Revenues ($)	**2,960,522**	**4,022,998**	**5,355,405**	**6,575,701**

1.42.2 Please explain how the TTO and Account processing recovery costs are calculated and how they will be recovered from customers in the meter choice program.

RESPONSE:

The details of this calculation are provided in Schedules A-4 of Appendix I in the Application, and are presented in line 175 of the "Cost Tables" tab in Appendix I.

42.0 Exhibit B-1, page 3-23

Table 3-14 Revenue Requirement – Meter Choices Program

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Revenue Requirement (Current Period)				
Operating Costs ($)	2,388,519	3,141,529	4,168,974	5,085,025
Capital Related Costs ($)	434,503	606,470	773,931	940,677
Total Revenue Requirement (Current Period) ($)	2,823,022	3,747,999	4,942,905	6,025,702
Add: Radio-Off Meter Removal (Future Period) ($)	137,500	275,000	412,500	550,000
Total Revenue Requirement ($)	**2,960,522**	**4,022,999**	**5,355,405**	**6,575,702**
Revenues				
Initial Fee - Radio-Off Option ($)	260,021	495,803	731,584	967,365
Monthly Fee Radio-Off Option ($)	857,684	1,193,559	1,438,964	1,683,629
Monthly Fee - Legacy Meter Option ($)	1,744,129	2,169,696	2,952,267	3,603,421
Total Revenues ($)	**2,861,834**	**3,859,058**	**5,122,815**	**6,254,415**
Remaining TTO & Account Processing Recovery (Years 2 to 4) ($)	41,430	64,680	87,930	111,180
Difference in Expired Meter Seal Exchange Cost (Year 1 less Average) ($)	57,258	99,260	144,660	210,106
Adjusted Revenues ($)	**2,960,522**	**4,022,998**	**5,355,405**	**6,575,701**

1.42.3 Please explain how the Difference in Expired Meter Seal Exchange costs is calculated and how they will be recovered from customers in the meter choice program.

RESPONSE:

The details of this calculation are provided in Schedules A-4 of Appendix I in the Application, and are presented in line 176 of the "Cost Tables" tab in Appendix I.

42.0 Exhibit B-1, page 3-23

Table 3-14 Revenue Requirement – Meter Choices Program

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Revenue Requirement (Current Period)				
Operating Costs ($)	2,388,519	3,141,529	4,168,974	5,085,025
Capital Related Costs ($)	434,503	606,470	773,931	940,677
Total Revenue Requirement (Current Period) ($)	2,823,022	3,747,999	4,942,905	6,025,702
Add: Radio-Off Meter Removal (Future Period) ($)	137,500	275,000	412,500	550,000
Total Revenue Requirement ($)	**2,960,522**	**4,022,999**	**5,355,405**	**6,575,702**
Revenues				
Initial Fee - Radio-Off Option ($)	260,021	495,803	731,584	967,365
Monthly Fee Radio-Off Option ($)	857,684	1,193,559	1,438,964	1,683,629
Monthly Fee - Legacy Meter Option ($)	1,744,129	2,169,696	2,952,267	3,603,421
Total Revenues ($)	**2,861,834**	**3,859,058**	**5,122,815**	**6,254,415**
Remaining TTO & Account Processing Recovery (Years 2 to 4) ($)	41,430	64,680	87,930	111,180
Difference in Expired Meter Seal Exchange Cost (Year 1 less Average) ($)	57,258	99,260	144,660	210,106
Adjusted Revenues ($)	**2,960,522**	**4,022,998**	**5,355,405**	**6,575,701**

1.42.4 Please explain how BC Hydro will recover cost from Meter Choice customers in the event that the costs are higher than anticipated.

RESPONSE:

Please refer to the response to BCUC IR 1.6.5.2.

43.0 Exhibit B-1 page 3-24

Table 3-15 Radio-Off Meter Option Capital Related Costs

	Number of Meter Choice Customers			
	5,000	10,000	15,000	20,000
Amortization				
IT Integration – 10-Year Life ($)	123,858	123,858	123,858	123,858
Handheld Units – 3-Year Life ($)	17,411	27,084	32,887	38,691
Telecom Range Extenders – 27-Year Life[22] ($)	39,687	79,244	118,802	158,098
Check Meters – 5-Year Life ($)	80,000	120,000	160,000	200,000
Total Amortization to be Recovered ($)	260,956	350,186	435,547	520,647
Finance Charges ($)	79,906	118,001	155,802	193,394
Return on Equity ($)	93,641	138,284	182,583	226,636
Total Capital Related Costs ($)	**434,503**	**606,471**	**773,932**	**940,677**

Finance charges are based on a rate of 4.36 per cent, which reflects BC Hydro's weighted average cost of debt forecasted for F2015 as of August 2013. The calculated Return on Equity is based on a cost of equity of 11.84 per cent, and in accordance with Heritage Special Direction No. HC2 deemed equity of 30 per cent of plant in service is assumed.

1.43.1 Please extend the table to include 30,000; 40,000; 50,000 and 60,000 customers.

RESPONSE:

Please refer to the response to CEC IR 1.25.2.

44.0 Exhibit B-1, page 3-27 and 3-28

> BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).
>
> The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.1 Please confirm that BC Hydro would not undertake additional time to communicate with a customer in a situation in which the customer's premises were blocked from an attempted installation.

RESPONSE:

Following the failed installation attempt, the failed installation charge will be added to the customer's bill, and BC Hydro will have communication with the customer regarding the failed installation issue.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.1.1 Please confirm that the call centre cost at $10 per call for a 5 minute call is about $2 per minute.

RESPONSE:

Confirmed.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.1.2 If not confirmed, please provide the appropriate calculation for different call lengths.

RESPONSE:

Please refer to the response to CEC IR 1.44.1.1.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.2 Please confirm that the call centre costs are based on standard labour costs.

RESPONSE:

The call centre is operated under contract with ABSBC, and call centre staff are employed by ABSBC.

44.0 Exhibit B-1, page 3-27 and 3-28

> BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).
>
> The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.3 If not confirmed, please provide the standard labour costs for each position.

RESPONSE:

Please refer to the response to CEC IR 1.44.2.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.4 Please provide the documentation of the standard labour costs detailing the breakdown of the component costs for each position.

RESPONSE:

Please refer to the response to CEC IR 1.44.2.

44.0 Exhibit B-1, page 3-27 and 3-28

> BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).
>
> The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.5 To the extent that the documentation does not breakdown the component costs, please supply BC Hydro's breakdown of the component costs of each labour position.

RESPONSE:

Please refer to the response to CEC IR 1.44.2.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.6 Please quantify the supervisory labour and management staff that is required to manage the additional labour.

RESPONSE:

No additional management or supervisory resources are expected.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.7 On what basis did BC Hydro select an average call length of about 5 minutes?

RESPONSE:

Based on the call type, and in the absence of any empirical data regarding the length of calls related to the failed installation, it is BC Hydro's view that a five minute call is appropriate.

44.0 Exhibit B-1, page 3-27 and 3-28

> BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).
>
> The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.8 Has it been BC Hydro's experience that communications with customers who have refused smart meter installations and not permitted access require approximately 5 minutes to resolve?

RESPONSE:

Please refer to the response to CEC IR 1.44.7.

44.0 Exhibit B-1, page 3-27 and 3-28

BC Hydro proposes a failed installation charge which consists of the (expected) average cost of attendance at a customer's premises and the average cost for the call centre cost to contact the customer following the failed meter installation. These costs are estimated at $65 (i.e., $55 for attendance at customer's premises and $10 for call centre).

The $55 estimated cost to attend the customer's premises is discussed in section 3.4.1.1 and is the same as that included in the radio-off option Initial Charge. Call centre costs (at $10 per call) are based on an average call length of about 5 minutes.

1.44.8.1 If not, please provide BC Hydro's estimate of the time it takes to resolve a situation in which a customer has blocked or otherwise not permitted access to allow meter installation.

RESPONSE:

Not applicable. Please refer to the response to CEC IR 1.44.7.

45.0 Exhibit B-1, Appendix I

Blended Standard Labour Rate to Upper Band of 47.3 FMAs	$ 133,312	$ 133,312	$ 133,312	$ 133,312
FMA Standard Labour Rate	103,890	103,890	103,890	103,890
Support Staff Standard Labour Rate	143,356	143,356	143,356	143,356

1.45.1 Please provide an explanation of the positions represented by the Blended Standard Labour Rate to Upper Band of 47.3 FMAs.

RESPONSE:

This is a feature of the contract with ABSBC. It is the per FMA rate applicable per FMA up to a level of 47.3 FMA FTEs.

45.0 Exhibit B-1, Appendix I

Blended Standard Labour Rate to Upper Band of 47.3 FMAs	$ 133,312	$ 133,312	$ 133,312	$ 133,312
FMA Standard Labour Rate	103,890	103,890	103,890	103,890
Support Staff Standard Labour Rate	143,356	143,356	143,356	143,356

1.45.1.1 Please explain how these costs were derived.

RESPONSE:

These costs are specified in the contract with ABSBC for meter reading and related services.

45.0 Exhibit B-1, Appendix I

Blended Standard Labour Rate to Upper Band of 47.3 FMAs	$ 133,312	$ 133,312	$ 133,312	$ 133,312
FMA Standard Labour Rate	103,890	103,890	103,890	103,890
Support Staff Standard Labour Rate	143,356	143,356	143,356	143,356

1.45.2 Please provide an explanation as to the FMA standard Labour Rate and how it was derived.

RESPONSE:

These costs are specified in the contract with ABSBC for meter reading and related services. The derivation of these costs, and their underlying components, is not known to BC Hydro.

45.0 Exhibit B-1, Appendix I

Blended Standard Labour Rate to Upper Band of 47.3 FMAs	$ 133,312	$ 133,312	$ 133,312	$ 133,312
FMA Standard Labour Rate	103,890	103,890	103,890	103,890
Support Staff Standard Labour Rate	143,356	143,356	143,356	143,356

1.45.3 Please provide an explanation as to the Support Staff standard Labour rate.

RESPONSE:

These costs are specified in the contract with ABSBC for meter reading and related services. The derivation of these costs, and their underlying components, is not known to BC Hydro.

46.0 Contingencies

1.46.1 Please confirm that when BC Hydro is making significant cost estimates, for instance for its SMI initiative, BC Hydro regularly adds a contingency estimate to its costing to allow for uncertainty and unknowns.

RESPONSE:

For the purposes of budgeting for large capital expenditures, BC Hydro often includes a contingency in the budgeted amounts.

46.0 Contingencies

1.46.2 Please indicate whether or not contingency estimates have been incorporated into the costing for the BC Hydro smart meter customer choice program.

RESPONSE:

Contingency estimates have not been included in the cost analysis of the Meter Choices Program.

46.0 Contingencies

1.46.2.1 If so, please provide the total contingency estimate.

RESPONSE:

Please refer to the response to CEC IR 1.46.2.

46.0 Contingencies

1.46.2.2 If not, please provide a reasonable contingency estimate for all costs.

RESPONSE:

BC Hydro does not view the addition of contingency amounts to the cost estimates that will be used directly in the determination of standard charges to be appropriate. Since costs underlying the proposed charges are estimates, there is some band of uncertainty around these cost estimates, both positive and negative, and BC Hydro has attempted to provide estimates at the mid-point of this band of uncertainty. The inclusion of contingency amounts in the proposed charges would seem to suggest that actual costs can only be higher than estimated.

47.0 Productive Time Estimates

1.47.1 Please provide a list of all calculations dependent upon a determination of productive time available from employees, whether for cost estimating or for quantity estimating.

RESPONSE:

In all calculations wherein services are provided through labour employed directly by BC Hydro, standard labour rates are applied. These standard labour rates are applicable to productive hours (i.e., 1,566 per annum), and include allowances for vacation, statutory holidays, sick time, etc. With the exception of the time required for the radio-off firmware update, labour requirements have been assessed based on the expected output of the particular BC Hydro resource. The radio-off firmware update is expected to take 25 minutes, and the standard labour rate is applied to this time requirement. Consequently, unproductive time during the 1,566 hours per year has not been taken into consideration, since aside from the time included in the calculation of 1,566 hour per year, unproductive time is likely very small.

Where labour services are provided through contractors (i.e., ABSBC) the costs identified reflect the amounts paid by BC Hydro to provide the service and fulfill the task requirements, and implicitly incorporate allowances for non-productive time. Cost items which include a labour component provided by contractors include the following:

Cost Item	Basis of Labour Cost (units)
Customer Account Processing	**Per transaction**
Meter Exchange	**Per exchange**
Training and Transition to Operations	**Hourly rate applied to hours required**
IT Integration	**Hourly rate applied to hours required**
Annual IT Maintenance and Support	**Industry standard percentage applied to total IT capital expenditures**
Meter Reading	**Per each FMA FTE required**
Range Extender – Survey and Design	**Per survey and design**
Range Extender Installation	**Average cost per installation**
Failed Installation – Call Centre	**Time per call (adjusted productive hours)**
Field Investigation	**Per each line contractor (plus vehicle) required**

47.0 Productive Time Estimates

1.47.2 Please provide a list of, and descriptions for, types of non-productive time (ie. non-direct task time) such as, dealing with supervisor, training time, filling out time sheets, completing other forms of administrative reporting, weather or traffic disruption, etc.

RESPONSE:

Given the responses to CEC IRs 1.47.1 and 1.47.3, the requested information is not useful and BC Hydro declines to respond.

47.0 Productive Time Estimates

1.47.3 Please indicate for each instance where productive time estimates are used whether or not an allowance for non-productive time should be incorporated into the calculations.

RESPONSE:

An allowance for productive time has been incorporated into the call centre component of the failed installation charge, wherein it is assumed that the average number of minutes spent conversing with customers per year is 48,000. With the exception of the radio-off firmware update, the number of hours or units required is based on the productivity (output) per hour or unit, including non-productive activities. Thus, no additional allowance is required. If an adjustment to the radio-off firmware update is considered necessary to reflect non-productive time, it is BC Hydro's view that such an adjustment would be very small (i.e., less than 5 per cent).

47.0 Productive Time Estimates

1.47.3.1 If so, please provide the details of the non-productive time estimates used by BC Hydro and if non-productive time has not been incorporated in BC Hydro's estimates please provide an estimate for the amount of non-productive time that should be included.

RESPONSE:

Please refer to the response to CEC IR 1.47.3.

David M. Aaron

Barrister & Solicitor

November 8, 2013

By Electronic Mail

British Columbia Hydro and Power Authority
6th Floor - 333 Dunsmuir Street
Vancouver, BC V6B 5R3

Attention: Janet Fraser, Chief Regulatory Officer

Dear Sirs / Mesdames:

Re: BC Hydro smart meter opt-out

Re: BC Hydro Smart Meter Choices Application

The following information requests are advanced on behalf of the Citizens for Safe Technology Society and Nomi Davis *et al.* in relation to the proceedings initiated by way of the British Columbia Hydro and Power Authority ("BCH") application of October 7, 2013 ("the BCH Application").

BCH customer categories

1. BCH claims approximately 1.9 million customers. Please particularize how many customers are in each of the following categories: residential, business & light industrial; and heavy industrial.

2. Are heavy industrial customers going to be smart meter customers?

3. When, if ever, will heavy industrial customers be placed on the smart grid system and what share of the smart grid system costs will they bear?

4. Of the 60,000 holdouts, what proportion is from the residential category and what proportion is from the business & light industrial category?

5. What category or categories of customers is/are to account for the 15,000 customers referenced in the BCH Application at page 1-1, line 19, in the

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Tel: 250.551.6840 Fax: 866.685.7376
david@legalmind.ca

following terms: “about 15,000 smart meter installations that have not been completed for various reasons”?

Who has been given a choice?

6. Does BCH acknowledge that the customer has the option of either keeping the legacy meter or of having a radio-off meter installed?

BCH states:

> All customers were provided with advanced notification of smart meter installation at their home or business and information about what they could expect during the meter exchange process.[1]

7. Were all customers provided with a choice as to whether to have their analogue meter retained, replaced by a radio-off meter or replaced by a smart meter?

8. Did BCH ever install a smart meter at a residence where the customer had posted a conspicuous notice to BCH indicating the customer’s objection to the installation of a smart meter? If so, in how many instances did such an installation occur?

9. Please indicate why BCH customers were not individually asked whether or not they would like a smart meter installation.

Holdout customers

BCH states:

> While the majority of BC Hydro’s approximately 1.9 million customers have accepted the installation of a smart meter at their premises, a small portion of customers have requested that the smart meter installation at their premises be put on hold.[2]

10. Has BCH installed smart meters at the homes of any customers who have requested that the smart meter installation at their premises be put on hold?

---

[1] [1] BCH Application, page 2-2, lines 2 - 4
[2] BCH Application, page 1-1, lines 11 - 12

11. Has BCH installed smart meters at the homes of any customers who have requested that the smart meter installation at their premises be put on hold and who have maintained that request and not resiled from that request?

Installations "put on hold"

12. The BCH Application at page 2-3, lines 3-4, 8-13 and 15, states that 60,000 customers requested that their smart meter installations be 'put on hold'. Would it be more accurate to say that these customers informed BC Hydro (by mail, phone or email prior to September 1, 2013) that they outright refused the installation of a smart meter on their property at any time?

13. Why does the BCH Application repeatedly present the false notion that these customers requested that their installations be 'put on hold'? Was the BCH Application drafted with the intent of downplaying the existence of manifest implacable customer opposition to BCH's intent to replace their analogue meters with smart meters?

14. Of your customers who now have smart meters, how many have contacted you, subsequent to the installation of their smart meter, to request that their smart meter be removed? Would it be reasonable for these customers to be permitted to participate in the opt-out program? Would their participation in the opt-out program lower the per-read cost of administering the opt-out program?

Customers who have suffered the installation of a smart meter against their will

15. Many BCH customers (also members of CSTS) have suffered the installation of a smart meter notwithstanding that those customers had explicitly indicated their refusal by way of correspondence to BC Hydro or conspicuous signage on their former analogue meters. In some cases, the installation has occurred when the customer was not home. In other cases, BC Hydro has used misinformation, coercion and/or manipulation to achieve the installation of the smart meter. See, for example, the case of Nomi Davis by video at the following link:

    http://www.youtube.com/watch?v=8FSDdeXm8dQ

16. Why is BCH not offering an opt-out opportunity to these customers who have suffered the installation of a smart meter against their will? On what principled basis is BC Hydro limiting the opt-out opportunity to customers who have managed to hold out to date?

17. Why should a customer with a smart meter not be able to elect to have it replaced with a non-emitting meter?

Continued eligibility upon a move

18. How does BCH propose to treat an opt-out customer (such as one who is presently being included in BCH's proposed opt-out program), where that customer moves to a residence that already has a smart meter? Will that opt-out customer be able to carry her opt-out choice with her? What if she is a gestating or nursing mother and she has made a choice to raise her baby in an environment free from radio-frequencies? What if she is a person who claims to be electrohypersensitive?

Commercial customers

19. While FortisBC is offering an opt-out opportunity to commercial customers, BCH is not proposing to. Why not? Many commercial customers spend more time at their places of business than they do at home. What principled basis does BCH have for limiting the offer of an opt-out opportunity to residential customers?

Direct correspondence

20. Please provide statistics as to the choices and/or responses that BCH customers have made to date in reply to the BC Hydro correspondence described at sections 2.3.3.1 and 2.3.3.2 of the BCH Application.

Useless smart meters

21. Can you confirm that BCH has installed smart meters in areas that do not yet have the infrastructure to run the smart grid ("the Undeveloped Areas")?

22. Please provide a geographical description of the Undeveloped Areas.

23. Can you confirm that, within the Undeveloped Areas, BCH is continuing to manually read meters at premises notwithstanding that smart meters have been installed at these premises?

24. How long will it be until the necessary smart grid infrastructure is put in place so as to eliminate the need for manual meter reading in the Undeveloped Areas?

25. How can BCH justify the imposition of an opt-out fee in Undeveloped Areas if manual meter reading is occurring anyway at premises in these areas regardless of whether they have a smart meter or not?

Estimated opt-out numbers?

26. How many customers would BCH expect to opt out in the event that the cost for opting out was nil?

27. Does Table 3-13 in the BCH Application indicate that the cost per read decreases with an increase in the number of customers that opt out?

28. Would the per-premises costs of the BCH opt-out program be lower if it offered an opt-out opportunity to all customers who wish to opt out, including those who have somehow suffered the installation of a smart meter against their will?

29. Does Table 3-2 on page 3-4 of the BCH Application show a correlation between the affordability of the opt-out fee and the percentage of customers who opt out?

30. Does BCH expect that there will be a correlation between the amount of the opt-out fee and the number of customers who are deterred from opting out?

31. Is BCH using the opt-out fee to deter customers from opting out?

32. Does BCH anticipate different opt-out volumes if the charges for opting out are somewhat different from those currently proposed?" If yes, explain the degree of elasticity BCH is anticipating.

33. Please add a column to Table 3-2 showing the date when the utility commenced offering an opt-out choice.

Charges

34. Why would there be an "initial charge" for legacy meters when no change in meter or location is needed outside of the conditions where a change may be necessary due to in-service expiry?

35. Why would there be a full "initial charge" for the radio-off meter when the only difference between it and the no-charge, radio-on option is the decommissioning of the radio transmission feature?

36. Why would there be a *monthly* charge when a legacy meter typically has been read once every two months (and in some cases annually) where a customer has been on a monthly payment program that is reconciled as to actual consumption once a year? Is there to be a withdrawal of that service option for BCH customers?

37. Is it the intention of BCH to have legacy and radio-off meters read bi-monthly in some circumstances? If so, how is a monthly opt-out fee justified in that context?

38. Under the regime contemplated by the present BCH Application, may a given customer elect to have their meter read less often so as to reduce the frequency of the proposed per-read fee? What options can be made available to customers in that regard?

39. Under the regime contemplated by the present BCH Application, may opt-out customers elect to be billed on an equal payment basis, based on the previous year's consumption patterns, with a single reading at the end of the year to confirm actual usage? Would this manner of billing reduce the per-read fee to an annual occurrence?

40. How would the proposed opt-out fees account for the reduced costs associated with administering the opt-out program in relation to:

    a. a multi-unit dwelling where several opting-out customers share the same address while not the same account or meter?

    b. a town house complex, condominium or co-op housing complex where all the residents have chosen to opt out?

c. a neighbourhood block where all the residents have chosen to opt out?

d. a customer who has more than one meter on her property (e.g. a single customer who has five meters on her property)?

41. Does BCH take the position that the actual cost of physically reading each meter (that is a legacy or radio-off meter) will be uniform?

42. Would BCH be willing to alter its proposed tariff to charge fees that relate specifically to each customer's physical meter circumstances, such as those circumstances enumerated in sub-paragraphs (a) - (d) above?

43. Please confirm that there is a discrepancy between a flat, per-meter reading fee and the possible reality that the same customer at the same address may have more than one meter or that several customers at the same address will not cause per-meter service expenses for BCH that are as great as for a single customer at a single address.

44. Why is there a marginal cost to be recovered from opting-out customers if grid modernization is to be done in any case and grid modernization costs are (or will be) incorporated into the general operating cost of BCH's system?

45. Given that forecasting costs is admittedly very uncertain and imprecise, has BCH considered the possibility of deferring the final establishment of costs to a future point?

Billing costs

46. Historically, what has been the annual cost associated with billing residential customers?

47. Historically, what has been the annual cost associated with billing business and light industrial customers?

48. What is the expected total annual billing cost for residential customers (post smart meter installation) as determined by BCH in the context of this application?

49. What is the expected total annual billing cost for business and light industrial customers (post-smart meter installation) as determined by BCH in the context of this application?

Electric cars

50. Does BCH suggest that smart meters will facilitate better service to cars powered by electricity?

51. What makes electricity delivered via smart meters any different from electricity delivered via legacy meters or radio-off meters?

Range extenders

BCH states:

> The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

> The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

52. How is the cost of a range extender a cost attributable to providing services to an opt-out customer?

53. How is it that a single customer decision to opt out can affect "program costs, integration costs, and infrastructure costs"?

54. Have smart grid program costs, integration costs and infrastructure costs been externalized so as to be carried by individual customers, including those opting out from the smart meter program?

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[3] BCH Application, page 1-1, lines 22 - 25
[4] BCH Application, page 1-2, lines 14 - 15

55. Apart from the context of a customer opt-out, what role do RF range extenders have in the BCH smart meter program?

56. Can the BCH smart meter program operate without the use of RF range extenders?

57. Apart from the context of a customer opt-out, will the BCH smart meter program utilize RF range extenders? If so, how many units will be utilized and in what context will they be deployed?

58. Where BCH installs an RF range extender in order to fill a "gap" created by a given customer's opt-out choice, how much distance will there be between that RF range extender and the residential dwelling of the given customer? Will BCH commit to a minimum distance in that regard?

59. What is the power density output of an RF range extender at various given distances?

60. Is the cost of the RF range extender a cost of reading an opt-out customer's meter?

61. Is the cost of the RF range extender a cost of providing power to an opt-out customer?

62. Why should an opt-out customer pay for the communication infrastructure of the smart meter program in which he/she is not participating?

63. What is the per unit cost of an RF range extender and the field cost for overcoming the difficulty created by the customers estimated to be radio-off and legacy meter customers?

Failed installation charges

64. Can the costs associated with failed installations be avoided by honouring a customer's express refusal to allow the installation of a smart meter on his or her property?

65. Does BCH take the position that it is entitled, according to the terms of the current tariff, to install a microwave emitting smart meter at a customer's property and attend the property for that purpose? If so, why is BCH

applying to amend the current tariff? If not, then on what basis did BCH install smart meters on the properties of customers who explicitly indicated their refusal by way of correspondence to BC Hydro or conspicuous signage on their former analogue meters?

66. Will BCH refrain from making chargeable visits to customers who have formally elected to opt out by either keeping their legacy meter or by requesting a radio-off meter?

67. Will BCH be forgoing the enforcement of the failed installation charge for all customer visits prior to November 15, 2013? If not, why not?

68. Will BCH charge a failed installation charge to customers who, at the material time, had explicitly indicated their refusal by way of correspondence to BC Hydro or conspicuous signage on their former analogue meters?

69. The proposed failed installation charge will apply to failed installations as of when?

Moves

70. When an opt-out customer moves, will he or she be able to continue to opt out at his or her new premises? Will a new set-up fee apply?

Travel time

71. What alternatives has BCH explored to having vehicles travel to the premises of each opt-out customer?

72. Would it be possible for opt-out customers to use a USB memory stick or some other device to download radio-off meter data and send such data to BCH over the internet? If not, why not?

73. Will the BCH radio-off and legacy meters have a glass face through which consumption data can be seen and photographed? Can such a photograph be emailed by a customer to BCH so as to communicate consumption data at any given time? Would BCH be able to audit such a practice of customer self-reporting? What would the costs of such a program be?

Meter readers

74. Apart from the proposed opt-out program, does BCH plan to employ field meter readers?

The cost of turning radios off

75. Can the cost of turning radios off (for opt-out customers) be reduced by specifying to the equipment provider that a number of new meters be delivered to BCH in a radio-off configuration?

76. Can the cost of turning radios off (for opt-out customers) be reduced by having BCH turn those radios off before they are installed at customer residences?

Opt-out revenue

77. Can BCH confirm what revenue it will derive in opt-out fees on the basis of likely radio-off and legacy customers?

Other utilities

78. Do any jurisdictions and/or utilities worldwide provide their customers with an option to opt out without having to pay a fee in relation to the opt-out?

79. Do any jurisdictions and/or utilities worldwide provide their customers with an option to opt out by payment of a fee that is less than that proposed by BCH in the present Application?

80. Is the legality and/or implementation of an opt-out fee pending or subject to regulatory approval in any jurisdiction worldwide?

81. Can you confirm that utilities in New Mexico, Eugene and Ashland allow for an opt-out without fee?

82. What are the features of the opt-out program in Quebec?

83. What opt-out fee is being sought by the utility in Kauai?

Special customers

84. Under the regime contemplated by the present BCH Application, will BCH waive the opt-out fee for customers who suffer from a disability that prevents them from accessing environments where exposure to radio-frequency emissions is ongoing and incessant?

85. Under the regime contemplated by the present BCH Application, will BCH waive the opt-out fee for customers who are under some degree of financial hardship?

Nature of data

86. Where data is manually downloaded from radio-off meters, what data (besides usage information) is being collected and how is such data useful to BCH if it is not collected in real time?

BCH Application - Chapter 3 - Meter Choice Program Costs - page 3-9; Table 3-4; "Radio-Off Information Technology Capital Costs"

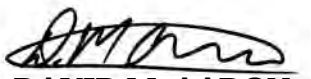
87. BCH presents this as a non-variable total cost of $1,238,577 regardless of numbers of opt-out customers.

88. Is this an annual cost or a one-time setup cost? If it is an annual cost in part, what proportion is variable?

89. If it is all or in a large part a one-time cost, why would it not be better to include it in the general rate-base?

Thank you for your attention to this matter.

Yours truly,



DAVID M. AARON

cc: BCUC
cc: clients
cc: intervener parties

BCH customer categories

1.1 BCH claims approximately 1.9 million customers. Please particularize how many customers are in each of the following categories: residential, business & light industrial; and heavy industrial.

RESPONSE:

BC Hydro declines to provide the requested information on the basis that is not relevant to the scope of this proceeding.

BCH customer categories

1.2 Are heavy industrial customers going to be smart meter customers?

RESPONSE:

Although the requested information is not relevant to the scope of this proceeding, BC Hydro confirms that customers taking service at transmission voltages (including industrial customers) already have meters with most if not all of the capabilities of smart meters. These meters have been in use for industrial customers for decades.

BCH customer categories

1.3 When, if ever, will heavy industrial customers be placed on the smart grid system and what share of the smart grid system costs will they bear?

RESPONSE:

BC Hydro declines to provide the requested information on the basis that is not relevant to the scope of this proceeding.

BCH customer categories

1.4 Of the 60,000 holdouts, what proportion is from the residential category and what proportion is from the business & light industrial category?

RESPONSE:

Please refer to the response to BCUC IR 1.1.4.

BCH customer categories

1.5 What category or categories of customers is/are to account for the 15,000 customers referenced in the BCH Application at page 1-1, line 19, in the following terms: “about 15,000 smart meter installations that have not been completed for various reasons”?

RESPONSE:

Please refer to the response to BCUC IR 1.1.4.

Who has been given a choice?

1.6 Does BCH acknowledge that the customer has the option of either keeping the legacy meter or of having a radio-off meter installed?

RESPONSE:

BC Hydro does not fully understand the question. Customers that are eligible for the Meter Choices Program may choose a smart meter, a radio-off meter or a legacy meter.

Who has been given a choice?

BCH states:

All customers were provided with advanced notification of smart meter installation at their home or business and information about what they could expect during the meter exchange process.[1]

1.7 Were all customers provided with a choice as to whether to have their analogue meter retained, replaced by a radio-off meter or replaced by a smart meter?

RESPONSE:

No. Fewer than 75,000 customers are eligible for the Meter Choices Program.

[1] BCH Application, page 2-2, lines 2 - 4

Who has been given a choice?

BCH states:

All customers were provided with advanced notification of smart meter installation at their home or business and information about what they could expect during the meter exchange process.[1]

1.8 Did BCH ever install a smart meter at a residence where the customer had posted a conspicuous notice to BCH indicating the customer's objection to the installation of a smart meter? If so, in how many instances did such an installation occur?

RESPONSE:

BC Hydro declines to provide the requested information on the basis that it is not relevant to the scope of this proceeding.

Who has been given a choice?

BCH states:

All customers were provided with advanced notification of smart meter installation at their home or business and information about what they could expect during the meter exchange process.[1]

1.9 Please indicate why BCH customers were not individually asked whether or not they would like a smart meter installation.

RESPONSE:

BC Hydro declines to provide the requested information on the basis that it is not relevant to the scope of this proceeding.

Holdout customers

BCH states:

While the majority of BC Hydro's approximately 1.9 million customers have accepted the installation of a smart meter at their premises, a small portion of customers have requested that the smart meter installation at their premises be put on hold.[1]

1.10 Has BCH installed smart meters at the homes of any customers who have requested that the smart meter installation at their premises be put on hold?

RESPONSE:

BC Hydro declines to provide the requested information on the basis that it is not relevant to the scope of this proceeding.

[1] BCH Application, page 1-1, lines 11 - 12

Holdout customers

BCH states:

While the majority of BC Hydro's approximately 1.9 million customers have accepted the installation of a smart meter at their premises, a small portion of customers have requested that the smart meter installation at their premises be put on hold.[2]

1.11 Has BCH installed smart meters at the homes of any customers who have requested that the smart meter installation at their premises be put on hold and who have maintained that request and not resiled from that request?

RESPONSE:

BC Hydro declines to provide the requested information on the basis that it is not relevant to the scope of this proceeding.

Installations "put on hold"

1.12 The BCH Application at page 2-3, lines 3-4, 8-13 and 15, states that 60,000 customers requested that their smart meter installations be 'put on hold'. Would it be more accurate to say that these customers informed BC Hydro (by mail, phone or email prior to September 1, 2013) that they outright refused the installation of a smart meter on their property at any time?

RESPONSE:

No.

Installations "put on hold"

1.13 Why does the BCH Application repeatedly present the false notion that these customers requested that their installations be 'put on hold'? Was the BCH Application drafted with the intent of downplaying the existence of manifest implacable customer opposition to BCH's intent to replace their analogue meters with smart meters?

RESPONSE:

It is not correct to suggest that each of the approximately 60,000 customers that requested that their smart meter installation be put on hold are or were implacably opposed to smart meters. BC Hydro assumes that of the 60,000, approximately 10,000 will choose to retain a legacy meter or have a radio-off meter installed under the Meter Choices Program, and 50,000 will choose a smart meter.

Installations "put on hold"

1.14 Of your customers who now have smart meters, how many have contacted you, subsequent to the installation of their smart meter, to request that their smart meter be removed? Would it be reasonable for these customers to be permitted to participate in the opt-out program? Would their participation in the opt-out program lower the per-read cost of administering the opt-out program?

RESPONSE:

Eligibility for the Meter Choices Program is specified in sections 4.2.1 and 4.2.2 of the BC Hydro Electric Tariff, as approved by the BCUC in accordance with Direction No. 4.

Customers who have suffered the installation of a smart meter against their will

1.15 Many BCH customers (also members of CSTS) have suffered the installation of a smart meter notwithstanding that those customers had explicitly indicated their refusal by way of correspondence to BC Hydro or conspicuous signage on their former analogue meters. In some cases, the installation has occurred when the customer was not home. In other cases, BC Hydro has used misinformation, coercion and/or manipulation to achieve the installation of the smart meter. See, for example, the case of Nomi Davis by video at the following link: http://www.youtube.com/watch?v=8FSDdeXm8dQ

RESPONSE:

No question identified.

Customers who have suffered the installation of a smart meter against their will

1.16 Why is BCH not offering an opt-out opportunity to these customers who have suffered the installation of a smart meter against their will? On what principled basis is BC Hydro limiting the opt-out opportunity to customers who have managed to hold out to date?

RESPONSE:

Eligibility for the Meter Choices Program is specified in sections 4.2.1 and 4.2.2 of the BC Hydro Electric Tariff, as approved by the BCUC in accordance with Direction No. 4.

Customers who have suffered the installation of a smart meter against their will

1.17 Why should a customer with a smart meter not be able to elect to have it replaced with a non-emitting meter?

RESPONSE:

Eligibility for the Meter Choices Program is specified in sections 4.2.1 and 4.2.2 of the BC Hydro Electric Tariff, as approved by the BCUC in accordance with Direction No. 4.

0Continued eligibility upon a move

1.18 How does BCH propose to treat an opt-out customer (such as one who is presently being included in BCH's proposed opt-out program), where that customer moves to a residence that already has a smart meter? Will that opt-out customer be able to carry her opt-out choice with her? What if she is a gestating or nursing mother and she has made a choice to raise her baby in an environment free from radio-frequencies? What if she is a person who claims to be electrohypersensitive?

RESPONSE:

Please refer to sections 4.2.3(d) and (e), and 4.2.4(b) and (c) of the BC Hydro Electric Tariff.

Commercial customers

1.19 While FortisBC is offering an opt-out opportunity to commercial customers, BCH is not proposing to. Why not? Many commercial customers spend more time at their places of business than they do at home. What principled basis does BCH have for limiting the offer of an opt-out opportunity to residential customers?

RESPONSE:

Eligibility for the Meter Choices Program is specified in sections 4.2.1 and 4.2.2 of the BC Hydro Electric Tariff, as approved by the BCUC in accordance with Direction No. 4.

0Direct correspondence

1.20 Please provide statistics as to the choices and/or responses that BCH customers have made to date in reply to the BC Hydro correspondence described at sections 2.3.3.1 and 2.3.3.2 of the BCH Application.

RESPONSE:

The Meter Choices Program enrolment period is underway and will end on December 1, 2013. Rather than provide mid-enrolment period data with its response to Round 1 IRs, BC Hydro believes it would be more efficient to provide data in relation to Meter Choices Program enrolment with its response to Round 2 IRs which are scheduled to be filed after the enrolment period ends. Accordingly, BC Hydro will provide Meter Choices Program enrolment data with its response to Round 2 IRs.

Useless smart meters

1.21 Can you confirm that BCH has installed smart meters in areas that do not yet have the infrastructure to run the smart grid ("the Undeveloped Areas")?

RESPONSE:

Confirmed. Smart meters have been installed in areas where it is impracticable because of distance, electromagnetic interference, physical obstruction or other similar causes for BC Hydro to establish a telecommunications link between the smart meter at the customer's premises and BC Hydro's systems. In those situations, BC Hydro has not established the referenced telecommunications links as contemplated by section 3(3) of the Smart Meters and Smart Grid Regulation.

Useless smart meters

1.22 Please provide a geographical description of the Undeveloped Areas.

RESPONSE:

There is no particular geographic description for these areas because there are diverse reasons for the impracticability to establish the telecommunications links. Please refer to the response to CSTS IR 1.21.

Useless smart meters

1.23 Can you confirm that, within the Undeveloped Areas, BCH is continuing to manually read meters at premises notwithstanding that smart meters have been installed at these premises?

RESPONSE:

BC Hydro continues to maintain a schedule of meters that must be read manually (by Field Metering Analysts employed by Accenture Business Services of B.C.). Included on this list is any meter that has not yet been converted to automated reading and billing under the Smart Metering Program. In what this question refers to as "Undeveloped Areas" (based on definition in CSTS IR 1.21), BC Hydro continues to keep these meters on the schedule of meters requiring manual reading.

Useless smart meters

1.24 How long will it be until the necessary smart grid infrastructure is put in place so as to eliminate the need for manual meter reading in the Undeveloped Areas?

RESPONSE:

BC Hydro does not have a timetable for the expansion of Field Area Network (FAN) and Wide Area Network (WAN) coverage to include any or all of these meters, as this is dependent upon a number of factors which drive the general economic efficiency of expanding FAN and WAN coverage.

Useless smart meters

1.25 How can BCH justify the imposition of an opt-out fee in Undeveloped Areas if manual meter reading is occurring anyway at premises in these areas regardless of whether they have a smart meter or not?

RESPONSE:

The new charges are applicable to customers that have a legacy meter or radio-off meter installed at their premises by their election or deemed election in accordance with Direction No. 4. Customers with smart meters installed at their premises, even those in the "Undeveloped Areas" as defined in CSTS IR 1.21, do not cause BC Hydro to incur the additional Meter Choices Program costs.

Estimated opt-out numbers?

1.26 How many customers would BCH expect to opt out in the event that the cost for opting out was nil?

RESPONSE:

At the proposed charges for the radio-off meter and legacy meter options, BC Hydro expects that 10,000 customers will participate in the Meter Choices Program. BC Hydro has not forecast what the rate of participation would be assuming participation in the Program is free of charge. However, basic economic theory suggests that demand will increase as the price decreases. Accordingly, at a price of zero it would be expected that the number of customers choosing to participation in the Meter Choices Program would be greater than 10,000.

Estimated opt-out numbers?

1.27 Does Table 3-13 in the BCH Application indicate that the cost per read decreases with an increase in the number of customers that opt out?

RESPONSE:

Yes.

Estimated opt-out numbers?

1.28 Would the per-premises costs of the BCH opt-out program be lower if it offered an opt-out opportunity to all customers who wish to opt out, including those who have somehow suffered the installation of a smart meter against their will?

RESPONSE:

If the number of customers choosing to participate in the Meter Choices Program increases, the cost per customer will decrease.

Estimated opt-out numbers?

1.29 Does Table 3-2 on page 3-4 of the BCH Application show a correlation between the affordability of the opt-out fee and the percentage of customers who opt out?

RESPONSE:
As noted at lines 12 to 14 on page 3-3 of the Application, participation rates "appear to be negatively correlated with the level of charges to customers for smart meter alternatives."

Estimated opt-out numbers?

1.30 Does BCH expect that there will be a correlation between the amount of the opt-out fee and the number of customers who are deterred from opting out?

RESPONSE:

The charges proposed in the Application for the legacy and radio-off meter options are based on the assumption that 5,000 customers take each option.

Estimated opt-out numbers?

1.31 Is BCH using the opt-out fee to deter customers from opting out?

RESPONSE:

No. The new charges have been calculated to recover additional costs incurred by BC Hydro.

Estimated opt-out numbers?

1.32 Does BCH anticipate different opt-out volumes if the charges for opting out are somewhat different from those currently proposed?" If yes, explain the degree of elasticity BCH is anticipating.

RESPONSE:

BC Hydro expects that the level of participation in the Meter Choices Program will be dependent upon the charges for each option. However, the determination of the price elasticity demand would be difficult due to the lack of relevant and robust data, and has not been estimated.

Estimated opt-out numbers?

1.33 Please add a column to Table 3-2 showing the date when the utility commenced offering an opt-out choice.

RESPONSE:

Please refer to the response to BCUC IR 1.5.2.

Charges

1.34 Why would there be an "initial charge" for legacy meters when no change in meter or location is needed outside of the conditions where a change may be necessary due to in-service expiry?

RESPONSE:

BC Hydro has not proposed an initial charge for eligible customers that choose to retain a legacy meter. Please refer to page 1-3 of the Application.

Charges

1.35 Why would there be a full "initial charge" for the radio-off meter when the only difference between it and the no-charge, radio-on option is the decommissioning of the radio transmission feature?

RESPONSE:

The components of the initial charge for the radio-off meter option are summarized in Table 3-16 on page 3-26 of the Application. Each of the cost components is explained in section 3.4 of the Application.

Charges

1.36 Why would there be a *monthly* charge when a legacy meter typically has been read once every two months (and in some cases annually) where a customer has been on a monthly payment program that is reconciled as to actual consumption once a year? Is there to be a withdrawal of that service option for BCH customers?

RESPONSE:

Please refer to the response to CSTS IR 1.39.0 and RDCK IR 1.19.

Charges

1.37 Is it the intention of BCH to have legacy and radio-off meters read bi-monthly in some circumstances? If so, how is a monthly opt-out fee justified in that context?

RESPONSE:

It is BC Hydro's intention to read both radio-off and legacy meters bi-monthly. The charges for the Meter Choices Program will be applied according to the normal BC Hydro billing cycle. If the customer is billed bi-monthly, then the charges will be billed on a bi-monthly basis.

Charges

1.38 Under the regime contemplated by the present BCH Application, may a given customer elect to have their meter read less often so as to reduce the frequency of the proposed per-read fee? What options can be made available to customers in that regard?

RESPONSE:

No, BC Hydro customers cannot choose the frequency at which the meter at their premises is read under this application and BC Hydro does not contemplate providing customers options that would allow them to do so. Please refer to the response to BCUC IR 1.9.2.

Charges

1.39 Under the regime contemplated by the present BCH Application, may opt-out customers elect to be billed on an equal payment basis, based on the previous year's consumption patterns, with a single reading at the end of the year to confirm actual usage? Would this manner of billing reduce the per-read fee to an annual occurrence?

RESPONSE:

A Meter Choices Program customer may sign up for the Equal Payment Plan (EPP). BC Hydro will continue to read the meter on the same bi-monthly schedule as was the case prior to the deployment of Smart Metering Program. Please refer to the response to BCUC IR 1.9.5.

Charges

1.40 How would the proposed opt-out fees account for the reduced costs associated with administering the opt-out program in relation to:

a. a multi-unit dwelling where several opting-out customers share the same address while not the same account or meter?
b. a town house complex, condominium or co-op housing complex where all the residents have chosen to opt out?
c. a neighbourhood block where all the residents have chosen to opt out?
d. a customer who has more than one meter on her property (e.g. a single customer who has five meters on her property)?

RESPONSE:

Similar to other BC Hydro charges, the Meter Choices Program charges are proposed to be applied on a postage stamp basis across the service territory, wherein total costs to provide the service are divided by the appropriate number of units (in this case, the number of customers forecast to choose the particular option). In cases wherein costs may be lower due to a higher density of participants, these reduced costs will be reflected in total costs and shared by all customers participating in the Meter Choices Program. Please refer to the response to RDCK IR 1.10.

Charges

1.41 Does BCH take the position that the actual cost of physically reading each meter (that is a legacy or radio-off meter) will be uniform?

RESPONSE:

No.

Charges

1.42 Would BCH be willing to alter its proposed tariff to charge fees that relate specifically to each customer's physical meter circumstances, such as those circumstances enumerated in sub-paragraphs (a) - (d) above?

RESPONSE:

No, since such an approach would be inconsistent with the approach used to determine standard charges for other BC Hydro services. Furthermore, the complexity and effort associated with the determination of costs on a per customer basis would be extremely complex if not impossible. Please refer to the response to CSTS IR 1.40.

Charges

1.43 Please confirm that there is a discrepancy between a flat, per-meter reading fee and the possible reality that the same customer at the same address may have more than one meter or that several customers at the same address will not cause per-meter service expenses for BCH that are as great as for a single customer at a single address.

RESPONSE:

Not confirmed. Please refer to the responses to CSTS IRs 1.40 and 1.42.

Charges

1.44 Why is there a marginal cost to be recovered from opting-out customers if grid modernization is to be done in any case and grid modernization costs are (or will be) incorporated into the general operating cost of BCH's system?

RESPONSE:

The proposed Meter Choices Program charges are designed to recover the forecast costs BC Hydro will incur in relation to providing the Meter Choices Program in accordance with Direction No. 4. Costs that BC Hydro will incur in the absence of the Meter Choices Program are not included in the proposed charges.

Charges

1.45 Given that forecasting costs is admittedly very uncertain and imprecise, has BCH considered the possibility of deferring the final establishment of costs to a future point?

RESPONSE:

BC Hydro does not fully understand what is being proposed in the question, and accordingly is not able to comment.

Billing costs

1.46 Historically, what has been the annual cost associated with billing residential customers?

RESPONSE:

BC Hydro does not segregate the cost of billing customers by customer type. The annual cost associated with billing customers in the year ended March 31, 2013 was $11.1 million.

The term "annual costs associated with billing" as used in the question has been interpreted to mean the cost of generating, reviewing and distributing bills to customers. This would include fees paid to ABSBC for the review and generation of customer bills and associated costs such as postage, printing, paper and envelopes. This does not include the costs of meter reading, systems associated with managing the billing process or any internal BC Hydro labour costs.

Billing costs

1.47 Historically, what has been the annual cost associated with billing business and light industrial customers?

RESPONSE:

Please refer to the response to CSTS IR 1.46.

Billing costs

1.48 What is the expected total annual billing cost for residential customers (post smart meter installation) as determined by BCH in the context of this application?

RESPONSE:

BC Hydro does not expect customer billing costs to be materially impacted post smart meter installation in the context of this application as neither the number of customers nor the frequency of billing changes as a result of the Meter Choices Program.

BC Hydro does not segregate customer billing costs by customer type.

Billing costs

1.49 What is the expected total annual billing cost for business and light industrial customers (post-smart meter installation) as determined by BCH in the context of this application?

RESPONSE:

Please refer to the response to CSTS IR 1.48.

Electric cars

1.50 Does BCH suggest that smart meters will facilitate better service to cars powered by electricity?

RESPONSE:

Yes, the information obtained through the telecommunication networks installed as part of the SMI Program will enable BC Hydro to provide electricity service that allows for the large-scale use of electric vehicles by BC Hydro's customers. This is a requirement of paragraph 4(1)(c) of the Smart Meters and Smart Grid Regulation.

Electric cars

1.51 What makes electricity delivered via smart meters any different from electricity delivered via legacy meters or radio-off meters?

RESPONSE:

Electricity measured by smart meters is not different as compared to electricity measured by legacy or radio-off meters. Please refer to the response to CSTS IR 1.50.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.52 How is the cost of a range extender a cost attributable to providing services to an opt-out customer?

RESPONSE:

Please refer to section 3.4.1.5 of the Application.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.53 How is it that a single customer decision to opt out can affect "program costs, integration costs, and infrastructure costs"?

RESPONSE:

If smart meters were installed at 100 per cent of customer premises, there would be no program costs, investigation costs or infrastructure costs as those terms are defined in Direction No. 4 to the BCUC. Please refer to Chapter 3 of the Application for detailed information on the costs BC Hydro will incur as a result of legacy and radio-off meters remaining on the system.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.54 Have smart grid program costs, integration costs and infrastructure costs been externalized so as to be carried by individual customers, including those opting out from the smart meter program?

RESPONSE:

The Application seeks approval of new charges that have been designed to recover failed installation costs, infrastructure costs, investigation costs and program costs (as those terms are defined in Direction No. 4 to the BCUC) from the applicable customers in accordance with Direction No. 4.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.55 Apart from the context of a customer opt-out, what role do RF range extenders have in the BCH smart meter program?

RESPONSE:

Range extenders are used to extend and reinforce the Field Area Network in areas where there is insufficient density of smart meters. Range extenders function as a relay, wherein a signal is received and retransmitted.

[3] BCH Application, page 1-1, lines 22 - 25
[4] BCH Application, page 1-2, lines 14 - 15

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.56 Can the BCH smart meter program operate without the use of RF range extenders?

RESPONSE:

BC Hydro will not achieve the anticipated benefits of the SMI Program without the use of range extenders.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option. [3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises. [4]

1.57 Apart from the context of a customer opt-out, will the BCH smart meter program utilize RF range extenders? If so, how many units will be utilized and in what context will they be deployed?

RESPONSE:

Range extenders have always been part of the Field Area Network design. The initial design, which did not contemplate the Meter Choices Program, called for the implementation of about 2,100 range extenders.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.58 Where BCH installs an RF range extender in order to fill a "gap" created by a given customer's opt-out choice, how much distance will there be between that RF range extender and the residential dwelling of the given customer? Will BCH commit to a minimum distance in that regard?

RESPONSE:

The distance is uncertain, as it depends on the results of a site survey which assesses the mesh network, topology, and the optimal location for the range extender. BC Hydro does not commit to a minimum distance from a customer's dwelling.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.59 What is the power density output of an RF range extender at various given distances?

RESPONSE:
The range extender has the same radio as BC Hydro's smart meter. The majority of the range extenders are mounted on BC Hydro poles 18 to 24 feet above ground (i.e., 550 to 730 cm above ground).

Radio Frequency Power Density at Different Distances from Range Extender		
Distance (cm)	**Power Density** $(\frac{\mu W}{cm^2})$	**Percent of Health Canada Safety Code 6 (%)**
300	**0.010**	**0.002**
500	**0.004**	**0.001**
750	**0.002**	**0.0003**
1000	**0.001**	**0.0002**

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.60 Is the cost of the RF range extender a cost of reading an opt-out customer's meter?

RESPONSE:

No. Please refer to section 3.4.1.5 of the Application.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.61 Is the cost of the RF range extender a cost of providing power to an opt-out customer?

RESPONSE:

No. Please refer to section 3.4.1.5 of the Application.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.62 Why should an opt-out customer pay for the communication infrastructure of the smart meter program in which he/she is not participating?

RESPONSE:

Pursuant to section 3(1)(a)(i) of Direction No. 4 to the BCUC, "infrastructure costs" are to be recovered from eligible customers where a legacy or radio-off meter is installed at their premises. The cost of additional range extenders is an "infrastructure cost" and is incurred because of those customers who choose a legacy or radio-off meter. Please also refer to section 3.4.1.5 of the Application.

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Range extenders

BCH states:

The Government of British Columbia has decided that BC Hydro will offer new meter options and related services to eligible customers who choose not to have a smart meter installed at their premises, and that eligible customers choosing an alternative meter option will have to pay additional charges designed to recover the costs attributable to providing services in relation to the option.[3]

BCH further states:

The additional charges are designed to recover the forecast costs of providing services to customers in relation to their choice to have radio-off meters installed at their premises.[4]

1.63 What is the per unit cost of an RF range extender and the field cost for overcoming the difficulty created by the customers estimated to be radio-off and legacy meter customers?

RESPONSE:

Schedule A-7a of Appendix I indicates the following costs for an installed range extender. Note that in some circumstances the addition of a transformer, and/or a new pole is required. The incidence of each configuration for installed range extenders at the time of the analysis was used as weights in the determination of the weighted average costs. On a weighted average basis, the installed cost is $3,528.

Weighted Average Cost per Range Extender		
	Cost ($)	Incidence (%)
Cost Per Range Extender		
Range Extender Only	1,216	16.0
Range Extender + Transformer	3,250	81.0
Range Extender + Transformer + Single Phase Pole	6,689	3.0
	Weighted Average	
Expected Cost of Range Extender Implementation ($)	3,028	
GIS, Design and Site Survey	500	
Total Expected Cost of Range Extender Implementation ($)	3,528	

[3] BCH Application, page 1-1, lines 22 – 25.
[4] BCH Application, page 1-2, lines 14 – 15.

Failed installation charges

1.64 Can the costs associated with failed installations be avoided by honouring a customer's express refusal to allow the installation of a smart meter on his or her property?

RESPONSE:

Where a customer who is eligible for the Meter Choices Program elects or is deemed to elect the legacy meter option, BC Hydro would not attend at the customer's premises to exchange the meter installed there except when the legacy meter seal expires, the meter breaks or the customer elects to have the meter changed to a radio-off or smart meter. There would be no attempted installation, and therefore no failed installation or failed installation cost, where the eligible customer elects or is deemed to elect to retain the legacy meter, and the meter is functioning properly with a valid seal.

Failed installation charges

1.65 Does BCH take the position that it is entitled, according to the terms of the current tariff, to install a microwave emitting smart meter at a customer's property and attend the property for that purpose? If so, why is BCH applying to amend the current tariff? If not, then on what basis did BCH install smart meters on the properties of customers who explicitly indicated their refusal by way of correspondence to BC Hydro or conspicuous signage on their former analogue meters?

RESPONSE:

No. Pursuant to the BC Hydro Electric Tariff as amended by BCUC Order No. G-166-13 in accordance with Direction No. 4 to the BCUC, where an eligible customer elects or is deemed to elect the legacy or radio-off meter option BC Hydro will not install a smart meter at the customer's premises.

With respect to the question about smart meter deployment prior to the Meter Choices Program, BC Hydro declines to provide the requested information on the basis that is not relevant to the scope of this proceeding.

Failed installation charges

1.66 Will BCH refrain from making chargeable visits to customers who have formally elected to opt out by either keeping their legacy meter or by requesting a radio-off meter?

RESPONSE:

BC Hydro does not understand what is meant by the term "chargeable visits", and therefore is unable to answer the question.

Failed installation charges

1.67 Will BCH be forgoing the enforcement of the failed installation charge for all customer visits prior to November 15, 2013? If not, why not?

RESPONSE:

The failed installation charge came into effect as of October 25, 2013 and applies from that date forward.

Failed installation charges

1.68 Will BCH charge a failed installation charge to customers who, at the material time, had explicitly indicated their refusal by way of correspondence to BC Hydro or conspicuous signage on their former analogue meters?

RESPONSE:

Please refer to the response to CSTS IR 1.64.

Failed installation charges

1.69 The proposed failed installation charge will apply to failed installations as of when?

RESPONSE:

The failed installation charge came into effect as of October 25, 2013 and applies from that date forward.

Moves

1.70 When an opt-out customer moves, will he or she be able to continue to opt out at his or her new premises? Will a new set-up fee apply?

RESPONSE:

Please refer to sections 4.2.3(d) and (e), and 4.2.4(b) and (c) of the BC Hydro Electric Tariff for the terms and conditions applicable to eligible customers that move to a new premises. An eligible customer that moves to a new premises may elect to have a radio-off meter installed at the new premises or retain the smart meter installed there. If the customer elects the radio-off option, an initial charge would apply.

Travel time

1.71 What alternatives has BCH explored to having vehicles travel to the premises of each opt-out customer?

RESPONSE:

BC Hydro is unaware of any practical alternatives to using a vehicle to travel to a customer's premises to read the meter of a customer who chooses to participate in the Meter Choices Program. Please also refer to the response to BCUC IR 1.9.2.

Travel time

1.72 Would it be possible for opt-out customers to use a USB memory stick or some other device to download radio-off meter data and send such data to BCH over the internet? If not, why not?

RESPONSE:

This is not possible, since access to the radio-off meter data requires the appropriate hardware and software, together with the security authorizations required for access. Providing customers with such tools and authorizations to enable them to access radio-off meter data would compromise security and privacy protocols for all smart meters.

Travel time

1.73 Will the BCH radio-off and legacy meters have a glass face through which consumption data can be seen and photographed? Can such a photograph be emailed by a customer to BCH so as to communicate consumption data at any given time? Would BCH be able to audit such a practice of customer self-reporting? What would the costs of such a program be?

RESPONSE:

Yes, radio-off and legacy meters all have a display through which consumption will be visible and could be photographed. Please refer to the response to BCUC IR 1.9.2. Costs of such a program have not been assessed.

Meter readers

1.74 Apart from the proposed opt-out program, does BCH plan to employ field meter readers?

RESPONSE:

Please refer to the response to CEC IR 1.39.7.

The cost of turning radios off

1.75 Can the cost of turning radios off (for opt-out customers) be reduced by specifying to the equipment provider that a number of new meters be delivered to BCH in a radio-off configuration?

RESPONSE:

A special order of a relatively small number of customized meters would likely be more expensive than using the meters that BC Hydro already has and configuring them to deactivate the radio components.

The cost of turning radios off

1.76 Can the cost of turning radios off (for opt-out customers) be reduced by having BCH turn those radios off before they are installed at customer residences?

RESPONSE:

Please refer to the response to BCSEA IR 1.9.6.

Opt-out revenue

1.77 Can BCH confirm what revenue it will derive in opt-out fees on the basis of likely radio-off and legacy customers?

RESPONSE:

Estimated revenues for Meter Choices Program participation levels of 5,000, 10,000, 15,000, and 20,000 customers, at the charges for each level, is provided in Table 3-14 of the Application under the row heading "Total Revenues ($)."

Other utilities

1.78 Do any jurisdictions and/or utilities worldwide provide their customers with an option to opt out without having to pay a fee in relation to the opt-out?

RESPONSE:

Direction No. 4 to the BCUC requires charges for eligible customers that elect or are deemed to elect the legacy or radio-off meter option. Accordingly, BC Hydro declines to provide the requested information on the basis that is not relevant to the scope of this proceeding.

Other utilities

1.79 Do any jurisdictions and/or utilities worldwide provide their customers with an option to opt out by payment of a fee that is less than that proposed by BCH in the present Application?

RESPONSE:

Yes. Please refer to Table 3-2 of the Application.

Other utilities

1.80 Is the legality and/or implementation of an opt-out fee pending or subject to regulatory approval in any jurisdiction worldwide?

RESPONSE:

BC Hydro does not have the requested information.

Other utilities

1.81 Can you confirm that utilities in New Mexico, Eugene and Ashland allow for an opt-out without fee?

RESPONSE:

BC Hydro is not aware whether and if so why utilities in the noted jurisdictions allow customers to opt-out without a fee. BC Hydro's Application is designed to fulfill the requirements of Direction No. 4 to the BCUC.

Other utilities

1.82 What are the features of the opt-out program in Quebec?

RESPONSE:

Table 3-2 of the Application provides some information on the Hydro Quebec smart meter opt-out program. However, the terms and conditions of the smart meter opt-out program in Quebec are not relevant to this proceeding because the terms and conditions of BC Hydro's Meter Choices Program have been prescribed by Direction No. 4 to the BCUC.

Other utilities

1.83 What opt-out fee is being sought by the utility in Kauai?

RESPONSE:

BC Hydro does not have the requested information.

Special customers

1.84 Under the regime contemplated by the present BCH Application, will BCH waive the opt-out fee for customers who suffer from a disability that prevents them from accessing environments where exposure to radio-frequency emissions is ongoing and incessant?

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

Special customers

1.85 Under the regime contemplated by the present BCH Application, will BCH waive the opt-out fee for customers who are under some degree of financial hardship?

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

Nature of data

1.86 Where data is manually downloaded from radio-off meters, what data (besides usage information) is being collected and how is such data useful to BCH if it is not collected in real time?

RESPONSE:

Aside from usage information, the following information will be collected from radio-off meters:

1. **Meter events, including power outages, power restorations, meter inversions, and meter tampers**

2. **Meter events, associated with distribution system safety, operation and monitoring including high and low voltage events and unauthorized delivery of power to BC Hydro**

3. **Actual service voltage and wattage, associated with distribution system operation and monitoring**

The timely collection and analysis of this data is required to protect against lost revenue and to insure that the distribution system is operating safety and reliably.

BCH Application – Chapter 3 - Meter Choice Program Costs – page 3-9; Table 3-4; "Radio-Off Information Technology Capital Costs"

1.87 BCH presents this as a non-variable total cost of $1,238,577 regardless of numbers of opt-out customers.

RESPONSE:

No question identified.

BCH Application – Chapter 3 - Meter Choice Program Costs – page 3-9; Table 3-4; "Radio-Off Information Technology Capital Costs"

1.88 Is this an annual cost or a one-time setup cost? If it is an annual cost in part, what proportion is variable?

RESPONSE:

The figures in Table 3-4 of the Application reflect one-time setup costs. Note that the title of Table 3-4 should read "Meter Choices Program Information Technology Capital Costs."

BCH Application – Chapter 3 - Meter Choice Program Costs – page 3-9; Table 3-4; "Radio-Off Information Technology Capital Costs"

1.89 If it is all or in a large part a one-time cost, why would it not be better to include it in the general rate-base?

RESPONSE:

These costs are to be recovered from customers who choose or are deemed to choose the legacy or radio-off meter option in accordance with Direction No. 4 to the BCUC.

From: Annette & John Hurd [ajhurd@telus.net]
Sent: Wednesday, November 6, 2013 2:34 PM
To: Commission Secretary BCUC:EX
Subject: Re: Intervenor request - Meter Choices Program Application

November 6th, 2013

Attention: Ms. Erica Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms Hamilton,

My request is as follows;

1.) I would like BC Hydro to supply me the details and financial information that justifies a $35 per month additional charge for a Legacy meter to a homeowner but in particular to an apartment renter who currently pays $19/month for their service and which is read every two months. Exactly what costs will BC Hydro incur which is over and above what they already charge to read a Legacy meter? In addition, what have they done to mitigate any of these costs? Have they given any consideration to the hardship they are creating for those low income individuals and if so exactly what and how?

2.) BC Hydro has also applied or will be applying for a rate increase to pay for the $1 billion they spent on smart meters. If homeowners and individuals renting apartments have to pay a special levy to keep their Legacy meters which is designed to cover the additional costs of keeping those meters then they should not be obliged to also pay for a rate increase designed to pay for the additional costs of smart meters. Has Hydro addressed this and if so could they please please explain how they intend to do so in a fair and equitable manner.

3.) BC Hydro has applied for an interim charge of $35 for those who want to keep a Legacy meter. However, it would seem their intention is to make a request for a fee (knowing their request for an interim fee would be rubber stamped and approved by the BCUC without nay public consultation as is their normal practice for a rate increase) of this size is intended to be so punitive to those hundreds of individuals living in apartment buildings or have very low usage rates as to force those individuals who are simply unable to absorb an effective increase that amounts to THREE times what they currently pay to acquiesce and agree to the installation of a smart meter. This essentially makes the entire BCUC hearing irrelevant to these people and amounts to a heavy handed, bullying and coercive tactic on the part of BC Hydro. I would like BC HYDRO to advise me of what their current corporate social and moral standards are and how they intend to address this injustice. I would also like them to advise exactly how they are a good socially responsible corporation and how their actions with respect to these charges are socially responsible.

Regards
John

1.0 I would like BC Hydro to supply me the details and financial information that justifies a $35 per month additional charge for a Legacy meter to a homeowner but in particular to an apartment renter who currently pays $19/month for their service and which is read every two months. Exactly what costs will BC Hydro incur which is over and above what they already charge to read a Legacy meter? In addition, what have they done to mitigate any of these costs? Have they given any consideration to the hardship they are creating for those low income individuals and if so exactly what and how?

RESPONSE:

Chapter 3 of the Application provides a discussion of the Meter Choices Program costs. The cost model provided in Appendix I of the Application includes the detailed calculations underlying the proposed charges. All costs are estimated on an incremental basis, and in BC Hydro's view these cost estimates are reasonable. The proposed charges are aligned to the forecast costs BC Hydro will incur as a result of providing the program, and to Direction No. 4 to the BCUC.

The Meter Choices Program provides eligible customers with alternative meter installation options. The costs to provide these options are the basis for the proposed fees. The financial circumstances of individuals who may choose to participate in the program cannot be considered in the cost analysis and the proposed charges.

Please also refer to the response to Polden IR 1.3.2.

2.0 BC Hydro has also applied or will be applying for a rate increase to pay for the $1 billion they spent on smart meters. If homeowners and individuals renting apartments have to pay a special levy to keep their Legacy meters which is designed to cover the additional costs of keeping those meters then they should not be obliged to also pay for a rate increase designed to pay for the additional costs of smart meters. Has Hydro addressed this and if so could they please please explain how they intend to do so in a fair and equitable manner.

RESPONSE:

Approximately $70 million of financial benefits resulting from the implementation of the SMI Program, including reduced operating costs and increased revenues from theft detection, are being shared across all customers in the form of reduced rates from F2012-F2014, including for those customers who choose a legacy or radio-off meter.

3.0 BC Hydro has applied for an interim charge of $35 for those who want to keep a Legacy meter. However, it would seem their intention is to make a request for a fee (knowing their request for an interim fee would be rubber stamped and approved by the BCUC without nay public consultation as is their normal practice for a rate increase) of this size is intended to be so punitive to those hundreds of individuals living in apartment buildings or have very low usage rates as to force those individuals who are simply unable to absorb an effective increase that amounts to THREE times what they currently pay to acquiesce and agree to the installation of a smart meter. This essentially makes the entire BCUC hearing irrelevant to these people and amounts to a heavy handed, bullying and coercive tactic on the part of BC Hydro. I would like BC HYDRO to advise me of what their current corporate social and moral standards are and how they intend to address this injustice. I would also like them to advise exactly how they are a good socially responsible corporation and how their actions with respect to these charges are socially responsible.

RESPONSE:

BC Hydro believes the charges it has proposed in the Application are in accordance with the requirements of Direction No. 4 to the BCUC, a copy of which is included with the Application as Appendix B.

From: Roger Middleton [roger.middleton@telus.net]
Sent: Tuesday, November 5, 2013 11:54 AM
To: Commission Secretary BCUC:EX
Subject: Fw: Smart Meter Choices Program

Re BC Hydro's Submission

Questions on Pricing

In determining the level of charges to be applied to opt out customers, has the Commission considered the net benefit BC Hydro will derive from the fact that these customers will be paying peak prices 24/7 once the off-peak pricing option is introduced to customers with operative digital meters?

Further to the above question, should BC Hydro seek and receive permission to eliminate Step 1 pricing, once the off-peak pricing option is available, BC Hydro would then receive an additional benefit from customers who opt out. Has the Commission taken this possibility into account?

Questions on Costs

S. 3.4.1. Capital costs

See questions for sub-sections below.

S. 3.4.1.2 Information Technology Integration

As the system is already working in parallel, with collectors still being installed in many rural areas, software and systems required to merge manually read and digitally collected data must already be in place. If this is correct, then to charge again for these requirements is to double charge RF-off and analogue meter customers.

Why then has BC Hydro included IT charges again for RF off and analogue meter users?

Why should existing software be upgraded to manage RF-Off and analogue meter customers when the existing system works just fine?

S. 3.4.1.3 Manual Meter Download Handheld Units

Why is new tablet meter reading equipment required for RF-off digital and analogue meters when both are manually read and given that existing hand held units are perfectly capable of carrying out this function?

Is it really necessary to standardize everything to the highest technical standard? Commonsense argues that "appropriate technology" be employed.

S. 3.4.1.4 Additional Check Meters - Theft Detection

Are not check meters already being deployed? If so, they should already be in place. If not, there must be a more logical way to determine theft location.

If a hard-wired digital meter option was to be offered in rural environments, would not additional check meters be unnecessary?

S. 3.4.1.5 Additional Telecom Equipment

BC Hydro proposes to use whichever option works best for transmitting data from collectors to base. See:

http://www.bchydro.com/energy-in-bc/projects/smart_metering_infrastructure_program/smart_meter_and_grid_technology/how_smart_meter_work.html

How Do Smart Meters Work?

In which BC Hydro says:

Information is sent do BC Hydro through existing infrastructure

"The fully protected data is sent from the collector to BC Hydro using existing communication infrastructure, such as **DSL landline, cellular or satellite**.

A Digital Subscriber Line (DSL) is a family of technologies that provides digital transmission over the wires of a local telephone network.

This design ensures that data is sent in the most cost-effective way."

So, it is fine for BC Hydro to give themselves a hard-wired option, where circumstances make it the most cost-effective option. Why did they not consider doing the same for their customers?

If the hard-wired meter approach was adopted for rural, hilly/mountainous locations, would not range extenders be unnecessary?

S. 3.4.2. Operating Costs

S. 3.4.2.1 Account Processing Costs

Is this account charge being applied to all customers or just those with RF-off digital and analogue meters? If it is being charged across the board, then it is an item already accounted for in the pricing of electricity sold to all customers.

S. 3.4.2.2 Radio-Off Meter Deployment

Why should rural and suburban customers in low density suburban locations have to pay this fee when the better option would have been to install hard-wired technology in these locales?

S. 3.4.2.3 Training and Transition to Operations

BC Hydro already has agents that have been trained in handling customer enquiries. Why do we need to have new agents when experienced agents are on hand?

S. 3.4.2.4 IT Support and Maintenance

See comments and questions under S. 3.4.1.2 above.

S. 3.4.2.5 Analogue Meter Exchange - Meter Seal Expiry

The reality is that analogue meters are analogue meters. Renaming them "legacy" meters does nothing to bring clarity to this discussion. Why is BC Hydro changing language in this way?

It should be expected that digital meters will also have regulations applied by Measurement Canada that are similar to those that have applied to analogue meters. Will not this charge be common to all meters, be they analogue or digital?

If so, is it not already included in the cost structure determining the price we all pay for electrical power?

S. 3.4.2.6 Additional Field Investigation Resources

In many rural locations, the very low density of customers would make the installation of an RF mesh network system prohibitive. Why not provide the hard-wired digital alternative?

Are check meters or some kind of surveillance system not already being used in rural areas?

S. 3.4.2.7 Manual Meter Reading

BC Hydro already has handheld meter readers into which the meter reader can enter data. Why are hi-tech, sophisticated tablet computers using a special optical probe required?

Why do analogue and RF-off digital meters need to be read every two months?

I, along with many others, have been regularly emailing readings to Hydro's customer service, and this system has worked well. Why has BC Hydro has chosen to cancel their email address so that this meter reading method can no longer be used?

The option to switch to estimated monthly readings is still available. Both the former and the latter ways of recording meter readings only require one or two manual reads a year. What is wrong with these methods to record power useage?

General Questions

Were alternative digital metering systems explored on feasability, cost and benefit basis? If so, what were the findings and is this report in the public domain?

Why did BC Hydro decide to standardize on RF Mesh Network technology?

1.0 Questions on Pricing

1.1.1 In determining the level of charges to be applied to opt out customers, has the Commission considered the net benefit BC Hydro will derive from the fact that these customers will be paying peak prices 24/7 once the off-peak pricing option is introduced to customers with operative digital meters?

RESPONSE:

No. BC Hydro has no plans to introduce time-of-use pricing for residential customers, and BC Hydro believes that consideration of time-of-use pricing is not within the scope of this proceeding.

1.0 Questions on Pricing

1.1.2 Further to the above question, should BC Hydro seek and receive permission to eliminate Step 1 pricing, once the off-peak pricing option is available, BC Hydro would then receive an additional benefit from customers who opt out. Has the Commission taken this possibility into account?

RESPONSE:

No. BC Hydro has no plans to introduce time-of-use pricing for residential customers, and BC Hydro believes that consideration of time-of-use pricing is not within the scope of this proceeding.

2.0 Section 3.4.1. Capital costs
Section 3.4.1.2 Information Technology Integration

As the system is already working in parallel, with collectors still being installed in many rural areas, software and systems required to merge manually read and digitally collected data must already be in place. If this is correct, then to charge again for these requirements is to double charge RF-off and analogue meter customers.

1.2.1 Why then has BC Hydro included IT charges again for RF off and analogue meter users?

RESPONSE:

Cost estimates for IT Integration have been estimated on an incremental basis. These costs arise as a result of the Meter Choices Program, and there is no resulting duplication of costs.

2.0 Section 3.4.1. Capital costs
Section 3.4.1.2 Information Technology Integration

As the system is already working in parallel, with collectors still being installed in many rural areas, software and systems required to merge manually read and digitally collected data must already be in place. If this is correct, then to charge again for these requirements is to double charge RF-off and analogue meter customers.

1.2.2 Why should existing software be upgraded to manage RF-Off and analogue meter customers when the existing system works just fine?

RESPONSE:

The IT system which is now in place needs to be modified to accommodate the ongoing presence of legacy meters and radio-off meters on the system. These changes and modifications to the system are discussed in section 3.4.1.2 of the Application.

3.0 Section 3.4.1. Capital costs
Section 3.4.1.3 Manual Meter Download Handheld Units

1.3.1 Why is new tablet meter reading equipment required for RF-off digital and analogue meters when both are manually read and given that existing hand held units are perfectly capable of carrying out this function?

RESPONSE:

The handheld units used by meter readers prior to the implementation of the SMI Program do not have the capability to download data from radio-off meters and are no longer being used because they have reached their end of life. As part of the Smart Metering Program, new tablet devices were implemented for the purposes of data download from smart meters. As a result of the Meter Choices Program, additional Field Metering Analysts (FMAs) are required in the field and each FMA requires a tablet device because FMAs are required to read all meter types.

3.0 Section 3.4.1. Capital costs
Section 3.4.1.3 Manual Meter Download Handheld Units

1.3.2 Is it really necessary to standardize everything to the highest technical standard? Commonsense argues that "appropriate technology" be employed.

RESPONSE:

Please refer to the response to Middleton IR 1.3.1.

4.0 Section 3.4.1. Capital costs
Section 3.4.1.4 Additional Check Meters - Theft Detection

1.4.1 Are not check meters already being deployed? If so, they should already be in place. If not, there must be a more logical way to determine theft location.

RESPONSE:

Some check meters were in place prior to the deployment of smart meters. These meters are meant to be installed on a temporary basis and are moved around the system to areas of investigation.

Please also refer to the responses to BCUC IRs 1.10.1, 1.10.2, and 1.10.3.

4.0 Section 3.4.1. Capital costs
Section 3.4.1.4 Additional Check Meters - Theft Detection

1.4.2 If a hard-wired digital meter option was to be offered in rural environments, would not additional check meters be unnecessary?

RESPONSE:

In BC Hydro's view, the use of field investigation resources combined with check meters is the most cost-effective approach.

5.0 Section 3.4.1. Capital costs
Section 3.4.1.5 Additional Telecom Equipment

BC Hydro proposes to use whichever option works best for transmitting data from collectors to base. See:

http://www.bchydro.com/energy-in-bc/projects/smart_metering_infrastructure_program/smart_meter_and_grid_technology/how_smart_meter_work.html

How Do Smart Meters Work?

In which BC Hydro says:

Information is sent do BC Hydro through existing infrastructure

"The fully protected data is sent from the collector to BC Hydro using existing communication infrastructure, such as **DSL landline, cellular or satellite**.

A Digital Subscriber Line (DSL) is a family of technologies that provides digital transmission over the wires of a local telephone network.

This design ensures that data is sent in the most cost-effective way."

1.5.1 So, it is fine for BC Hydro to give themselves a hard-wired option, where circumstances make it the most cost-effective option. Why did they not consider doing the same for their customers?

RESPONSE:

The excerpt is taken out of context.

Smart meters transmit data through the field area network wirelessly. Once the data reaches the collector, it will be sent back to BC Hydro using locally available infrastructure in the area. The connection from the collector to BC Hydro is the backhaul. In most of the province, BC Hydro is using wireless cellular backhaul.

5.0 Section 3.4.1. Capital costs
Section 3.4.1.5 Additional Telecom Equipment

BC Hydro proposes to use whichever option works best for transmitting data from collectors to base. See:

http://www.bchydro.com/energy-in-bc/projects/smart_metering_infrastructure_program/smart_meter_and_grid_technology/how_smart_meter_work.html

How Do Smart Meters Work?

In which BC Hydro says:

Information is sent do BC Hydro through existing infrastructure

"The fully protected data is sent from the collector to BC Hydro using existing communication infrastructure, such as **DSL landline, cellular or satellite**.

A Digital Subscriber Line (DSL) is a family of technologies that provides digital transmission over the wires of a local telephone network.

This design ensures that data is sent in the most cost-effective way."

1.5.2 If the hard-wired meter approach was adopted for rural, hilly/mountainous locations, would not range extenders be unnecessary?

RESPONSE:

The meter options available under the Meter Choices Program are specified in Direction No. 4 to the BCUC. Hard-wired meters would not meet the definition of radio-off meter in the Direction.

6.0 Section 3.4.2. Operating Costs
Section 3.4.2.1 Account Processing Costs

1.6.1 Is this account charge being applied to all customers or just those with RF-off digital and analogue meters? If it is being charged across the board, then it is an item already accounted for in the pricing of electricity sold to all customers.

RESPONSE:

Customers who enroll in the Meter Choices Program will not be charged the Customer Account Processing cost directly. It is included in the standard charges for the Meter Choices Program, and reflects the incremental cost to BC Hydro of enrolling a customer into the program. These costs are not already included in the price of electricity.

7.0 Section 3.4.2. Operating Costs
Section 3.4.2.2 Radio-Off Meter Deployment

1.7.1 Why should rural and suburban customers in low density suburban locations have to pay this fee when the better option would have been to install hard-wired technology in these locales?

RESPONSE:

The meter options available under the Meter Choices Program are specified in Direction No. 4 to the BCUC. Hard-wired meters would not meet the definition of radio-off meter in the Direction.

8.0 Section 3.4.2. Operating Costs
Section 3.4.2.3 Training and Transition to Operations

1.8.1 BC Hydro already has agents that have been trained in handling customer enquiries. Why do we need to have new agents when experienced agents are on hand?

RESPONSE:

These costs reflect the training and transition costs for new systems and processes which have been implemented as a result of the Meter Choices Program. Thus, these costs are incremental and can therefore be attributed to the provision of the program.

9.0 Section 3.4.2. Operating Costs
Section 3.4.2.4 IT Support and Maintenance

As the system is already working in parallel, with collectors still being installed in many rural areas, software and systems required to merge manually read and digitally collected data must already be in place. If this is correct, then to charge again for these requirements is to double charge RF-off and analogue meter customers.

1.9.1 Why then has BC Hydro included IT charges again for RF off and analogue meter users?

RESPONSE:

IT Maintenance and Support refers to the cost for supporting and maintaining the incremental IT Integration required for the Meter Choices Program.

9.0 Section 3.4.2. Operating Costs
Section 3.4.2.4 IT Support and Maintenance

As the system is already working in parallel, with collectors still being installed in many rural areas, software and systems required to merge manually read and digitally collected data must already be in place. If this is correct, then to charge again for these requirements is to double charge RF-off and analogue meter customers.

1.9.2 Why should existing software be upgraded to manage RF-Off and analogue meter customers when the existing system works just fine?

RESPONSE:

Please refer to the response to Middleton IR 1.2.2.

10.0 Section 3.4.2. Operating Costs
Section 3.4.2.5 Analogue Meter Exchange - Meter Seal Expiry

1.10.1 The reality is that analogue meters are analogue meters. Renaming them "legacy" meters does nothing to bring clarity to this discussion. Why is BC Hydro changing language in this way?

RESPONSE:

The definition of "legacy meter" as used in Direction No. 4 to the BCUC is "an electricity meter, other than a smart meter or a radio-off meter, that is of a type in use by the authority". BC Hydro uses both analog and digital meters (that are not a smart meter or a radio-off meter). Analog meter is too narrow a term to include the digital meters in use by BC Hydro.

10.0 Section 3.4.2. Operating Costs
Section 3.4.2.5 Analogue Meter Exchange - Meter Seal Expiry

1.10.2 It should be expected that digital meters will also have regulations applied by Measurement Canada that are similar to those that have applied to analogue meters. Will not this charge be common to all meters, be they analogue or digital?

RESPONSE:

The new smart meters and radio-off meters have a ten-year Measurement Canada seal and will not need to be exchanged during this period in relation to the seal. The costs identified in section 3.4.2.5 of the Application are for legacy to legacy meter exchanges due to expired seals and are accordingly incremental costs attributable to legacy meters remaining in service.

Please also refer to the response to Ryder IR 1.14.2.

10.0 Section 3.4.2. Operating Costs
Section 3.4.2.5 Analogue Meter Exchange - Meter Seal Expiry

1.10.3 If so, is it not already included in the cost structure determining the price we all pay for electrical power?

RESPONSE:

Please refer to the response to Middleton IR 1.10.2.

11.0 Section 3.4.2. Operating Costs
Section 3.4.2.6 Additional Field Investigation Resources

1.11.1 In many rural locations, the very low density of customers would make the installation of an RF mesh network system prohibitive. Why not provide the hard-wired digital alternative?

RESPONSE:

The meter options available under the Meter Choices Program are specified in Direction No. 4 to the BCUC. Hard-wired meters would not meet the definition of radio-off meter in the Direction.

11.0 Section 3.4.2. Operating Costs
Section 3.4.2.6 Additional Field Investigation Resources

1.11.2 Are check meters or some kind of surveillance system not already being used in rural areas?

RESPONSE:

Check meters are devices that are installed on a temporary basis to determine the amount of energy that is being transmitted on a particular line. Some check meters were used prior to the implementation of the SMI Program. Please also refer to the response to BCUC IR 1.10.1.

12.0 Section 3.4.2. Operating Costs
Section 3.4.2.7 Manual Meter Reading

1.12.1 BC Hydro already has handheld meter readers into which the meter reader can enter data. Why are hi-tech, sophisticated tablet computers using a special optical probe required?

RESPONSE:

Please refer to the response to Middleton IR 1.3.1.

12.0 Section 3.4.2. Operating Costs
Section 3.4.2.7 Manual Meter Reading

1.12.2 Why do analogue and RF-off digital meters need to be read every two months?

RESPONSE:

Please refer to the response to BCUC IR 1.9.2.

12.0 Section 3.4.2. Operating Costs
Section 3.4.2.7 Manual Meter Reading

1.12.3 I, along with many others, have been regularly emailing readings to Hydro's customer service, and this system has worked well. Why has BC Hydro has chosen to cancel their email address so that this meter reading method can no longer be used?

RESPONSE:

BC Hydro does not encourage the submission of self-reporting of meter reads and will only use such information in the manner outlined in the response to BCUC IR 1.9.2.

The email channel service review is an unrelated initiative. In an effort to improve service efficiency, BC Hydro has cancelled unstructured, unencrypted direct email requests and is migrating to automated and secure 24 x 7 web self-service and structured web forms, which will not have the ability to accept self-reporting of meter reads.

12.0 Section 3.4.2. Operating Costs
Section 3.4.2.7 Manual Meter Reading

1.12.4 The option to switch to estimated monthly readings is still available. Both the former and the latter ways of recording meter readings only require one or two manual reads a year. What is wrong with these methods to record power useage?

RESPONSE:

Please refer to the response to BCUC IR 1.9.2.

13.0 General Questions

1.13.1 Were alternative digital metering systems explored on feasability, cost and benefit basis? If so, what were the findings and is this report in the public domain?

RESPONSE:

BC Hydro used an open, competitive procurement process to select the new metering system and did not specify either a wired or a wireless technology solution. None of the vendors proposed a wired option for the Smart Metering Program.

13.0 General Questions

1.13.2 Why did BC Hydro decide to standardize on RF Mesh Network technology?

RESPONSE:

Please refer to the response to Middleton IR 1.13.1.

Date: **6 November 2013**

Intervenor Name: **Rodney Polden**

Information Requested From: **BC Hydro**

BCUC Hearing: **Meter Choices Program**

1 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1 Is this the case with all BC Hydro customer groups?

1.2 Consequently, will BC Hydro be seeking to ensure that the entire cost of e.g . the Site C project is covered by those commercial customers (and no doubt others) who will make up its principal customer group? Please provide relevant documentation, if this is so.

1.3 If the above is not so, please confirm that, in fact, that principle does **not** apply elsewhere uniformly throughout BC Hydro's operations.

1.4 Please consequently confirm that it has, in the case of the opt-out program, in fact been applied selectively and for a specific purpose, and explain why the small group of customers seeking to retain their analog meters for reasons of their health, safety and privacy are treated in a different fashion from the treatment extended to, say, large commercial customers.

1.5 Please provide supporting documentation that shows the calculations and case for why this makes better business sense.

1.6 Alternatively please explain the actual rationale for using the principle in the current situation, and provide documentation that will disprove the widely held notion that is often encountered when members of the public are asked why they think Hydro is charging such high fees for the opt-out program – namely that "it is to punish dissenters and coerce consent to smart meters".

1.7 If BC Hydro has been applying this principal (full program cost recovery from its customer group) all along, please provide documentation of at least two other programs (beyond the Smart Meter Choices program) and specify their relevant customer groups, where this principle **has** been followed.

1.8 Please also provide documentation of at least an equal number of programs in which the principle has **not** been the mandated course. If such other programs cannot be found (i.e. the policy of "cost recovery from the particular customer group" is always followed), please confirm that it will in future and in all cases be the uniform policy of BC Hydro that every project and program must recover its costs from its customer group, rather than from general revenue.

2 The issue of "fairness"

2.1 There are numerous reports currently appearing of the fires and explosions that have either been happening recently to smart meters or possibly been caused by them – most recently the case of some 60 or 70 smart meters that exploded last week on Eureka Street in Forest, Ontario, resulting in power being shut down for more than a day. Since

obviously, in the future when we may start to see smart meters involved in these kinds of incidents occurring here in BC (as they have been elsewhere in many countries), BC Hydro may be needing to incorporate the 'collateral damage' costs of employing smart meters into the electricity bills of everyone who accepted a smart meter, please confirm that BC Hydro will out of "fairness" be providing a rebate or appropriate reduction of fees to all those of us who have assisted Hydro in avoiding these foreseeable costs by our choice to retain the generally proven, reliable, safe and well-advanced technology of analog and/or digital meters.

2.2 Since the issue at hand in relation to this application is that of the "fairness" of the cost recovery that the opt-out group of customers is being asked to bear, please confirm that all costs associated with the program to install smart meters throughout the province will be borne **only** by those with smart meters, including all related costs of infrastructure changes and so on, and that those costs will **not** be levied against those of us outside the customer group of smart metered utility customers.

2.3 If this is not the case, and no rebate to opt-out customers will apply for the costs that our choices will have saved Hydro from incurring, but only charges to opt-outs will apply for the costs they claim that our choices have incurred, please explain why it's "fair" one way round, but not "fair" the other way round.

2.4 Please provide documentation that shows how the issues particularly of "fairness" of charges for the opt-out program were initially planned for, in the policy development stage of the smart meter installation program.

2.5 If no documentation is available to show such planning, please confirm that the initial planning process was in fact flawed, since most other regional utilities who have previously gone through this smart meter introduction process have either prudently taken account of the need for an opt-out program initially at an early stage, or else soon discovered from the widespread dissatisfaction and resistance among the target population the resulting need to offer an opt-out.

2.6 If Hydro does not accept that its planning process was flawed from the outset, please explain why the clearly foreseeable need for an opt-out program (evidenced by the previous experience of other utilities in other jurisdictions) did not result in an initial offer to retain an analog meter, instead of these substantial and maybe punitive charges that are only now, late in the process of the entire smart meter roll-out program, being announced, apparently as an unexpected afterthought.

3 Impact on the disabled, unwell, and disadvantaged

3.1 In other jurisdictions, for example Pacific Gas & Electric in the US, a 'hardship' category has been established permitting opt-outs in certain income classes to retain their analog meters and pay only $10 for a set-up fee and $5 monthly. Some respondents with serious illnesses and disabilities who cannot, due to medical conditions, be in close proximity to a transmitting device such as a smart meter, have recently written about being faced with the choice of whether to pay for their basic needs for survival (food, medications, rent etc) or whether to pay the increased charges for retaining something they have always had at no extra charge in the past.

3.2 Since the BCUC is currently constrained by the BC government's directive to what they themselves describe as a "narrow" scope of review, and will be assessing solely those issues related to the "fairness" of the charges proposed by BC Hydro in their application, please explain what policy development process and consequent program planning was undertaken by BC Hydro to address the issues of the "fairness" of the Smart Meter Opt-Out program's affordability for all those persons who have medical sensitivities and conditions that in some cases lead to their doctors directing them not to permit radiation of this kind in their vicinity. How were their needs addressed in what BC Hydro planned for them?

3.3 Please explain why BC Hydro has made no provision among the choices offered so far, for people in BC who are in similar circumstance to the PG& E customers referred to above?

3.4 Much has been made recently in the press of the more than two thousand employees of BC Hydro who earn over $100,000 per annum. Perhaps the executives who planned the Smart Meter Choices program have a well-tuned insight into the lives and needs of others who are disadvantaged – we do not know. Therefore please document the ways in which the BC Hydro planning process for this program included any opportunity for input on the part of the many residents of BC who have far lower incomes. Beyond simply making the figures add up, how was the program structured to ensure the "fairness" of those charges (which will also be borne by low income families), for which BC Hydro is now making application?

3.5 Clearly since the planners of this program are themselves human beings with elderly parents, friends, relatives and small children who all live in a world where medical conditions, sicknesses and disabilities occur, they must themselves know that medical priorities are necessarily and throughout society accepted as being of a higher order of importance than solely motivations of profitability and cost recovery. Society has put in place many mechanisms that ensure "fairness" to the disabled and the unwell – for example, surely Hydro's offices must have in place wheelchair - accessible washrooms, as one very minor example of a case where cost is not the sole factor considered in the design. Consequently, since Hydro's planning process from the outset must obviously have taken a naturally human and compassionate accounting of the need for affordability in developing this program, please provide documentation showing the ways in which the need was addressed for the program to apply to the cases of the disabled, the unwell and those with medical sensitivities to the radiation from the transmitters that Hydro is seeking to install on the walls of their homes.

3.6 Please confirm that if such steps to address the readily foreseeable needs of the disabled and less-wealthy etc. were not undertaken, and that no provisions for relief were incorporated into the program by BC Hydro, that such provisions will now forthwith be implemented to provide an affordable option for those who are disabled, or sick, or sensitive to radiation, or currently unwell, or those persons on very limited and fixed incomes who cannot for all the many reasons sustain the fees proposed by BC Hydro.

3.7 If this is not the case, please confirm that in fact no such care and forethought will be exercised in relation to this category of disabled, sick, often elderly and disadvantaged BC Hydro customers.

3.8 If this is not the case (as in 3.6 above), please explain what BC Hydro's recommended course of action is for those persons who are trapped between notional "choices", where the actual options are:

a) don't resist having a smart meter, thereby getting more unwell due to unavoidable radiation causing an escalation of symptoms and sensitivity; or

b) don't accept a smart meter, and go without food, rent, medication or some other necessity of quality of life, by paying BC Hydro's fees; or

c) don't accept a smart meter, don't pay the fees, and consequently try to survive without electricity altogether when BC Hydro follows through with their threats of disconnection.

3.9 Even though the situation described here may (at least in its entirety) only apply to a small number of customers, please confirm that these are, in fact the only "options" and the "choices" that BC Hydro is presenting, and that it considers them "fair".

3.10 Alternatively please confirm that there is another "option" available, and Hydro will explain what it is.

4 Analog meter availability

4.1 Since Hydro says that a customer being able to retain an analogue meter into the future years is conditional upon the supply being available from Hydro's inventory, what steps is Hydro presently taking to research other sources and availability on the world market?

4.2 Since BC Hydro is obtaining Chinese-manufactured smart meters at present for the program, is BC Hydro expecting that there will soon be no source available for analog meters, despite their basic design being widely used in many countries around the world?

4.3 On what information is that expectation based? Please provide documentation.

4.4 If customers retain an analog meter for some time and then change to a smart meter, will they be forced to accept a smart meter model that has never been subjected to the rigorous testing for its safety and suitability for use, as is done with all other CSA electrical equipment?

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.1 Is this the case with all BC Hydro customer groups?

RESPONSE:

In determining charges for all customer groups, BC Hydro subscribes to the regulatory principle of fairness in cost allocation, which means that those causing costs should be responsible for paying them.

Regarding the Meter Choices Program, program costs will be recovered from those customers that have a legacy or radio-off meter installed at their premises which necessitates BC Hydro to incur the costs of the program.

The Meter Choices Program charges have been designed using the regulatory principle above and in accordance with Direction No. 4 to the BCUC. A copy of which is provided as Appendix B to the Application.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.2 Consequently, will BC Hydro be seeking to ensure that the entire cost of e.g . the Site C project is covered by those commercial customers (and no doubt others) who will make up its principal customer group? Please provide relevant documentation, if this is so.

RESPONSE:

BC Hydro undertakes a Fully Allocated Cost of Service (FACOS) Study that allocates energy and capacity costs to each rate class based on the usage and load profile of each class. The FACOS study is used for rate-making purposes to determine if each class covers its cost of service. BC Hydro will be filing a FACOS study in a future rate design application.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.3 If the above is not so, please confirm that, in fact, that principle does **not** apply elsewhere uniformly throughout BC Hydro's operations.

RESPONSE:

Please refer to the response to Polden IR 1.1.2.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.4 Please consequently confirm that it has, in the case of the opt-out program, in fact been applied selectively and for a specific purpose, and explain why the small group of customers seeking to retain their analog meters for reasons of their health, safety and privacy are treated in a different fashion from the treatment extended to, say, large commercial customers.

RESPONSE:

Not confirmed. Please refer to the response to Polden IR 1.1.1.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.5 Please provide supporting documentation that shows the calculations and case for why this makes better business sense.

RESPONSE:

Not applicable.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.6 Alternatively please explain the actual rationale for using the principle in the current situation, and provide documentation that will disprove the widely held notion that is often encountered when members of the public are asked why they think Hydro is charging such high fees for the opt-out program – namely that "it is to punish dissenters and coerce consent to smart meters".

RESPONSE:

Please refer to the response to Polden IR 1.1.1. The charges proposed in the Application are designed to recover the forecast costs that BC Hydro will incur in relation to providing meter choices. The charges are not intended to discourage a customer from selecting a legacy or radio-off meter.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.7 If BC Hydro has been applying this principal (full program cost recovery from its customer group) all along, please provide documentation of at least two other programs (beyond the Smart Meter Choices program) and specify their relevant customer groups, where this principle **has** been followed.

RESPONSE:

Please refer to the Minimum Reconnection Charge and Call-Back Charge in BC Hydro's Schedule of Standard Charges (page 39) in the BC Hydro Electric Tariff. These charges apply to recover the cost from the applicable residential or general service customer.

1.0 Program cost recovery

Reference has been made in the Application and elsewhere that program costs for the opt-out will be recovered from those benefitting from the program.

1.1.8 Please also provide documentation of at least an equal number of programs in which the principle has **not** been the mandated course. If such other programs cannot be found (i.e. the policy of "cost recovery from the particular customer group" is always followed), please confirm that it will in future and in all cases be the uniform policy of BC Hydro that every project and program must recover its costs from its customer group, rather than from general revenue.

RESPONSE:

Please refer to the responses to Polden IRs 1.1.1 and 1.1.2.

2.0 The issue of "fairness"

1.2.1 There are numerous reports currently appearing of the fires and explosions that have either been happening recently to smart meters or possibly been caused by them – most recently the case of some 60 or 70 smart meters that exploded last week on Eureka Street in Forest, Ontario, resulting in power being shut down for more than a day. Since obviously, in the future when we may start to see smart meters involved in these kinds of incidents occurring here in BC (as they have been elsewhere in many countries), BC Hydro may be needing to incorporate the 'collateral damage' costs of employing smart meters into the electricity bills of everyone who accepted a smart meter, please confirm that BC Hydro will out of "fairness" be providing a rebate or appropriate reduction of fees to all those of us who have assisted Hydro in avoiding these foreseeable costs by our choice to retain the generally proven, reliable, safe and well-advanced technology of analog and/or digital meters.

RESPONSE:

Smart meters are as safe as the legacy meters they replace and comply with the British Columbia Electrical Safety Regulations and other provincial and federal standards. Consequently, there are no such costs which have been avoided by customers choosing a legacy meter, and no such rebate is warranted.

2.0 The issue of "fairness"

1.2.2 Since the issue at hand in relation to this application is that of the "fairness" of the cost recovery that the opt-out group of customers is being asked to bear, please confirm that all costs associated with the program to install smart meters throughout the province will be borne **only** by those with smart meters, including all related costs of infrastructure changes and so on, and that those costs will **not** be levied against those of us outside the customer group of smart metered utility customers.

RESPONSE:

No Smart Metering Program costs have been recovered from customers to-date. However, approximately $70 million of benefits attributable to the Smart Metering Program have been reflected in the rates for all customers for the period F2012-F2014.

2.0 The issue of "fairness"

1.2.3 If this is not the case, and no rebate to opt-out customers will apply for the costs that our choices will have saved Hydro from incurring, but only charges to opt-outs will apply for the costs they claim that our choices have incurred, please explain why it's "fair" one way round, but not "fair" the other way round.

RESPONSE:

Please refer to the response to BCUC IR 1.7.1.

2.0 The issue of "fairness"

1.2.4 Please provide documentation that shows how the issues particularly of "fairness" of charges for the opt-out program were initially planned for, in the policy development stage of the smart meter installation program.

RESPONSE:

The charges applied for in the Application are designed to align with the requirements of Direction No. 4 to the BCUC, a copy of which is provided in Appendix B to the Application.

2.0 The issue of "fairness"

1.2.5 If no documentation is available to show such planning, please confirm that the initial planning process was in fact flawed, since most other regional utilities who have previously gone through this smart meter introduction process have either prudently taken account of the need for an opt-out program initially at an early stage, or else soon discovered from the widespread dissatisfaction and resistance among the target population the resulting need to offer an opt-out.

RESPONSE:

Not confirmed. Many jurisdictions that have successfully implemented smart meters do not offer an opt-out program. The Smart Meters and Smart Grid Regulation required BC Hydro to install a smart meter at all eligible premises and no other meter options were permitted until the Regulation was amended in December 2012. In July 2013, the Government of B.C. decided that BC Hydro will offer the Meter Choices Program to residential customers where a smart meter had not yet been installed at their premises.

Please also refer to the response to Wong IR 1.1.2.

2.0 The issue of "fairness"

1.2.6 If Hydro does not accept that its planning process was flawed from the outset, please explain why the clearly foreseeable need for an opt-out program (evidenced by the previous experience of other utilities in other jurisdictions) did not result in an initial offer to retain an analog meter, instead of these substantial and maybe punitive charges that are only now, late in the process of the entire smart meter roll-out program, being announced, apparently as an unexpected afterthought.

RESPONSE:

Please refer to the response to Polden IR 1.2.5.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.1 In other jurisdictions, for example Pacific Gas & Electric in the US, a 'hardship' category has been established permitting opt-outs in certain income classes to retain their analog meters and pay only $10 for a set-up fee and $5 monthly. Some respondents with serious illnesses and disabilities who cannot, due to medical conditions, be in close proximity to a transmitting device such as a smart meter, have recently written about being faced with the choice of whether to pay for their basic needs for survival (food, medications, rent etc) or whether to pay the increased charges for retaining something they have always had at no extra charge in the past.

RESPONSE:

No question identified.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.2 Since the BCUC is currently constrained by the BC government's directive to what they themselves describe as a "narrow" scope of review, and will be assessing solely those issues related to the "fairness" of the charges proposed by BC Hydro in their application, please explain what policy development process and consequent program planning was undertaken by BC Hydro to address the issues of the "fairness" of the Smart Meter Opt-Out program's affordability for all those persons who have medical sensitivities and conditions that in some cases lead to their doctors directing them not to permit radiation of this kind in their vicinity. How were their needs addressed in what BC Hydro planned for them?

RESPONSE:

As a public utility subject to the *Utilities Commission Act*, BC Hydro's rates are set on a cost of service basis in accordance with requirements in that legislation and other applicable regulations. Under the Utilities Commission Act, BC Hydro is not able to offer a discounted rate preferentially to a low income or disabled customer. Subsidised rates for utility service for low income or disabled customers is a matter for government policy and not considered under the *Utilities Commission Act* and regulation provisions of general application. Generally speaking, governments choose to deliver their assistance programs through direct channels rather than indirectly through subsidised utility rates.

BC Hydro believes the charges it has proposed in the Application are in accordance with the requirements of Direction No. 4 to the BCUC, a copy of which is included with the Application as Appendix B.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.3 Please explain why BC Hydro has made no provision among the choices offered so far, for people in BC who are in similar circumstance to the PG& E customers referred to above?

RESPONSE:

Each of the main elements of the Meter Choices Program is required by Direction No. 4 or by the BCUC orders issued in accordance with Direction No. 4. Please refer to the response to Polden IR 1.3.2.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.4 Much has been made recently in the press of the more than two thousand employees of BC Hydro who earn over $100,000 per annum. Perhaps the executives who planned the Smart Meter Choices program have a well-tuned insight into the lives and needs of others who are disadvantaged – we do not know. Therefore please document the ways in which the BC Hydro planning process for this program included any opportunity for input on the part of the many residents of BC who have far lower incomes. Beyond simply making the figures add up, how was the program structured to ensure the "fairness" of those charges (which will also be borne by low income families), for which BC Hydro is now making application?

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.5 Clearly since the planners of this program are themselves human beings with elderly parents, friends, relatives and small children who all live in a world where medical conditions, sicknesses and disabilities occur, they must themselves know that medical priorities are necessarily and throughout society accepted as being of a higher order of importance than solely motivations of profitability and cost recovery. Society has put in place many mechanisms that ensure "fairness" to the disabled and the unwell – for example, surely Hydro's offices must have in place wheelchair -accessible washrooms, as one very minor example of a case where cost is not the sole factor considered in the design. Consequently, since Hydro's planning process from the outset must obviously have taken a naturally human and compassionate accounting of the need for affordability in developing this program, please provide documentation showing the ways in which the need was addressed for the program to apply to the cases of the disabled, the unwell and those with medical sensitivities to the radiation from the transmitters that Hydro is seeking to install on the walls of their homes.

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.6 Please confirm that if such steps to address the readily foreseeable needs of the disabled and less-wealthy etc. were not undertaken, and that no provisions for relief were incorporated into the program by BC Hydro, that such provisions will now forthwith be implemented to provide an affordable option for those who are disabled, or sick, or sensitive to radiation, or currently unwell, or those persons on very limited and fixed incomes who cannot for all the many reasons sustain the fees proposed by BC Hydro.

RESPONSE:

Not confirmed. Please refer to the response to Polden IR 1.3.2.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.7 If this is not the case, please confirm that in fact no such care and forethought will be exercised in relation to this category of disabled, sick, often elderly and disadvantaged BC Hydro customers.

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.8 If this is not the case (as in 3.6 above), please explain what BC Hydro's recommended course of action is for those persons who are trapped between notional "choices", where the actual options are:

a) don't resist having a smart meter, thereby getting more unwell due to unavoidable radiation causing an escalation of symptoms and sensitivity; or
b) don't accept a smart meter, and go without food, rent, medication or some other necessity of quality of life, by paying BC Hydro's fees; or
c) don't accept a smart meter, don't pay the fees, and consequently try to survive without electricity altogether when BC Hydro follows through with their threats of disconnection.

RESPONSE:

BC Hydro makes no recommendation with respect to which Meter Choices Program option an eligible customer chooses.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.9 Even though the situation described here may (at least in its entirety) only apply to a small number of customers, please confirm that these are, in fact the only "options" and the "choices" that BC Hydro is presenting, and that it considers them "fair".

RESPONSE:

Eligible customers that do not have a smart meter installed at their premises have three options under the Meter Choices Program: (1) the installation of a standard smart meter, (2) the installation of a radio-off meter, or (3) the existing legacy meter can remain installed at the premises.

In addition, the meter installed at any customer's premises can be moved to another location on the property at the customer's expense.

3.0 Impact on the disabled, unwell, and disadvantaged

1.3.10 Alternatively please confirm that there is another "option" available, and Hydro will explain what it is.

RESPONSE:

Please refer to the response to Polden IR 1.3.9.

4.0 Analog meter availability

1.4.1 Since Hydro says that a customer being able to retain an analogue meter into the future years is conditional upon the supply being available from Hydro's inventory, what steps is Hydro presently taking to research other sources and availability on the world market?

RESPONSE:

BC Hydro will not purchase any additional legacy meters.

4.0 Analog meter availability

1.4.2 Since BC Hydro is obtaining Chinese-manufactured smart meters at present for the program, is BC Hydro expecting that there will soon be no source available for analog meters, despite their basic design being widely used in many countries around the world?

RESPONSE:

Itron OpenWay meters are assembled, and circuit boards are fabricated, in the United States using parts sourced globally. Suitable electromechanical meters for the North American market have not been manufactured since 2010.

4.0 Analog meter availability

1.4.3 On what information is that expectation based? Please provide documentation.

RESPONSE:

The study titled "Testing and Performance Assessments for Advanced Meters" indicates that all four primary manufacturers of residential electromechanical meters halted the production of these meters by 2010. The study cannot be provided due to copyright restrictions. However, the abstract is available at: http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001020089.

4.0 Analog meter availability

1.4.4 If customers retain an analog meter for some time and then change to a smart meter, will they be forced to accept a smart meter model that has never been subjected to the rigorous testing for its safety and suitability for use, as is done with all other CSA electrical equipment?

RESPONSE:

An Itron OpenWay meter will be installed at the premises of customers who choose a smart meter installation, and these smart meters are as safe as the legacy meters they replace and comply with the British Columbia Electrical Safety Regulations and other provincial and federal standards.

From: Andy Shadrack [ashadra@telus.net]
Sent: Wednesday, November 6, 2013 6:48 AM
To: Commission Secretary BCUC:EX; bchydroregulatorygroup@bchydro.com; david@legalmind.ca; cweafer@owenbird.com; wjandrews@shaw.ca; Dennis_barbisan@hotmail.com; barkerbrenton@gmail.com; kim-mortgages@eastlink.ca; tbraithwaite@bcpiac.com; support@bcpiac.com; debruijn@shaw.ca; d_sculpts@shaw.ca; bharper@econalysis.ca; thackney@shaw.ca; ajhurd@telus.net; fredweislaw@gmail.com; c6934@telus.net; PHL222@telus.net; jbwonderful@shaw.ca; marchantp@shaw.ca; bobmck@shaw.ca; roger.middleton@telus.net; penrod@saltspring.com; jaynepriest@gmail.com; epritchard@bcpiac.com; john@vaseguy.com; tvanswieten@metchosin.ca; norm.r@sios.ca; tps.x@telus.net; jskogsta@telus.net; vasana@camelot-connection.com; camelot@islandnet.com; info@blueharvestfarm.com; tystanley777@yahoo.com; eliteservice@shaw.ca; rwarder@telus.net; steven.wishart@gmail.com; david.jae.wong@gmail.com
Cc: electricity.regulatory.affairs@fortisbc.com; mcgreal@telus.net; bob yetter
Subject: Intervenor Information Request No 1: BC Hydro Smart Meter Choices Program

Kaslo

November 6th, 2013

Attention: Ms. Erica Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms Hamilton,

Foreword

As Director for Area D in the Regional District CentraI Kootenay I represent some 1,400 permanent residents in North Kootenay Lake, the Lardeau and Duncan valleys (more in summer) across some 5,700 square kilometres. Area D's population density is .18 persons per square kilometre, and is one of 88 Electoral Areas and two District Municipalities in BC, mostly in the Interior, where the population density is less than 1 person per square kilometre.

At question 4 of the FortisBC Inc Radio-Off Meter Option application (C7-2) median income information from the 2005 Canada Census was provided that showed that the median after tax income for all private households in Area D was $33,198, that for couples with children $35,032, those without children $40,530 and lone occupant households $19,449. Median income, I remind the Commission and applicant, is the point at which 50% have an income which is lower.

Lastly, like Area H in the neighbouring Slocan Valley, Area D's electrical supply service is split between BC Hydro and Fortis BC Inc, except that BC Hydro does not obtain its power from an owned source. Rather it purchases a power supply from Fortis BC Inc, who in turn buy some of their power supply under the Canal Plant agreement from BC Hydro. Thus from the perspective of some FortisBC Inc and BC Hydro West Kootenay customers, it is extremely difficult to understand why they are being asked to pay more for servicing and meter reading than the other.

Intervenor Information Request No 1*

1. Can BC Hydro please confirm that their proposed radio-off meter set up fee is $100, whereas FortisBC Inc's is $110?

2. Could BC Hydro receive radio-off meters from the factory, rather than spend time and money turning each meter off separately?

3. In calculating their proposed meter-off fee, has BC Hydro deducted the generic cost of installing a smart meter from their calculated meter-off installation cost?

4. Why, for example, should BC Hydro charge any travel time as they would have to travel to the site to install the smart meter in the first place, and so does it not mean that the only additional cost is the time taken to switch the meter off?

5. How does the time taken to switch a meter off differ from the time taken to calibrate a meter and ensure that once installed it is functional, especially in remote and rural areas where FortisBC has admitted it is going to have to install range extenders and/or may be unable to install a smart meter due to distance and terrain anyway?

6. Why does the time necessary to install a meter-on system in remote and rural areas not equal the time taken to install a meter-off?

7. Can BC Hydro please confirm that they are proposing to charge $240 per year to service and read a radio-off meter, whereas FortisBC is proposing to charge $132 per year.

8. Can BC Hydro please explain why, especially given that BC Hydro's and Fortis BC's meter-off set up fee is only $10 apart, BC Hydro is proposing to charge $20 per month to service and read a radio-off meter whereas FortisBC is proposing to charge $22 for each of the six service periods in a year?

9. What servicing and meter reading costs is BC Hydro incurring that FortisBC is not, and/or what costs is BC Hydro including that Fortis BC is not?

10. In the FortisBC Inc 2009 Rate Design and Cost of Service application the Commission filed as evidence the letter of May 27, 2008 from Minister Neufeld to Ms Patricia A.Wallace, President of the Union of BC Municipalities that states in part:

"*...Electricity rates are to be set on a postage stamp basis. This means all customers within a particular customer class will receive the same rate, regardless of their location within the province...BCUC reviews are public reviews, and all stakeholders, including local governments, are welcome to participate and provide input"* (originally filed as Exhibit B-47, BC Hydro Rate Design 2007 and then refiled as Exhibit A2-1 FortisBC Inc 2009 Rate Design and Cost of Service).

Can BC Hydro, given the foregoing provincial government policy, please explain why residential customers of BC Hydro in the North Kootenay Lake, Lardeau and Duncan valleys (especially given that Fortis BC Inc is supplying the wholesale power to BC Hydro and has the service contract for this BC Hydro service area), why the Commission should allow BC Hydro to charge $108 per year more to service and read a radio-off meter than FortisBC Inc is proposing to in its application, especially for residents who live in the same location in the province?

11. Can BC Hydro please confirm that each residential customer pays a basic charge of $.1527 (15.27 cents per

day) for servicing and administration of the account, as compared to each FortisBC residential customer paying the equivalent of $.4986 (49.86 cents) per day?

12. Can BC Hydro please confirm that each residential customer will therefore pay, with the smart meter-off fee, the equivalent of $.8102 (81.02 cents) per day, as compared to each FortisBC residential customer, with their smart meter-off fee, paying the equivalent of $.8602 (86.02 cents) a day?

13. Can BC Hydro please explain why its meter-off fee and general administration service and meter reading fee combined are very close to the combined cost being applied for by Fortis BC, but that customers who agree to install a smart meter will pay so much less than a FortisBC Inc customer for administrative servicing and meter reading, especially given that the smart meter is the same make and type?

14. According to the 2005 Canada Census a lone occupant household in Area H of the Slocan Valley, of similar socio-economic demographics to the BC Hydro service area, has a daily median after tax income of $43.62, and that for someone on a Canada Pension Plan disability pension, like my spouse, $25.11 per day. As a consequence the meter-on cost of administration servicing and meter reading is approximately .35% and .61%, respectively, of daily income, whereas the meter-off cost for the same administration servicing and meter reading is 1.86% and 3.23%, respectively, of daily income. Consequently a disabled customer who fears that a smart meter may exacerbate their medical condition and/or is advised to avoid a smart meter by their family physician or specialist, who chooses to opt out, will pay over five times more to be hooked up to the BC Hydro grid.

Can BC Hydro please explain why requiring a disabled customer to pay more than five times the fee - .61% of daily income versus 3.23% - just to be hooked up to the BC Hydro grid, is not punitive and discriminatory towards that customer?

15. On Tuesday, October 22nd Bob Yetter filed a proposal with BC Hydro on behalf of 29 permanent and part time residents of Johnson's Landing, with a copy being cc'd to the Commission without it being assigned to this hearing. I attach the document by separate email as Appendix A to this first Intervenor Information Request, noting that three more residents sent in assent to opt out after October 22nd.

Can BC Hydro please confirm Mr Yetter's statement, concerning remote and rural residential customers in BC, that:

"*In the past, with severe winter weather conditions, or with certain residences which become inaccessible due to winter road conditions, people have been allowed (even requested by BC Hydro) to report their own meter readings*".

16. Can BC Hydro confirm, for legacy meters, if they are willing to enter into agreements, with permanent residential customers in Johnson's Landing and other remote and rural residential customers around BC, that would allow:

"*...each permanent resident, either monthly or bi-monthly,* [to] *send in their meter reading data via phone, mail, or email , either as the written number, or as a digital photograph of the meter itself, or through a form provided by BC Hydro for this purpose, along with their name, address and account number.*"

17. Can BC Hydro confirm, for legacy meters, that:

"*These readings can then be verified with an occasional meter reading by BC Hydro personnel, perhaps on an annual or semi-annual basis*".

18. Can BC Hydro confirm, for legacy meters, that servicing and meter reading costs could be reduced from $420 per year to $35 for an annual reading, and to $70 for a semi-annual reading, if they accepted the Johnson's Landing proposal?

19. Can BC Hydro please confirm that, where a customer is currently on an Equal Payment Plan program and wishes to retain their legacy meter, BC Hydro has no need to read the meter more than once each year to confirm that the right EPP charge is being applied?

20. Can BC Hydro confirm, for legacy meters, if they are willing to enter into agreements, with part-time residential customers in Johnson's Landing and other remote and rural residential customers around BC, that would allow:

"Power usage data from part-time residents can be submitted by the same means when they are here, or by proxy if necessary in prolonged absences, and likewise be verified with an occasional meter reading by BC Hydro personnel as described above.

21. Can BC Hydro confirm that, where a customer is absent from his or her property, the customer can designate and so notify BC Hydro of who the proxy reader is when they are away from the property?

23. If BC Hydro is not prepared to continue requesting and/or allowing self-read metering in remote and rural BC, can BC Hydro please identify other ways in which it has thought about reducing the cost of reading either radio-off and legacy meters for the customer, especially for low income and disabled customers?

24. Can BC Hydro confirm, for legacy meters, that the Johnson's Landing:

"*...proposal to provide power usage data to BC Hydro would in no way infringe on, change, or replace, the current basic contract each customer has with BC Hydro to supply 120/240 Volt ,60 Cycle electricity*".

25. Can BC Hydro confirm, as is the case with the current FortisBC Inc Commission-approved tariff, that BC Hydro has no requirement or stipulation that it has to read the meters itself?

* I am extremely busy in my capacity as Director for Area D, President of the Association of Kootenay Boundary Local Governments and as a member of the Union of BC Municipalities Executive Board, and as such would appreciate it if BC Hydro could supply written answers to all questions. While I understand that some questions may dovetail with those of other intervenors, in this day and technological age it only takes a couple of keystrokes to cut and paste an answer to another intervenor, and acknowledge that is what has been done. Simply writing "please review answer to intervenor x" takes unnecessary time to search through other text to find the answer. During one weekend this spring, for example, I had over 1,800 pages of material to review. Thank you for your consideration in this matter.

Respectfully submitted,
Andy Shadrack
Director Area D
RDCK

From: Andy Shadrack [ashadra@telus.net]
Sent: Wednesday, November 6, 2013 7:04 AM
To: Commission Secretary BCUC:EX; bchydroregulatorygroup@bchydro.com; david@legalmind.ca; cweafer@owenbird.com; wjandrews@shaw.ca; Dennis_barbisan@hotmail.com; barkerbrenton@gmail.com; kim-mortgages@eastlink.ca; tbraithwaite@bcpiac.com; support@bcpiac.com; debruijn@shaw.ca; d_sculpts@shaw.ca; bharper@econalysis.ca; thackney@shaw.ca; ajhurd@telus.net; fredweislaw@gmail.com; c6934@telus.net; PHL222@telus.net; jbwonderful@shaw.ca; marchantp@shaw.ca; bobmck@shaw.ca; roger.middleton@telus.net; penrod@saltspring.com; jaynepriest@gmail.com; epritchard@bcpiac.com; john@vaseguy.com; tvanswieten@metchosin.ca; norm.r@sios.ca; tps.x@telus.net; jskogsta@telus.net; vasana@camelot-connection.com; camelot@islandnet.com; info@blueharvestfarm.com; tystanley777@yahoo.com; eliteservice@shaw.ca; rwarder@telus.net; steven.wishart@gmail.com; david.jae.wong@gmail.com
Cc: electricity.regulatory.affairs@fortisbc.com; mcgreal@telus.net; bob yetter
Subject: Appendix A: Meter Choices Proposal From Johnson's Landing

Date: Tue, 22 Oct 2013 19:47:17 -0700
Subject: Meter Choices proposal from Johnsons Landing
From: bob yetter <robertyetter@gmail.com>
To: gregreimer@bchydro.com
Cc: Commission.Secretary@bcuc.com, andy shadrack <ashadra@telus.net>,
Aimee Watson <aimeewatson@nklcss.org>, Michelle Mungall <michelle.mungall.mla@leg.bc.ca>,
Alex Atamanenko <alex.atamanenko.c1@parl.gc.ca>

BC Hydro - Meter Choices
ATT: Greg Reimer,
Executive Vice President, Transmission and Distribution
PO Box 9530 Stn Terminal
Vancouver, BC V6B 4G8

gregreimer@bchydro.com
smartmeters@bchydro.com

Mr. Greg Reimer,
It is our understanding that BC Hydro is considering written proposals regarding options to meter reading, with submissions due by Oct 24th.
The following is a proposal for this purpose from residents of the community of Johnsons Landing, BC, sent via email and Canada Post on Tuesday, Oct 22, 2013.
Thank you very much for this opportunity.
Sincerely,
Bob Yetter,
RR1, S4, C6,
Kaslo, BC
V0G 1M0
250-366-0022
Acct# 2180256

robertyetter@gmail.com
A proposal from community members of Johnsons Landing BC for the BC Hydro Meter Choices Program
October 22, 2013
The remote community of Johnsons Landing is located on the northern end of Kootenay Lake, an hour's drive north of the nearest town of Kaslo, and at the end of a 22 kilometer gravel road. There are approximately 17 full-time resident households in Johnsons Landing. The number of these that have smart meters installed is quite small (4 or 5 households). Given the remote proximity of the community, as well as the extraordinary costs involved with installing the necessary smart meter relay infrastructure to serve only these few meters, it seems worthwhile to consider a mutually agreeable solution to the problem of meter reading.
At present, there seems to be no meter readers operating in the Johnsons Landing area, and power usage is being estimated based on previous use. It also appears clear that there is as of yet no infrastructure in place to read the few smart meters that have been installed in this community, and they still have to be read manually as do the analogue meters.
Given that a significant number of households in Johnsons Landing have refrained from having smart meters installed, and that smart meter capable infrastructure has yet to be installed here, we would like to offer a proposal for BC Hydro meter reading in our community.
In the past, with severe winter weather conditions, or with certain residences which become inaccessible due to winter road conditions, people have been allowed (even requested by BC Hydro) to report their own meter readings. Upon that precedent, and considering the above outlined limitations, as well as our isolated location, we would like to propose the following power usage reporting program for ourselves:
That each permanent resident, either monthly or bi-monthly, send in their meter reading data via phone, mail, or email , either as the written number, or as a digital photograph of the meter itself, or through a form provided by BC Hydro for this purpose, along with their name, address and account number. These readings can then be verified with an occasional meter reading by BC Hydro personnel, perhaps on an annual or semi-annual basis.

Power usage data from part-time residents can be submitted by the same means when they are here, or by proxy if necessary in prolonged absences, and likewise be verified with an occasional meter reading by BC Hydro personnel as described above.
This proposal to provide power usage data to BC Hydro would in no way infringe on, change, or replace, the current basic contract each customer has with BC Hydro to supply 120/240 Volt ,60 Cycle electricity.
The above proposed method of obtaining power usage data in Johnsons Landing would negate the need for additional monthly charges for meter reading, and could result in a significant overall cost savings to BC Hydro. These savings would easily cover the costs of the occasional meter readings to verify the volunteer submissions.
In contrast, to charge people additional fees for declining to utilize a system which, in our case, does not even actually exist, is quite unfair.
Thank you for giving consideration to our proposal in this unique situation.
This proposal is endorsed by the 29 undersigned members of the community of Johnsons Landing, constituting 87% of the full-time resident households, and representing 19 meters*:
Bob Yetter
Susan VanRooy

Gerry Rogers
Linda Godbe
Loran Godbe
Susan Grimble
Richard Taylor
Osa Thatcher
Paul Hunter
Roland Proctor
Susan Archibald
Lew McMillan
Patrick Steiner
Colleen O'Brian
Kurt Boyer
John Kingsmill
Angele Ortega
Richard Ortega
Harvey Armstrong
Kate O'Keefe
Nick Fuss
Lindseay Snyder
Eric Schindler
Sailan Schindler
Brent McDonald
Vandi Foreman
Betty Didcoct
Roger Atkins
Carol Carrigan
(Note: All but two full-time resident households endorsed this proposal, as have some of the part-time residents. The remaining part-time residents contacted have not responded either way.)
cc:
Erica Hamilton, Commission Secretary, BC Utilities Commission,
Commission.Secretary@bcuc.com
RDCK Area D Director, Andy Shadrack
ashadra@telus.net
RDCK Area D Alternate, Aimee Watson
aimeewatson@nklcss.org
MLA Michelle Mungall
michelle.mungall.mla@leg.bc.ca
MP Alex Atamanenko
alex.atamanenko.c1@parl.gc.ca

* On Thursday October 31st I received an email from Mr Yetter adivsing that three more permanent and part-time residents, Gwen Teichroeb, Ed Washington and John Lerbsher, had assented to not having a smart meter, bringing the total number of properties proposing no smart meter to 22. In addition 106 persons had previously signed a petition stating they did not want a smart meter in nearby neighbouring Argenta. It is subsequently noted that the number of persons in Area D of the Regional District Central Kootenay, from these two communities alone, who have formally advised BC Hydro they do not want a smart meter roughly equals 9.1% of the 2011 Census Canada population survey.

1.0 Can BC Hydro please confirm that their proposed radio-off meter set up fee is $100, whereas FortisBC Inc's is $110?

RESPONSE:

BC Hydro's Radio-off Meter initial charge is $100 when the existing meter is a legacy meter and $155 when the existing meter is a smart meter. FortisBC's radio-off meter per-premise set up fee is $110.

2.0 Could BC Hydro receive radio-off meters from the factory, rather than spend time and money turning each meter off separately?

RESPONSE:

Please refer to the response to CSTS IR 1.75.

3.0 In calculating their proposed meter-off fee, has BC Hydro deducted the generic cost of installing a smart meter from their calculated meter-off installation cost?

RESPONSE:

No. Please refer to the response to BCUC IR 1.7.1.

4.0 Why, for example, should BC Hydro charge any travel time as they would have to travel to the site to install the smart meter in the first place, and so does it not mean that the only additional cost is the time taken to switch the meter off?

RESPONSE:

No. The proposed initial charge of $100 for eligible customers with a legacy meter who choose to have a radio-off meter installed does not include the cost for the installation of the radio-off meter. The charge does include the cost of exchanging the radio-off meter for a smart meter when the customer either moves premises or chooses a smart meter in the future. If an eligible customer requests a radio-off meter for a premises where a smart meter is installed, the initial fee is $155, which does include the installation cost of the radio-off meter. Please refer to the response to CEC IR 1.24.3.2.1.

5.0 How does the time taken to switch a meter off differ from the time taken to calibrate a meter and ensure that once installed it is functional, especially in remote and rural areas where FortisBC has admitted it is going to have to install range extenders and/or may be unable to install a smart meter due to distance and terrain anyway?

RESPONSE:

As indicated in section 3.4.2.2 of the Application, it takes approximately 25 minutes to update the firmware and deactivate the radio. There is no calibration required for a smart meter once it is installed.

6.0 Why does the time necessary to install a meter-on system in remote and rural areas not equal the time taken to install a meter-off?

RESPONSE:

All else being equal (i.e., travel distance, quantity) there should not be any difference in the time it takes to install a smart meter relative to the time it takes to install a radio-off meter.

7.0 Can BC Hydro please confirm that they are proposing to charge $240 per year to service and read a radio-off meter, whereas FortisBC is proposing to charge $132 per year.

RESPONSE:

BC Hydro proposes that the radio-off meter charge be $20 per month which calculates to $240 per year. FortisBC proposes that the radio-off meter charge be a per-read fee of $22 which calculates to $132 per year assuming bi-monthly meter reading.

8.0 Can BC Hydro please explain why, especially given that BC Hydro's and Fortis BC's meter-off set up fee is only $10 apart, BC Hydro is proposing to charge $20 per month to service and read a radio-off meter whereas FortisBC is proposing to charge $22 for each of the six service periods in a year?

RESPONSE:

BC Hydro is not familiar with the cost model used by FortisBC to estimate costs in the determination of their proposed charges and therefore cannot comment specifically on contributors to the observed difference in proposed fees.

9.0 What servicing and meter reading costs is BC Hydro incurring that FortisBC is not, and/or what costs is BC Hydro including that Fortis BC is not?

RESPONSE:

BC Hydro assumes this question is in relation to the monthly charges applicable to the BC Hydro and FortisBC radio-off meter options.

BC Hydro has not undertaken a comprehensive review of the differences between its Meter Choices Program and FortisBC's Radio-Off AMI Meter Option. However, based on FortisBC's Radio-Off AMI Meter Option Application dated August 30, 2013, it appears that FortisBC's proposed charge of $22 bi-monthly does not include IT maintenance and support or capital related costs. In addition, BC Hydro's forecast of its vehicle and travel costs per radio-off meter read is significantly higher than FortisBC's forecast of its vehicle and travel costs per radio-off meter read. This appears to be primarily due to the geography, scope and customer density of BC Hydro's service area, and therefore the need for airfare, ferries, lodging and meals for remote locations.

10.0 In the FortisBC Inc 2009 Rate Design and Cost of Service application the Commission filed as evidence the letter of May 27, 2008 from Minister Neufeld to Ms Patricia A.Wallace, President of the Union of BC Municipalities that states in part:

"...*Electricity rates are to be set on a postage stamp basis. This means all customers within a particular customer class will receive the same rate, regardless of their location within the province...BCUC reviews are public reviews, and all stakeholders, including local governments, are welcome to participate and provide input*" (originally filed as Exhibit B-47, BC Hydro Rate Design 2007 and then refiled as Exhibit A2-1 FortisBC Inc 2009 Rate Design and Cost of Service).

Can BC Hydro, given the foregoing provincial government policy, please explain why residential customers of BC Hydro in the North Kootenay Lake, Lardeau and Duncan valleys (especially given that Fortis BC Inc is supplying the wholesale power to BC Hydro and has the service contract for this BC Hydro service area), why the Commission should allow BC Hydro to charge $108 per year more to service and read a radio-off meter than FortisBC Inc is proposing to in its application, especially for residents who live in the same location in the province?

RESPONSE:

The postage stamp policy stated by Minister Neufeld applies to the rates of a single utility, and does not apply to require the BCUC to align BC Hydro's rates to those of FortisBC, or vice-versa. The BCUC has made it clear on several occasions that the rates of BC Hydro and FortisBC will differ due to different cost drivers. For example, the BCUC stated the following in its decision on FortisBC's 2012-13 Revenue Requirements Application (at page 20):

> **"FortisBC operates with a different set of supply resources and with a different customer base in terms of geography, population density and the residential/commercial/industrial mix it faces. The Commission panel has no mandate, nor does it find it appropriate, to require FortisBC to manage its utility business to produce rates or programs identical to those of BC Hydro. The Commission Panel believes that FortisBC's responsibility is to provide safe and reliable service in a cost-effective manner consistent with British Columbia's energy objectives. To do so, FortisBC must design and manage its system based on the resources available to it and the needs of its customers. This, at times, may result in rates that are greater than those of BC Hydro and potentially times when they are less."**

11.0 Can BC Hydro please confirm that each residential customer pays a basic charge of $.1527 (15.27 cents per day) for servicing and administration of the account, as compared to each FortisBC residential customer paying the equivalent of $.4986 (49.86 cents) per day?

RESPONSE:

Confirmed.

12.0 Can BC Hydro please confirm that each residential customer will therefore pay, with the smart meter-off fee, the equivalent of $.8102 (81.02 cents) per day, as compared to each FortisBC residential customer, with their smart meter-off fee, paying the equivalent of $.8602 (86.02 cents) a day?

RESPONSE:

Confirmed.

13.0 Can BC Hydro please explain why its meter-off fee and general administration service and meter reading fee combined are very close to the combined cost being applied for by Fortis BC, but that customers who agree to install a smart meter will pay so much less than a FortisBC Inc customer for administrative servicing and meter reading, especially given that the smart meter is the same make and type?

RESPONSE:

BC Hydro does not understand the FortisBC cost structure well enough to answer this question.

14.0 According to the 2005 Canada Census a lone occupant household in Area H of the Slocan Valley, of similar socio-economic demographics to the BC Hydro service area, has a daily median after tax income of $43.62, and that for someone on a Canada Pension Plan disability pension, like my spouse, $25.11 per day. As a consequence the meter-on cost of administration servicing and meter reading is approximately .35% and .61%, respectively, of daily income, whereas the meter-off cost for the same administration servicing and meter reading is 1.86% and 3.23%, respectively, of daily income. Consequently a disabled customer who fears that a smart meter may exacerbate their medical condition and/or is advised to avoid a smart meter by their family physician or specialist, who chooses to opt out, will pay over five times more to be hooked up to the BC Hydro grid.

Can BC Hydro please explain why requiring a disabled customer to pay more than five times the fee - .61% of daily income versus 3.23% - just to be hooked up to the BC Hydro grid, is not punitive and discriminatory towards that customer?

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

15.0 On Tuesday, October 22nd Bob Yetter filed a proposal with BC Hydro on behalf of 29 permanent and part time residents of Johnson's Landing, with a copy being cc'd to the Commission without it being assigned to this hearing. I attach the document by separate email as Appendix A to this first Intervenor Information Request, noting that three more residents sent in assent to opt out after October 22nd.

Can BC Hydro please confirm Mr Yetter's statement, concerning remote and rural residential customers in BC, that:

"*In the past, with severe winter weather conditions, or with certain residences which become inaccessible due to winter road conditions, people have been allowed (even requested by BC Hydro) to report their own meter readings*".

RESPONSE:

Although this may have occurred at Johnson's Landing, this is an exceptional circumstance. Please refer to the response to BCUC IR 1.9.2.

16.0 Can BC Hydro confirm, for legacy meters, if they are willing to enter into agreements, with permanent residential customers in Johnson's Landing and other remote and rural residential customers around BC, that would allow:

"...*each permanent resident, either monthly or bi-monthly,* [to] *send in their meter reading data via phone, mail, or email , either as the written number, or as a digital photograph of the meter itself, or through a form provided by BC Hydro for this purpose, along with their name, address and account number.*"

RESPONSE:

BC Hydro has no plans to institute a policy of self-reads. Please refer to the response to BCUC IR 1.9.2.

17.0 Can BC Hydro confirm, for legacy meters, that:

"*These readings can then be verified with an occasional meter reading by BC Hydro personnel, perhaps on an annual or semi-annual basis*".

RESPONSE:

Not confirmed. Please refer to the response to BCUC IR 1.9.2.

18.0 Can BC Hydro confirm, for legacy meters, that servicing and meter reading costs could be reduced from $420 per year to $35 for an annual reading, and to $70 for a semi-annual reading, if they accepted the Johnson's Landing proposal?

RESPONSE:

Not confirmed.

Please refer to the response to BCUC IR 1.9.2.

19.0 Can BC Hydro please confirm that, where a customer is currently on an Equal Payment Plan program and wishes to retain their legacy meter, BC Hydro has no need to read the meter more than once each year to confirm that the right EPP charge is being applied?

RESPONSE:

Not confirmed. For customers on the Equal Payment Plan (EPP), BC Hydro reads the meter on the same bi-monthly schedule as other meters.

Reading meters only once per year would pose a risk for customers as they could be faced with a large adjustment when the EPP amount is trued up. Customer consumption can increase due to a number of factors, such as having additional occupants staying at the home or adding significant electrical load. This may require that the monthly equal payment amount needs to be increased before the end of one year. The reverse is also true, where consumption drops and the EPP amount may need to be reduced. There is a process in place to review and potentially adjust customers' equal payment amounts periodically throughout the year based on actual consumption. This review requires that an actual meter reading has been obtained.

The theft detection solution relies on electricity balance analysis using interval data collected by smart meters and radio-off meters (in conjunction with event alarms and energy profiles). BC Hydro needs to collect the interval data from radio-off meters every two months in order to perform timely electricity balance analysis. BC Hydro also needs to collect actual consumption from legacy meters on a timely basis in order to support electricity balance analysis.

20.0 Can BC Hydro confirm, for legacy meters, if they are willing to enter into agreements, with part-time residential customers in Johnson's Landing and other remote and rural residential customers around BC, that would allow:

***"Power usage data from part-time residents can be submitted by the same means when they are here, or by proxy if necessary in prolonged absences, and likewise be verified with an occasional meter reading by BC Hydro personnel as described above*.**

RESPONSE:

BC Hydro has no plans to institute a policy of self-reads. Please refer to the response to BCUC IR 1.9.2.

21.0 Can BC Hydro confirm that, where a customer is absent from his or her property, the customer can designate and so notify BC Hydro of who the proxy reader is when they are away from the property?

RESPONSE:

BC Hydro has no plans to institute a policy of self-reads. Please refer to the response to BCUC IR 1.9.2.

22.0 If BC Hydro is not prepared to continue requesting and/or allowing self-read metering in remote and rural BC, can BC Hydro please identify other ways in which it has thought about reducing the cost of reading either radio-off and legacy meters for the customer, especially for low income and disabled customers?

RESPONSE:

BC Hydro endeavors to ensure low cost meter reading solutions for all customers. As a public utility subject to the *Utilities Commission Act*, BC Hydro is not able to offer a differentiated service preferential to a low income or disabled customer. Please refer to the response to Polden IR 1.3.2.

The costs associated with the Meter Choices radio-off or legacy meter options have been minimized as a result of BC Hydro's efforts in working with its outsourcing partner, ABSBC, to reorganize its meter reading route structure which also includes utilizing contractors in rural communities. These efforts have helped to enable accurate and timely billing and to preserve the benefits of the theft detection solution of the Smart Metering Program to all customers including those with radio-off or legacy meters. Please refer to response BCUC IR 1.9.2 for rationale for regular meter reading by BC Hydro and why self-reads are not suitable for capture of consumption data.

23.0 Can BC Hydro confirm, for legacy meters, that the Johnson's Landing:

"...*proposal to provide power usage data to BC Hydro would in no way infringe on, change, or replace, the current basic contract each customer has with BC Hydro to supply 120/240 Volt ,60 Cycle electricity*".

RESPONSE:

BC Hydro has no plans to institute a policy of self-reads. Please refer to the response to BCUC IR 1.9.2.

Section 5.1 of the BC Hydro Electric Tariff states as follows:

> **The interval between consecutive meter readings shall be at the sole discretion of BC Hydro.**
>
> **Where the Rate Schedule under which a Customer takes service does not require measurement of the Customer's demand, the meter will normally be read at intervals of two months. Where the Rate Schedule under which a Customer takes service requires measurement of the Customer's demand, the meter or meters will normally be read at intervals of one month.**

24.0 Can BC Hydro confirm, as is the case with the current FortisBC Inc Commission-approved tariff, that BC Hydro has no requirement or stipulation that it has to read the meters itself?

RESPONSE:

BC Hydro does not fully understand the question. Please refer to the response to BCUC IR 1.9.2 for a discussion of BC Hydro's concerns regarding the use of self-reads.

Intervenor Name: Norm Ryder

Information Request To: BC Hydro

BCUC Hearing: Meter Choices Program

Date: 6 November 2013

1. Page 1-2 line 6 “2. the installation of a radio-off meter

   1.1. Has the cost of the purchase of new meters without a radio function in them been factored into the decision and if so what is the cost of meters manufactured with no radios installed in them?

   1.2. With the Radio Transmitter turned off are there any other functions required for the Smart Grid still functioning?

   1.3. When the Radio is turned off can the Smart Meter pulse a signal (infrared or otherwise)?

2. Page 1 -5 Lines 6 &7 “BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion ”

   2.1. Question 3 Will the Smart Grid balance the load to each individual installation, or is the balancing limited to the local area with multiple installations?

3. Page 1-6 Lines 3 & 4 “b) costs incurred with respect to the installation and operation of, and services related to, smart meters from all customers”

   3.1. Question 4 A number of years ago the the basic charge fee (currently $0.1505 a day) was added to the general tariffs to pay for the cost of meter reading and billing. At the time there was considerable comment that a normal company includes the cost of billing in their general fee. Has the approximately $10 per billing period been factored in as a cost the opt-out users are already paying? As meter readers are no longer being used and much of the billing is on line will the basic charge be removed from the bills of customers with Smart Meters?

4. Page 1-5 lines 11-15 “Section 3(2) of the Direction provides that the BCUC must allow BC Hydro to establish a regulatory account for the recovery of “program costs”, “investigation costs” and “infrastructure costs” that are not recovered from customers at premises .....incurred during the period January 1, 2013 to March 31, 2014 ”

   4.1. Opt-out customers were told if they did not want a Smart Meter they would be put at the end of the list until after further discussions with them about Smart Meters were conducted, they were not told the costs of the additional information would be charged to them.

4.2. Why are opt-out customers being threatened with charges retroactively?

4.3. Will the opt-out customers be credited with the savings of not having BCHydro provided and install a Smart Meter?

5. Page 1-5 line 19 “BC Hydro to install legacy meters or radio-off meters for ineligible customers. ”

5.1. Many Customers succumbed to intimidation and pressure tactics and accepted smart meters with out being fully advised of their options by BCHydro. Will these customers be allowed to have the meter of their choice installed?

5.2. Why are these customers that accepted “a modification of their contract” without being made fully aware and equal informed of the facts related to the various concerns about smart meters not eligible for an opt-out?

6. Page 2-3 lines 8-10 “When a customer requested the smart meter installation at their premises be put on hold, a dedicated customer service representative contacted the customer to answer their questions, ”

6.1. Question 10 Why did BCHydro insist that customers with questions look at BCHydro and associated web sites yet when a customer had concerns and questions to be answered and refereed BCHydro to competent web sites BCHydro refused to consider the information – if internet access is appropriate for 1 party to use to communicate their information then it is appropriate for all parties to use to communicate information – why the double standard on the party of BCHydro?

7. Page 2-3 lines 15 -17 “In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

7.1. Question 11 It is reported that in some rural areas the smart grid is not expected to be fully operating for up to 5 years, is that correct?

8. Question 12 Will opt-out customers in areas that do not have a fully operating smart grid be charged the monthly fee?

9. Page 2-8 Lines 12- 16 “In the event of a failed installation, BC Hydro will attempt to contact the customer via telephone to inform the customer that the terms of BC Hydro Electric Tariff require the customer to allow BC Hydro access to its meter installed at the premises. BC Hydro’s disconnection policies and procedures will thereafter apply if the issue of obstruction cannot be resolved.

10. If the customer was not contacted and advised of the Terms of the BCHydro Electric Tariff” why are they now being advised they are subject to the cost retroactively?

10.1. Some opt-out customers have a serious concern about the negative effects of the meters on their health, being forced and coerced into accepting the meters is causing great stress for some, stress that for some on the various disability amounts or GAIN supplement is a serious situation for them when the $35 a month represents 1 1/2 weeks of food, a person should not be required to choose between food or electricity in our society – both are considered a necessity. Both the premier's office and the Minister's office have acknowledged the question of how will low income people be accommodated is a good question, yet have not said how they will accomodate low income people, does BCHydro have a way to accommodate these people?

11. Page 3 -1 lines 4 – 10 “For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter’s components that transmit data by radio are deactivated. Meter data will have to be collected through manual meter data downloads using a tablet computer and a secure optical probe that attaches to the front of the meter. For eligible customers who choose to retain a legacy meter, the meters will have to be read manually at the customer’s premises ”

11.1. For many years BCHydro has allowed people in isolated areas of the province to read their own meter by completing cards with dials to correspond to the meter, BCHydro customers are capable of reading their own meter – completing cards, and mailing them, phoning the reading in or taking pictures of them and emailing or otherwise sending them in, the few that are not can arrange for others to do so for them. Why has this option not been considered?

11.2. Recently a BCHydro rep advised me that the plan was for meters to be read once every 6 months if possible and estimated for the other 2 or more readings. Why is BCHydro attempting to charge for monthly readings when their standard practice has been bi monthly and they are planning to move to semi annually or less?

12. Page 3-1 Lines 12 & 13 “These include costs related to customer account processing, additions and modifications to information technology infrastructure,

12.1. The customer is already paying for account processing in the basic charge fee and the current information technology infrastructure is handling the legacy meters; why and what modifications are required to accommodate the opt-out customers?

13. Page 3-11 lines 7-9 “The higher the smart meter density, the less likely an individual meter will be critical to mesh formation since the mesh can reform using a smart meter that is near the meter that was removed ”

13.1. The prime purpose of a mesh network is to be able to function if one node is taken off line. It is highly unlikely many opt-out customers will be critical to the operation of the mesh network and if a single customer is that critical to the network there are far more serious security and stability issues for BCHydro to deal with than a few opt out customers. It is probable that all the necessary extenders are already installed or planned for those already accepting smart meters that no extenders will be required to accommodate those that opt out. Also those that have chosen to opt-out will occur predominately in clusters and the BCHydro extra extender model is modeled on the widest possible interpretation of the grid by those that are choosing to opt-out. If the grid is operating now with out the opt-out meters why will additional extenders be required?

14. Page 2-16 Lines “9-10 & 19 -22“In a 10 typical year, 150,000 to 300,000 meter seals expired” “Of the approximately 60,000 legacy meters which remain in the field, about 40 per cent have a Measurement Canada seal that has either expired or will expire at the end of calendar 2013. A further 14 per cent will expire by the end of calendar year 2014. ”

14.1. Industry Canada has advised that the legacy meters are approved for 12 years with an additional 10 years because of BCHydro certification procedures. With a current installed base of 1.9 million it would mean approximately 85,000 meter seals would expire a year – allowing for the installed base to have grown considerably in the last 22 years it is not believable that in the last couple of years and next year that over 50% of the seals will have expired. In each of the last 22 years how many meters have been replaced because the meter seal had expired and what was the installed number of meters for that year?

14.2. If the legacy meter has to be replaced because the meter seal has expired why is the customer being charged for a cost that BCHydro would have had to do even if no smart meters were deployed – is that cost not already part of the tariff?

15. Page 3-19 Lines 10-11”FMA will need to continue to visit the customer’s premises every two months to manually download electricity ”

15.1. BCHydro has estimated my meter for the last 6 months, they have not inspected the meter to see if there has been theft of power or evidence of tampering. If they have not been concerned for the last 6 months, what changes on Dec 2, 2013 and suddenly they have concerns that I am tampering with the meter and will need to inspect it every 2 months?

16. Page 3 -28 Lines 12 -15 “Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are

expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers. ”

16.1. Will the Basic charge of 0f $0.1505 be reduced for non opt-out customers, will the current basic fee be considered as part or all of the fees paid by the Opt-out customers?

16.2. A charge of approximately $13.00 for Basic Fee, taxes etc and $70 per billing period when the amount of power used in the same period is less than $30 - a surcharge of almost 300% on top of the power usage charge. is ridiculous and beyond any sense of being appropriate. Why has no consideration into proportioning the fee in relation to the amount of power used been considered?

17. North American Electric Reliability Corporation requirements

17.1. Is the Smart Meter program a requirement ordered or required of BCHydro or provincial government as a requirement to be part of the North American Electric Grid of other out of province organisation?

17.2. Has an outside agency such as the North American Electric Reliability Corporation specified or otherwise instructed BCHydro or the government the opt outs fees to be imposed.

1.0 Page 1-2 line 6 "2. the installation of a radio-off meter

1.1.1 Has the cost of the purchase of new meters without a radio function in them been factored into the decision and if so what is the cost of meters manufactured with no radios installed in them?

RESPONSE:

Yes. The purchase of a relatively low quantity of meters with custom configurations (i.e., without the FAN radio components) would be cost prohibitive due to incremental design and manufacturing costs.

In addition such meters would not be permissible as discussed in the response to BCUC IR 1.7.2.

1.0 Page 1-2 line 6 "2. the installation of a radio-off meter

1.1.2 With the Radio Transmitter turned off are there any other functions required for the Smart Grid still functioning?

RESPONSE:

Yes. All meter data continues to be recorded when the radio is turned off, and this data is used, for example, for energy balance analysis.

Please also refer to the response to CSTS IR 1.86.

1.0 Page 1-2 line 6 "2. the installation of a radio-off meter

1.1.3 When the Radio is turned off can the Smart Meter pulse a signal (infrared or otherwise)?

RESPONSE:

A radio-off meter will not produce any radio transmissions.

Electronic meters, include digital meters, radio-off meters, and smart meters, contains an infrared light-emitting diode (LED) used for Measurement Canada accuracy testing and cannot be turned off.

Old, mechanical meters have a disc that rotates at a speed proportional to the amount of power being consumed. When electronic meters were introduced decades ago, the rotating disc was replaced by an infrared "disc emulator". The disc emulator uses an LED indicator that flashes at a rate proportional to the amount of electricity being used.

2.0 Page 1 -5 Lines 6 &7 "BC Hydro to perform electricity balance analyses for the electric distribution system to better localize sources of electricity diversion "

1.2.1 Will the Smart Grid balance the load to each individual installation, or is the balancing limited to the local area with multiple installations?

RESPONSE:

Typically, electricity balancing will occur for an area of multiple installations.

3.0 Page 1-6 Lines 3 & 4 "b) costs incurred with respect to the installation and operation of, and services related to, smart meters from all customers"

1.3.1 A number of years ago the the basic charge fee (currently $0.1505 a day) was added to the general tariffs to pay for the cost of meter reading and billing. At the time there was considerable comment that a normal company includes the cost of billing in their general fee.
Has the approximately $10 per billing period been factored in as a cost the opt-out users are already paying? As meter readers are no longer being used and much of the billing is on line will the basic charge be removed from the bills of customers with Smart Meters?

RESPONSE:

The basic charge has not been factored into the proposed charges for the Meter Choices Program because it would not be appropriate to do so. The savings resulting from the implementation of the SMI Program (e.g., manual meter reading) are reflected in BC Hydro's revenue requirement. The proposed charges for the Meter Choices Program are based on incremental costs associated with the Meter Choices Program. BC Hydro will address any changes to the basic charge in a future rate design application.

4.0 Page 1-5 lines 11-15 "Section 3(2) of the Direction provides that the BCUC must allow BC Hydro to establish a regulatory account for the recovery of "program costs", "investigation costs" and "infrastructure costs" that are not recovered from customers at premises .....incurred during the period January 1, 2013 to March 31, 2014 "

1.4.1 Opt-out customers were told if they did not want a Smart Meter they would be put at the end of the list until after further discussions with them about Smart Meters were conducted, they were not told the costs of the additional information would be charged to them.

RESPONSE:

No question identified.

4.0 Page 1-5 lines 11-15 "Section 3(2) of the Direction provides that the BCUC must allow BC Hydro to establish a regulatory account for the recovery of "program costs", "investigation costs" and "infrastructure costs" that are not recovered from customers at premises .....incurred during the period January 1, 2013 to March 31, 2014 "

1.4.2 Why are opt-out customers being threatened with charges retroactively?

RESPONSE:

The charges applicable to customers that elect or are deemed to elect the legacy or radio-off meter option will not be applied retroactively. The charge to customers that have elected or deemed to have elected to retain a legacy meter installed at their premises will be applied beginning December 2, 2013. The charges to customers that have elected to have a radio-off meter installed at their premises will be applied beginning April 1, 2014. The failed installation charge became effective as of October 25, 2013 and applies from that date forward.

4.0 Page 1-5 lines 11-15 "Section 3(2) of the Direction provides that the BCUC must allow BC Hydro to establish a regulatory account for the recovery of "program costs", "investigation costs" and "infrastructure costs" that are not recovered from customers at premises .....incurred during the period January 1, 2013 to March 31, 2014 "

1.4.3 Will the opt-out customers be credited with the savings of not having BC Hydro provided and install a Smart Meter?

RESPONSE:

It is BC Hydro's view that there are no material savings and therefore no credit should accrue to customers who retain a legacy meter. Please refer to the response to BCUC IR 1.7.1.

5.0 Page 1-5 line 19 "BC Hydro to install legacy meters or radio-off meters for ineligible customers."

1.5.1 Many Customers succumbed to intimidation and pressure tactics and accepted smart meters with out being fully advised of their options by BC Hydro. Will these customers be allowed to have the meter of their choice installed?

RESPONSE:

As specified in Direction No. 4, only residential customers that do not have a smart meter installed at their premises are eligible for the legacy and radio-off meter options.

5.0 Page 1-5 line 19 "BC Hydro to install legacy meters or radio-off meters for ineligible customers."

1.5.2 Why are these customers that accepted "a modification of their contract" without being made fully aware and equal informed of the facts related to the various concerns about smart meters not eligible for an opt-out?

RESPONSE:

The conditions for retention or installation of legacy meters and radio-off meters are set out in sections 4.2.1 to 4.2.4 of the BC Hydro Electric Tariff as approved by the BCUC in accordance with Direction No. 4. Only residential customers that do not have a smart meter installed at their premises are eligible for the legacy and radio-off meter options. The terms and conditions of the BC Hydro Electric Tariff are binding on BC Hydro.

6.0 Page 2-3 lines 8-10 "When a customer requested the smart meter installation at their premises be put on hold, a dedicated customer service representative contacted the customer to answer their questions, "

1.6.1 Why did BC Hydro insist that customers with questions look at BC Hydro and associated web sites yet when a customer had concerns and questions to be answered and refereed BC Hydro to competent web sites BC Hydro refused to consider the information – if internet access is appropriate for 1 party to use to communicate their information then it is appropriate for all parties to use to communicate information – why the double standard on the party of BC Hydro?

RESPONSE:

BC Hydro declines to provide the requested information on the basis that is not relevant to the scope of this proceeding.

7.0 Page 2-3 lines 15 -17 "In addition, there are about 15,000 smart meter installations that have not been completed for various reasons.

1.7.1 It is reported that in some rural areas the smart grid is not expected to be fully operating for up to 5 years, is that correct?

RESPONSE:

The source and meaning of this assertion is unclear. There are some areas in the BC Hydro service territory that do not have network coverage. However, data from smart meters and radio-off meters will still be collected on a bi-monthly basis, and this data will be used in smart grid applications (e.g., energy balance analysis).

8.0 Will opt-out customers in areas that do not have a fully operating smart grid be charged the monthly fee?

RESPONSE:

Yes. All customers participating in the Meter Choices Program will be required to pay the associated charges.

9.0 Page 2-8 Lines 12- 16 "In the event of a failed installation, BC Hydro will attempt to contact the customer via telephone to inform the customer that the terms of BC Hydro Electric Tariff require the customer to allow BC Hydro access to its meter installed at the premises. BC Hydro's disconnection policies and procedures will thereafter apply if the issue of obstruction cannot be resolved.

RESPONSE:

No question identified.

Page 2-8 Lines 12- 16 "In the event of a failed installation, BC Hydro will attempt to contact the customer via telephone to inform the customer that the terms of BC Hydro Electric Tariff require the customer to allow BC Hydro access to its meter installed at the premises. BC Hydro's disconnection policies and procedures will thereafter apply if the issue of obstruction cannot be resolved.

1.10.0 If the customer was not contacted and advised of the Terms of the BC Hydro Electric Tariff" why are they now being advised they are subject to the cost retroactively?

RESPONSE:

The charges applicable to customers that elect or are deemed to elect the legacy or radio-off meter option will not be applied retroactively. The charge to customers that have elected or deemed to have elected to retain a legacy meter installed at their premises will be applied beginning December 2, 2013. The charges to customers that have elected to have a radio-off meter installed at their premises will be applied beginning April 1, 2014. The failed installation charge became effective as of October 25, 2013 and applies from that date forward.

Page 2-8 Lines 12- 16 “In the event of a failed installation, BC Hydro will attempt to contact the customer via telephone to inform the customer that the terms of BC Hydro Electric Tariff require the customer to allow BC Hydro access to its meter installed at the premises. BC Hydro’s disconnection policies and procedures will thereafter apply if the issue of obstruction cannot be resolved.

1.10.1 **Some opt-out customers have a serious concern about the negative effects of the meters on their health, being forced and coerced into accepting the meters is causing great stress for some, stress that for some on the various disability amounts or GAIN supplement is a serious situation for them when the $35 a month represents 1 ½ weeks of food, a person should not be required to choose between food or electricity in our society – both are considered a necessity. Both the premier's office and the Minister's office have acknowledged the question of how will low income people be accommodated is a good question, yet have not said how they will accomodate low income people, does BC Hydro have a way to accommodate these people?**

RESPONSE:

Please refer to the response to Polden IR 1.3.2.

11.0 Page 3 -1 lines 4 – 10 "For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated. Meter data will have to be collected through manual meter data downloads using a tablet computer and a secure optical probe that attaches to the front of the meter.

For eligible customers who choose to retain a legacy meter, the meters will have to be read manually at the customer's premises "

1.11.1 For many years BC Hydro has allowed people in isolated areas of the province to read their own meter by completing cards with dials to correspond to the meter, BC Hydro customers are capable of reading their own meter – completing cards, and mailing them, phoning the reading in or taking pictures of them and emailing or otherwise sending them in, the few that are not can arrange for others to do so for them. Why has this option not been considered?

RESPONSE:

BC Hydro has no plans to institute a policy of self-reads. Please refer to the response to BCUC IR 1.9.2.

11.0 Page 3 -1 lines 4 – 10 "For eligible customers who choose a radio-off meter, BC Hydro will install an Itron OpenWay meter adjusted so that the meter's components that transmit data by radio are deactivated. Meter data will have to be collected through manual meter data downloads using a tablet computer and a secure optical probe that attaches to the front of the meter.

For eligible customers who choose to retain a legacy meter, the meters will have to be read manually at the customer's premises "

1.11.2 Recently a BC Hydro rep advised me that the plan was for meters to be read once every 6 months if possible and estimated for the other 2 or more readings. Why is BC Hydro attempting to charge for monthly readings when their standard practice has been bi monthly and they are planning to move to semi annually or less?

RESPONSE:

BC Hydro has no plans to read meters at a frequency of every six months. The charges for the Meter Choices Program are based on a bi-monthly meter read.

12.0 Page 3-1 Lines 12 & 13 "These include costs related to customer account processing, additions and modifications to information technology infrastructure,

1.12.1 The customer is already paying for account processing in the basic charge fee and the current information technology infrastructure is handling the legacy meters; why and what modifications are required to accommodate the opt-out customers?

RESPONSE:

The costs to provide the Meter Choices Program are estimated on an incremental basis, and therefore there is no duplication with existing costs. Account processing costs included in the cost model are those costs associated with enrolling a customer in the Meter Choices Program, and have not already been included in the Basic Charge. Account processing costs are described in section 3.4.2.1 of the Application. A description of the Information Technology integration costs is provided in section 3.4.1.2 of the Application.

13.0 Page 3-11 lines 7-9 "The higher the smart meter density, the less likely an individual meter will be critical to mesh formation since the mesh can reform using a smart meter that is near the meter that was removed "

1.13.1 The prime purpose of a mesh network is to be able to function if one node is taken off line. It is highly unlikely many opt-out customers will be critical to the operation of the mesh network and if a single customer is that critical to the network there are far more serious security and stability issues for BC Hydro to deal with than a few opt out customers. It is probable that all the necessary extenders are already installed or planned for those already accepting smart meters that no extenders will be required to accommodate those that opt out. Also those that have chosen to opt-out will occur predominately in clusters and the BC Hydro extra extender model is modeled on the widest possible interpretation of the grid by those that are choosing to opt-out. If the grid is operating now with out the opt-out meters why will additional extenders be required?

RESPONSE:

The FAN network is not currently operating as effectively as it otherwise would given the presence of about 75,000 legacy meters which remain on the system. Estimates of the range extender additions resulting from the Meter Choices Program are based on the expected impact on the mesh network mindful of the various population densities within BC Hydro's service territory.

14.0 Page 2-16 Lines "9-10 & 19 -22"In a 10 typical year, 150,000 to 300,000 meter seals expired" "Of the approximately 60,000 legacy meters which remain in the field, about 40 per cent have a Measurement Canada seal that has either expired or will expire at the end of calendar 2013. A further 14 per cent will expire by the end of calendar year 2014. "

1.14.1 Industry Canada has advised that the legacy meters are approved for 12 years with an additional 10 years because of BC Hydro certification procedures. With a current installed base of 1.9 million it would mean approximately 85,000 meter seals would expire a year –allowing for the installed base to have grown considerably in the last 22 years it is not believable that in the last couple of years and next year that over 50% of the seals will have expired. In each of the last 22 years how many meters have been replaced because the meter seal had expired and what was the installed number of meters for that year?

RESPONSE:

BC Hydro believes the information sought in this question is not relevant to the BCUC's review of the Application. In addition, it would take considerable time and effort to produce the requested 22 years of data. Accordingly, BC Hydro declines to respond to this IR.

14.0 Page 2-16 Lines "9-10 & 19 -22"In a 10 typical year, 150,000 to 300,000 meter seals expired" "Of the approximately 60,000 legacy meters which remain in the field, about 40 per cent have a Measurement Canada seal that has either expired or will expire at the end of calendar 2013. A further 14 per cent will expire by the end of calendar year 2014. "

1.14.2 If the legacy meter has to be replaced because the meter seal has expired why is the customer being charged for a cost that BC Hydro would have had to do even if no smart meters were deployed – is that cost not already part of the tariff?

RESPONSE:

The meter sampling program which was in place prior to the implementation of the SMI Program was terminated, and the associated cost savings were included in the revenue requirement. Therefore, there are no costs associated with legacy meter exchanges in current rates and the incremental costs need to be recovered through the charge to customers with legacy meters.

The new smart meters and radio-off meters have a ten-year Measurement Canada seal and will not need to be exchanged during this period in relation to the seal. The meter sampling program will resume for the smart meters and radio-off meterd in anticipation of meter seal expiry.

15.0 Page 3-19 Lines 10-11"FMA will need to continue to visit the customer's premises every two months to manually download electricity "

1.15.1 BC Hydro has estimated my meter for the last 6 months, they have not inspected the meter to see if there has been theft of power or evidence of tampering. If they have not been concerned for the last 6 months, what changes on Dec 2, 2013 and suddenly they have concerns that I am tampering with the meter and will need to inspect it every 2 months?

RESPONSE:

Due to the reduction in the number of field staff as part of smart metering implementation and the large number of meters still requiring manual reads, BC Hydro has not been able to visit every meter over the last six months. However as the number of meters requiring manual reads is reduced due to conversion to smart meters over the coming months, BC Hydro will increase read frequency (and therefore visual inspection) of those meters requiring manual reads.

16.0 Page 3 -28 Lines 12 -15 "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers. "

1.16.1 Will the Basic charge of 0f $0.1505 be reduced for non opt-out customers, will the current basic fee be considered as part or all of the fees paid by the Opt-out customers?

RESPONSE:

Please refer to the response to Ryder IR 1.3.1.

16.0 Page 3 -28 Lines 12 -15 "Proposed charges have been developed so that the incremental costs related to the Meter Choices Program are expected to be recovered from those customers choosing the option and not from other BC Hydro ratepayers. "

1.16.2 A charge of approximately $13.00 for Basic Fee, taxes etc and $70 per billing period when the amount of power used in the same period is less than $30 - a surcharge of almost 300% on top of the power usage charge. is ridiculous and beyond any sense of being appropriate. Why has no consideration into proportioning the fee in relation to the amount of power used been considered?

RESPONSE:

The incremental costs to provide customers with an alternative to the installation of a smart meter forms the basis of the proposed charges for the Meter Choices Program. The amount of electricity used by a customer has no bearing on these costs and it would not therefore be appropriate to convert a monthly per account charge to a per kWh electricity charge.

17.0 North American Electric Reliability Corporation requirements

1.17.1 Is the Smart Meter program a requirement ordered or required of BCHydro or provincial government as a requirement to be part of the North American Electric Grid of other out of province organisation?

RESPONSE:

No.

17.0 North American Electric Reliability Corporation requirements

1.17.2 Has an outside agency such as the North American Electric Reliability Corporation specified or otherwise instructed BC Hydro or the government the opt outs fees to be imposed

RESPONSE:

No.

Request for Information from BC Hydro re: BC Hydro Smart Meter Choice Program (The Program)

From: Jim Stachow, Intervenor, Ladysmith, BC

Information Request Round 1

6 November 2013

To: BC Hydro

Preface:

My family operates a certified organic blueberry farm at our home where we presently have two BC Hydro accounts metered with analogue meters. My wife and I have been advised in writing by our medical doctor that, due to our pre-existing medical conditions, we not permit smart meters to be installed on our property. Scientific literature suggests wireless smart meter emissions are harmful to bees. Without bees our farm cannot operate. I am very concerned about the privacy, security and fire risk represented by smart meters. The Program proposes that I pay 2 x $35/month, or $840/year to retain my two analogue meters and have them read. These meters are approximately 100 feet apart and easily accessible. I will leave it to the BCUC to determine the reasonableness of our being charged $840/year for a service previously included in our BC Hydro billings, what in the past consisted of six visits to our home per year by BC Hydro meter readers i.e. $70 per visit.

With the foregoing in mind, I respectfully ask the following:

Questions

1. Does BC Hydro undertake to reduce its proposed fees on page 1-3, line 4 if actual expenses of the Program turn out to be less than revenues generated by these fees? If so, please explain how and when this will be carried out.

2. With a view to BC Hydro customer privacy concerns, will BC Hydro commit to never sell, share, give or disseminate in any other way data it acquires from smart meters on the homes of its residential customers? If yes, this might enhance customer acceptance of smart meters, thus reducing the cost of The Program.

3. Did BC Hydro request or suggest, directly or indirectly that the BC Government should issue Direction No. 4 (Appendix B)? If so, please explain how this was done, and why. Direction No. 4 necessarily throttles a more complete investigation of the legitimacy of the fees proposed on page 1-3, line 4.

4. Page 1-3 at lines 10-13 discusses the Failed Installation Charge. I find BC Hydro's definition of this new proposed charge to be highly imprecise and recommend that it be clarified considerably. Numerous times I have informed BC Hydro in writing that I refuse a smart meter. How can I then be

subject to a Failed Installation charge? You already know I don't want a smart meter, so why bother attempting to do so anyway. Is this simply an attempt to frustrate your customers who retain legacy meters? Since you already know I don't want a smart meter, I should be at no risk of being charged this proposed fee, however, as I read The Program, it seems to me that BC Hydro could send a smart meter installer to my home on a daily basis and rack up $65 per visit, all the while knowing that I don't want a smart meter. Why is your definition so imprecise? Can you make it more understandable? Should a person like myself fear that I will be charged a Failed Installation Charge, even though you already know I don't want an smart meter installed?

5. Has BC Hydro made any effort to mitigate/minimize the fees on page 1-3, line 4 ? If so, what other options were considered to keep these proposed fees down? Is there a reason why your customers cannot send you their meter readings online or by phone?

I am out of time. I could ask many more questions and would appreciate the opportunity to do so.

1.0 Does BC Hydro undertake to reduce its proposed fees on page 1-3, line 4 if actual expenses of the Program turn out to be less than revenues generated by these fees? If so, please explain how and when this will be carried out.

RESPONSE:

BC Hydro expects to address any potential changes in the Meter Choices Program charges when it next updates the standard charges in a future next rate design application. Please refer to the response to BCUC IR 1.6.5.2.

2.0 With a view to BC Hydro customer privacy concerns, will BC Hydro commit to never sell, share, give or disseminate in any other way data it acquires from smart meters on the homes of its residential customers? If yes, this might enhance customer acceptance of smart meters, thus reducing the cost of The Program.

RESPONSE:

All of the information BC Hydro collects will continue to be handled in accordance with British Columbia's *Freedom of Information and Protection of Privacy Act*. BC Hydro is prohibited from disclosing personal information to third parties unless required by law.

3.0 Did BC Hydro request or suggest, directly or indirectly that the BC Government should issue Direction No. 4 (Appendix B)? If so, please explain how this was done, and why. Direction No. 4 necessarily throttles a more complete investigation of the legitimacy of the fees proposed on page 1-3, line 4.

RESPONSE:

Any input BC Hydro might have had into the development of Direction No. 4 to the BCUC would be subject to Cabinet privilege, and could not be disclosed.

4.0 Page 1-3 at lines 10-13 discusses the Failed Installation Charge. I find BC Hydro's definition of this new proposed charge to be highly imprecise and recommend that it be clarified considerably. Numerous times I have informed BC Hydro in writing that I refuse a smart meter. How can I then be subject to a Failed Installation charge? You already know I don't want a smart meter, so why bother attempting to do so anyway. Is this simply an attempt to frustrate your customers who retain legacy meters? Since you already know I don't want a smart meter, I should be at no risk of being charged this proposed fee, however, as I read The Program, it seems to me that BC Hydro could send a smart meter installer to my home on a daily basis and rack up $65 per visit, all the while knowing that I don't want a smart meter. Why is your definition so imprecise? Can you make it more understandable? Should a person like myself fear that I will be charged a Failed Installation Charge, even though you already know I don't want an smart meter installed?

RESPONSE:

Please refer to the responses to BCUC IR 1.21.1 and CSTS IR 1.64.

5.0 Has BC Hydro made any effort to mitigate/minimize the fees on page 1-3, line 4? If so, what other options were considered to keep these proposed fees down? Is there a reason why your customers cannot send you their meter readings online or by phone?

RESPONSE:

In BC Hydro's view, the cost estimates included in the Meter Choices Application are necessary and reasonable.

Please also refer to the response to BCUC IR 1.9.2.

Intervenor Name: David Wong

Information Request To: BC Hydro

BCUC Hearing: Meter Choices Program

Date: 6 November 2013

1. Please file a copy of the "Smart Metering & Infrastructure Business Case".

   1.1 Please confirm that the business case makes no allowance for the costs associated with the "Meter Choices Program". If not confirmed, please indicate where in the business case such costs are included.

   1.2 On pages 11-13 of the business case, BC Hydro outlines "Lessons Learned from Other Jurisdictions". On the bottom of page 11, BC Hydro states that "By adopting smart meters after learning from the experience of other utilities, BC Hydro has the advantage of knowing what factors contribute to successful implementation …". Please confirm that customer resistance to the installation of smart meters was one of the factors that some other utilities experienced.

   1.3 In general, the later in a capital project that changes are introduced, the higher the cost of those changes. Please confirm that if the "Meter Choices Program" had been included in the original capital project, the incremental costs associated with this program would be lower.

   1.4 Please provide revised estimated costs tables in section 3.4 of the Application based on the costs that would have been incurred had the "Meter Choices Program" been designed into the original smart meter program and incorporated in the original business case.

   1.5 Does BC Hydro believe that customers who elect to retain a legacy meter or a radio-off meter should be responsible for any additional "Meter Choices Program" costs associated with the fact that BC Hydro did not consider this program in the original design and business case?

2. In Table 3-3 of the Application, under capital costs, there does not appear to be any capital cost adjustment related to the avoided or deferred cost to BC Hydro related to the purchase of smart meters for those applicable customers who elect a legacy meter.

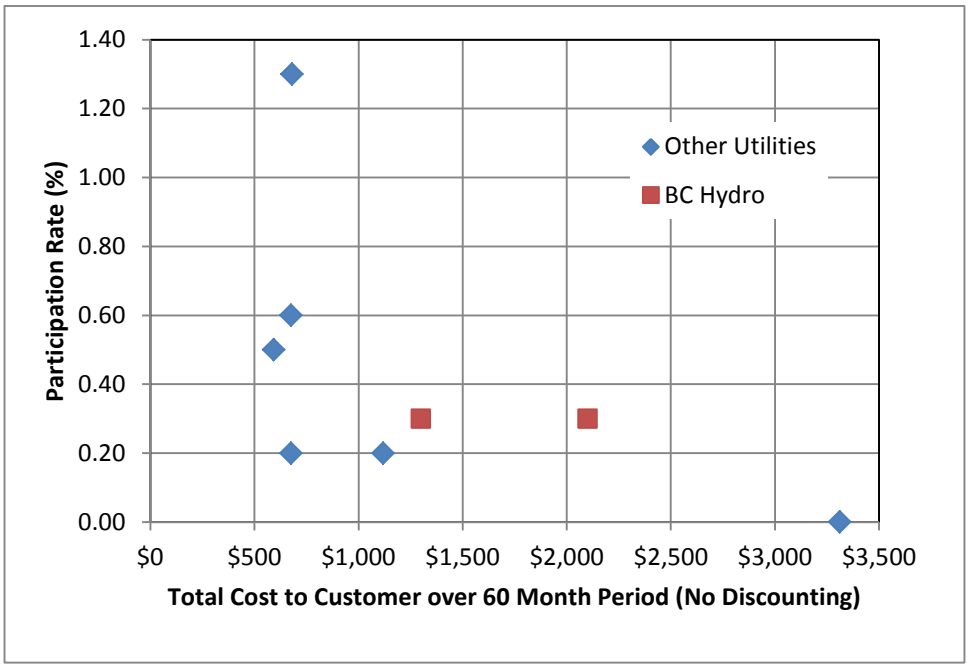
   2.1 Please confirm that this capital cost adjustment has not been included in BC Hydro's Application.

   2.2 Based on the cost to BC Hydro of an individual residential smart meter, and assuming an 8% discount rate (as was used in the business case – see page 31), please calculate the annual avoided or deferred capital cost that should accrue to the benefit of an applicable customer if they elect to retain a legacy meter.

3. The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

Utility	Initial Charge ($) (A)	Monthly Charge ($) (B)	Total Cost (Assuming 60 Month Customer Election Period) (A) + 60 x (B)	Participation Rate (%)
PG&E	75	10	675	0.6
SDG&E	75	10	675	0.2
CMP	20	11	680	1.3
PGE	251	51	3311	0
NVE	53	9	593	0.5
HQ	98	17	1118	0.2
BCH - legacy	0	35	2100	0.3
BCH - radio off	100	20	1300	0.3

This data has been plotted in the following graph:



3.1 Please confirm that, assuming legacy meters remain available, a customer choosing to retain a legacy meter would pay a total of $2100 over a five year period, and that this cost would be in addition to the energy and connection charges for which they would also be responsible.

3.2 Will either or both PST and GST apply to the proposed "Meter Choices Program" charges?

3.3 The graph of participation rate versus total cost is an example of a price versus demand curve (with scatter), and shows generally higher participation rates with lower total costs and vice versa. (Note that the shape of the graph is not significantly impacted by the length of the period selected, since the majority of the total cost comes from the monthly charge.) Does BC Hydro believe that the participation rate in the "Meter Choice Program" will be in part a function of the total cost to the customer?

3.4 If the response to 3.3 is affirmative, has BC Hydro estimated the cost or charge versus participation rate function or obtained one from another utility? If so, please provide it.

3.5 Relative to the other utilities, BC Hydro's proposed total cost relative to the participation rate appears to be above the demand curve constructed from the outcomes observed by other utilities, suggesting that a 0.1% participation rate might be a better forecast. Does BC Hydro believe that there are other factors that will lead to a higher participation rate relative to total cost than other utilities have experienced? If so, please explain.

3.6 Please provide an alternative version of Table 3-1 based on the assumption of a 0.1% participation rate.

3.7 In what ways is BC Hydro learning from the experience of other utilities to take advantage of knowing what factors contribute to successful implementation in developing the "Meter Choice Program"?

4. In section 3.4.2.6 of the Application, BC Hydro deals with the issue of legacy meter exchanges.

4.1 What is the smallest size of residential meter group, as the term is used on page 3-16, line 11 of the Application, that BC Hydro has had in installed service over the last 15 years?

4.2 Some applicable customers who elect to retain a legacy meter may do so for privacy reasons related to the collection of significantly more detailed consumption information in the smart meters. Given that under the proposed charge schedule, such customers will spend more than $2000 over a five-year period, would BC Hydro consider purchasing additional analog meters to serve these customers?

4.3 Does BC Hydro believe that the BCUC has the authority to order BC Hydro to purchase additional analog meters to serve these customers?

4.4 Please confirm that an applicable customer who has elected to retain a legacy meter can make a one-time election to have a smart meter installed at any time during the duration of the "Meter Choices Program", and that assuming there is no failed installation, there will be no charge for this election.

5. Regulation 368/2010, attached to the Application as Appendix A, states:

3 (1) "… by the end of the 2012 calendar year, the authority must install and put into operation
(a) a smart meter for each eligible premises …"
where eligible premises "means a building, structure, or equipment of a customer of the authority if the building, structure, or equipment is connected to the electric distribution system and has an electricity meter, but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter".

Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

5.1 Does BC Hydro consider the request from a customer for a meter exchange to be "put on hold" to meet the criteria of a situation where it is impracticable to install a smart meter?

5.2 If not, was BC Hydro provided relief from this regulation?

5.3 If so, please provide the documentation related to this relief.

5.4 If neither of the above, is BC Hydro in contravention of this regulation, and if so, what consequence(s) has it suffered, or will it suffer, as a result?

5.5 Does BC Hydro believe that customer requests for meter exchanges "to be put on hold" has adversely impacted its ability to implement the overall smart meter program in a timely and cost effective manner?

5.6 If so, please estimate the length of the delay and the associated cost, and explain why no request has been made to the BCUC to recover this additional program delay cost from those customers who have requested meter exchanges "to be put on hold".

1.0 Please file a copy of the "Smart Metering & Infrastructure Business Case".

RESPONSE:

Please refer to the response to CEC IR 1.7.1.

1.1.1 Please confirm that the business case makes no allowance for the costs associated with the "Meter Choices Program". If not confirmed, please indicate where in the business case such costs are included.

RESPONSE:

Confirmed. The business case makes no allowance for the costs or revenues associated with the Meter Choices Program.

1.1.2 On pages 11-13 of the business case, BC Hydro outlines "Lessons Learned from Other Jurisdictions". On the bottom of page 11, BC Hydro states that "By adopting smart meters after learning from the experience of other utilities, BC Hydro has the advantage of knowing what factors contribute to successful implementation …". Please confirm that customer resistance to the installation of smart meters was one of the factors that some other utilities experienced.

RESPONSE:

Confirmed, however there was no significant resistance to smart meters until after the BC Hydro SMI Program business case was finalised in January 2011.

1.1.3 In general, the later in a capital project that changes are introduced, the higher the cost of those changes. Please confirm that if the "Meter Choices Program" had been included in the original capital project, the incremental costs associated with this program would be lower.

RESPONSE:

It is not possible to determine what the costs might have been under this hypothetical scenario.

1.1.4 Please provide revised estimated costs tables in section 3.4 of the Application based on the costs that would have been incurred had the "Meter Choices Program" been designed into the original smart meter program and incorporated in the original business case.

RESPONSE:

It is not possible to determine what the costs might have been under this hypothetical scenario.

1.1.5 Does BC Hydro believe that customers who elect to retain a legacy meter or a radio-off meter should be responsible for any additional "Meter Choices Program" costs associated with the fact that BC Hydro did not consider this program in the original design and business case?

RESPONSE:

BC Hydro believes the charges it has proposed in the Application are in accordance with the requirements of Direction No. 4 to the BCUC, a copy of which is included with the Application as Appendix B.

2.0 In Table 3-3 of the Application, under capital costs, there does not appear to be any capital cost adjustment related to the avoided or deferred cost to BC Hydro related to the purchase of smart meters for those applicable customers who elect a legacy meter.

1.2.1 Please confirm that this capital cost adjustment has not been included in BC Hydro's Application.

RESPONSE:

Confirmed.

2.0 In Table 3-3 of the Application, under capital costs, there does not appear to be any capital cost adjustment related to the avoided or deferred cost to BC Hydro related to the purchase of smart meters for those applicable customers who elect a legacy meter.

1.2.2 Based on the cost to BC Hydro of an individual residential smart meter, and assuming an 8% discount rate (as was used in the business case – see page 31), please calculate the annual avoided or deferred capital cost that should accrue to the benefit of an applicable customer if they elect to retain a legacy meter.

RESPONSE:

It is BC Hydro's view that there are no material savings and no credit should accrue to customers who retain a legacy meter. Please refer to the response to BCUC IR 1.7.1.

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

Utility	Initial Charge ($) (A)	Monthly Charge ($) (B)	Total Cost (Assuming 60 Month Customer Election Period) (A) + 60 x (B)	Participation Rate (%)
PG&E	75	10	675	0.6
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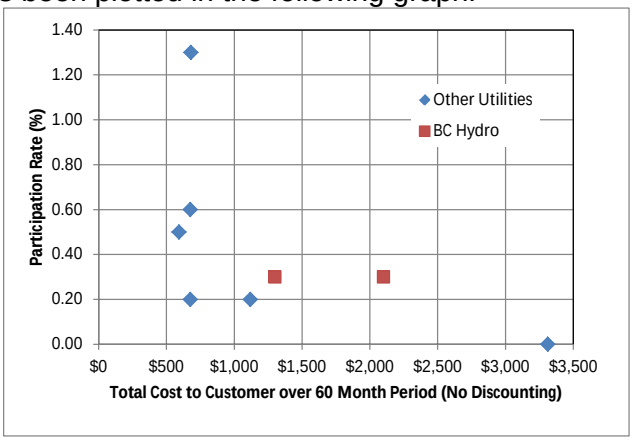

1.3.1 Please confirm that, assuming legacy meters remain available, a customer choosing to retain a legacy meter would pay a total of $2100 over a five year period, and that this cost would be in addition to the energy and connection charges for which they would also be responsible.

RESPONSE:

Confirmed. If the proposed charge for the legacy meter option of $35 per month is approved, and assuming there is sufficient inventory over the 5 year period, total charges over 5 years would be $2,100 (i.e., $35 x 12 x 5).

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

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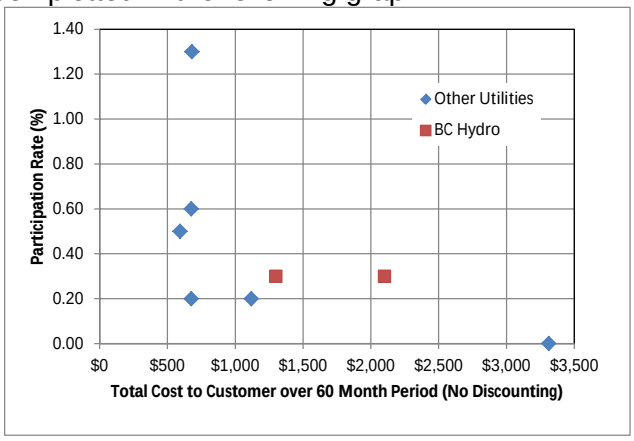

1.3.2 Will either or both PST and GST apply to the proposed "Meter Choices Program" charges?

RESPONSE:

GST will apply to the miscellaneous charges for the Meter Choices Program.

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

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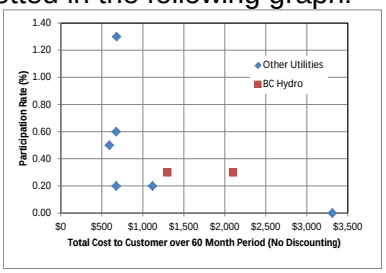
BCH - radio off	100	20	1300	0.3

This data has been plotted in the following graph:



1.3.3 The graph of participation rate versus total cost is an example of a price versus demand curve (with scatter), and shows generally higher participation rates with lower total costs and vice versa. (Note that the shape of the graph is not significantly impacted by the length of the period selected, since the majority of the total cost comes from the monthly charge.) Does BC Hydro believe that the participation rate in the "Meter Choice Program" will be in part a function of the total cost to the customer?

RESPONSE:

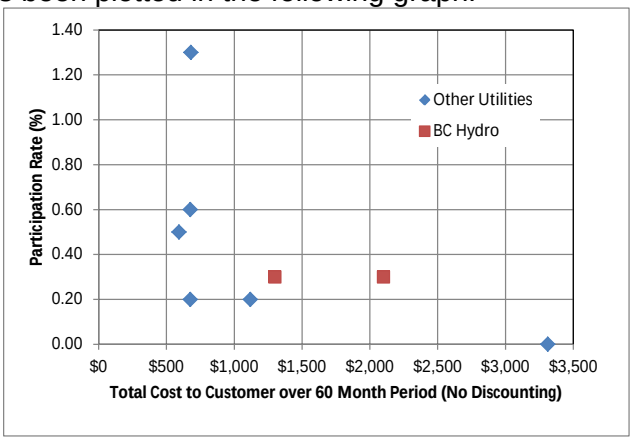
It is BC Hydro's view that standard charges for the Meter Choices Program would factor into a customer's decision to participate in the program.

Please also refer to the response to BCUC IRs 1.2.4 and 1.6.3.

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

Utility	Initial Charge ($) (A)	Monthly Charge ($) (B)	Total Cost (Assuming 60 Month Customer Election Period) (A) + 60 x (B)	Participation Rate (%)
PG&E	75	10	675	0.6
SDG&E	75	10	675	0.2
CMP	20	11	680	1.3
PGE	251	51	3311	0
NVE	53	9	593	0.5
HQ	98	17	1118	0.2
BCH - legacy	0	35	2100	0.3
BCH - radio off	100	20	1300	0.3

This data has been plotted in the following graph:



1.3.4 If the response to 3.3 is affirmative, has BC Hydro estimated the cost or charge versus participation rate function or obtained one from another utility? If so, please provide it.

RESPONSE:

BC Hydro has not estimated the demand response to varying charges, due to a lack of empirical data which could be used in such an estimate.

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

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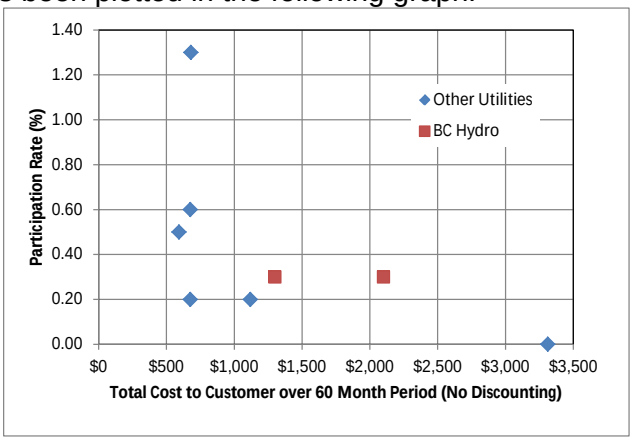

1.3.5 Relative to the other utilities, BC Hydro's proposed total cost relative to the participation rate appears to be above the demand curve constructed from the outcomes observed by other utilities, suggesting that a 0.1% participation rate might be a better forecast. Does BC Hydro believe that there are other factors that will lead to a higher participation rate relative to total cost than other utilities have experienced? If so, please explain.

RESPONSE:

As indicated in section 3.3 of the Application (page 3-3):

> **Participation rates in other jurisdictions offering customers an alternative to a smart meter installation may be of some assistance, but their usefulness would be limited due to potential differences in program characteristics (e.g., cost to customer, types of alternatives offered, etc.) and to the fact that most of these alternative installation programs are in a relatively early stage of implementation and a "steady state" level of customer participation is not known. It is noted however that a review of the available information from other jurisdictions suggests that participation rates vary significantly, appear to be negatively correlated with the level of charges to customers for smart meter alternatives, and may decline over time from initial levels.**

Further, it is BC Hydro's view that in addition to standard charges a customer's decision to participate in the Meter Choices Program would depend on other factors including level of family income and the perceived value of the alternatives to a smart meter installation.

Please also refer to the responses to BCUC IRs 1.2.4 and 1.6.3.

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

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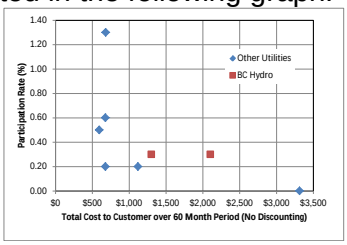

1.3.6 Please provide an alternative version of Table 3-1 based on the assumption of a 0.1% participation rate.

RESPONSE:

Table 3-1 cannot be reproduced using a participation rate of 0.1 per cent without a great deal of further analysis and additional work effort. In BC Hydro's view, the range of participation levels provided in the Application is representative of the likely range of outcomes and participation rate scenarios, in addition to those provided in the Application and in the response to BCUC IR 1.6.2, would not be particularly informative.

Please refer to the response to BCUC IR 1.6.2.1 for estimates assuming 3,300 to 8,300 customers choose to participate in the Meter Choices Program.

3.0 The following table is drawn from Table 3-2 of the Application. The total cost (column C) assumes that an applicable customer elects to participate in each program for 5 years, with no discounting monthly payments to present value. Two rows have been added to the table to show BC Hydro's proposed customer costs, as given in Table 3-1. BC Hydro's participation rate of 0.3% is based on the 5000 legacy meter and 5000 radio-off meter participation assumptions used by BC Hydro (page 3-4, lines 3 through 8 of the Application).

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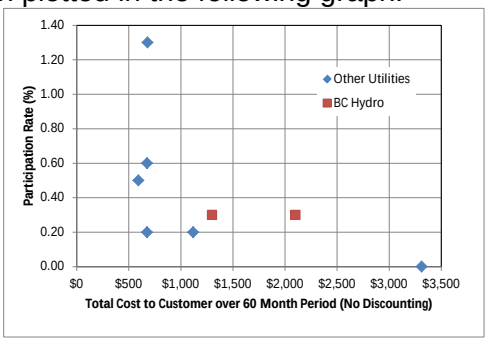

1.3.7 In what ways is BC Hydro learning from the experience of other utilities to take advantage of knowing what factors contribute to successful implementation in developing the "Meter Choice Program"?

RESPONSE:

Each of the main elements of the Meter Choices Program is required by Direction No. 4 or by the BCUC orders issued in accordance with Direction No. 4.

4.0 In section 3.4.2.6 of the Application, BC Hydro deals with the issue of legacy meter exchanges.

1.4.1 What is the smallest size of residential meter group, as the term is used on page 3-16, line 11 of the Application, that BC Hydro has had in installed service over the last 15 years?

RESPONSE:

The smallest sample size was in the order of 100 meters.

4.0 In section 3.4.2.6 of the Application, BC Hydro deals with the issue of legacy meter exchanges.

1.4.2 Some applicable customers who elect to retain a legacy meter may do so for privacy reasons related to the collection of significantly more detailed consumption information in the smart meters. Given that under the proposed charge schedule, such customers will spend more than $2000 over a five-year period, would BC Hydro consider purchasing additional analog meters to serve these customers?

RESPONSE:

No additional legacy meters will be purchased.

4.0 In section 3.4.2.6 of the Application, BC Hydro deals with the issue of legacy meter exchanges.

1.4.3 Does BC Hydro believe that the BCUC has the authority to order BC Hydro to purchase additional analog meters to serve these customers?

RESPONSE:

No.

4.0 In section 3.4.2.6 of the Application, BC Hydro deals with the issue of legacy meter exchanges.

1.4.4 Please confirm that an applicable customer who has elected to retain a legacy meter can make a one-time election to have a smart meter installed at any time during the duration of the "Meter Choices Program", and that assuming there is no failed installation, there will be no charge for this election.

RESPONSE:

Confirmed.

5.0 Regulation 368/2010, attached to the Application as Appendix A, states:

3(1) "… by the end of the 2012 calendar year, the authority must install and put into operation

(a) a smart meter for each eligible premises …"

where eligible premises "means a building, structure, or equipment of a customer of the authority if the building, structure, or equipment is connected to the electric distribution system and has an electricity meter, but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter".

Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

1.5.1 Does BC Hydro consider the request from a customer for a meter exchange to be "put on hold" to meet the criteria of a situation where it is impracticable to install a smart meter?

RESPONSE:

The definition of "eligible premises" in the Smart Meters and Smart Grid Regulation was amended by B.C. Reg. 405/2012 dated December 27, 2012 to add the language "but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter". BC Hydro understands that this language was added to the Regulation at that time to provide relief to BC Hydro in relation to the end of calendar year 2012 deadline for the installation of smart meters not yet completed, not in relation to the overall Smart Meter Program.

Direction No. 4 to the BCUC and the BCUC orders issued pursuant to it, prescribe BC Hydro's ongoing obligations in relation to installing and allowing to remain in place smart meters, legacy meters and radio-off meters.

5.0 Regulation 368/2010, attached to the Application as Appendix A, states:

3(1) "… by the end of the 2012 calendar year, the authority must install and put into operation

(a) a smart meter for each eligible premises …"

where eligible premises "means a building, structure, or equipment of a customer of the authority if the building, structure, or equipment is connected to the electric distribution system and has an electricity meter, but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter".

Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

1.5.2 If not, was BC Hydro provided relief from this regulation?

RESPONSE:

Please refer to the response to Wong IR 1.5.1.

5.0 Regulation 368/2010, attached to the Application as Appendix A, states:

3(1) "… by the end of the 2012 calendar year, the authority must install and put into operation

(a) a smart meter for each eligible premises …"

where eligible premises "means a building, structure, or equipment of a customer of the authority if the building, structure, or equipment is connected to the electric distribution system and has an electricity meter, but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter".

Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

1.5.3 If so, please provide the documentation related to this relief.

RESPONSE:

Please refer to the response to Wong IR 1.5.1.

5.0 Regulation 368/2010, attached to the Application as Appendix A, states:

3(1) "… by the end of the 2012 calendar year, the authority must install and put into operation

(a) a smart meter for each eligible premises …"

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Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

1.5.4 If neither of the above, is BC Hydro in contravention of this regulation, and if so, what consequence(s) has it suffered, or will it suffer, as a result?

RESPONSE:

Please refer to the response to Wong IR 1.5.1 which describes the documented relief BC Hydro has been provided.

5.0 Regulation 368/2010, attached to the Application as Appendix A, states:

3(1) "… by the end of the 2012 calendar year, the authority must install and put into operation

(a) a smart meter for each eligible premises …"

where eligible premises "means a building, structure, or equipment of a customer of the authority if the building, structure, or equipment is connected to the electric distribution system and has an electricity meter, but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter".

Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

1.5.5 Does BC Hydro believe that customer requests for meter exchanges "to be put on hold" has adversely impacted its ability to implement the overall smart meter program in a timely and cost effective manner?

RESPONSE:

Yes, the SMI program has been delayed, and additional costs have been incurred, as a result of customers requesting their Smart Meter installation 'be put on hold'.

5.0 Regulation 368/2010, attached to the Application as Appendix A, states:

3(1) "… by the end of the 2012 calendar year, the authority must install and put into operation

(a) a smart meter for each eligible premises …"

where eligible premises "means a building, structure, or equipment of a customer of the authority if the building, structure, or equipment is connected to the electric distribution system and has an electricity meter, but does not include a building, structure or equipment where it is impracticable for the authority to install a smart meter".

Clearly this requirement has not been met by BC Hydro, since in the Application it states that as of October 2013, 75,000 customers do not yet have smart meters (page 2-3, lines 14 through 17).

1.5.6 If so, please estimate the length of the delay and the associated cost, and explain why no request has been made to the BCUC to recover this additional program delay cost from those customers who have requested meter exchanges "to be put on hold".

RESPONSE:

Smart meter installation refusals have or will result in several project cost and schedule implications, including:

- **Need for additional network infrastructure (specifically routers and range extenders) in order to allow the smart meters already deployed to communicate**
- **Increased smart meter installation costs. BC Hydro incurred an "Unable to Complete" charge for many refusals, and subsequent smart meter installations must be completed outside of mass deployment efforts.**
- **Extension of Call Centre staffing to continue dialogue with customers who refused a smart meter installation**
- **Extension of costs associated with management, planning and overhead of metering system deployment**
- **Extension of the duration of network optimization activities**

Capital cost impacts are estimated at $18.5 million. There are also operating cost impacts prior to December 2, 2013 (when the legacy meter charge becomes effective) due to the manual reading of legacy meters and non-communicating smart meters attributable to the continued presence of legacy meters. These capital and operating costs do not include the cost of offering the Meter Choices Program.

BC Hydro was able to accommodate both capital cost and schedule impacts within the overall SMI Program work plan and budget by realigning delayed work with work left to complete and utilizing project contingency, which is specifically designed to handle unforeseen circumstances.

Directive No. 4 to BCUC, permits program delay costs to be recorded in the SMI Regulatory Account and recovered as part of the SMI Program cost.