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October 26, 2012

VIA ELECTRONIC MAIL

British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Erica M. Hamilton, Commission Secretary

Dear Sirs/Mesdames:

Re: FortisBC Inc. Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project ~ Project No. 3698682

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 Requests has also been forwarded to FortisBC and registered interveners by e-mail.

If you have any questions regarding the foregoing, please do not hesitate to contact the undersigned.

Yours truly,

OWEN BIRD LAW CORPORATION

Christopher P. Weafer
CPW/jlb
cc: CEC
cc: FortisBC Inc.
cc: Registered Interveners

COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BRITISH COLUMBIA ("CEC")

Information Request No. 1

FortisBC Inc. Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project Project No.3698682

1.0 Reference: Exhibit B-1, Application, Page 25 and Exhibit B-1, Application, Page 30 and Exhibit B-1, Application, Page 40

FortisBC's evolutionary vision of a smart grid is to build upon a foundation of existing infrastructure to ensure a safe, reliable, cost-effective and environmentally-friendly electrical system which facilitates active customer participation, meets future demands and supports public policies and regulations.

The technology of AMI is a fundamental prerequisite for FortisBC's smart grid vision since it includes deployment of a widespread communication network throughout the Company's service territory. The new network infrastructure associated with AMI has the potential to change the way that FortisBC operates its distribution infrastructure and how the Company interacts with its customers, and will help prepare the electrical infrastructure for new customer loads and technologies such as distributed generation and plug-in hybrid electric vehicles.

- Install approximately 115,000 residential and commercial AMI meters capable of remote connection and disconnection of electric service;

1.1 Please confirm that in implementing AMI, FortisBC is achieving two outcomes:

a) A transition to communicating digital meters, which can be expected to continue indefinitely, and

b) Specific physical implementation of 115,000 meters with an expected life of 20 years.

2.0 Reference: Exhibit B-6, BCUC 1.1.1

The Company has no current plan to complete a new depreciation study. However, the Company depreciation expert Gannett Fleming estimates that rates calculated in the most recent depreciation study are reasonable for a period of three to five years. As such, FortisBC will address the matter of a new depreciation study as part of a future revenue requirements application using year-end plant in service data from the year prior to that in which the study is conducted.

2.1 What changes would have to occur so that FortisBC would believe the existing depreciation rate was no longer reasonable?

3.0 Reference: Exhibit B-6, BCUC 1.1.1.1

Would Fortis BC consider not revising the depreciation rate and continuing with 5 percent over the 20-year period?

18 Yes.

3.1 What advantages and disadvantages does FortisBC see in having the depreciation rate stay stable at 5% over 20 years?

4.0 Reference: Exhibit B-6, BCUC 1.1.2 and Exhibit B-6, BCUC 1.46.1, Table 46.1

23 Due to contractual sensitivities, information regarding the applicable warranties has been filed
24 with the Commission in confidence.

Failures in integration work	1	4	Warranties related to equipment, software and all aspects of system performance are included in the contract.

4.1 Is FortisBC specifically prohibited by contract from providing certain information about warranties in the contract?

4.1.1 If so, what types of information may not be made public?

4.1.2 If not, how has FortisBC determined what information is confidential and please provide a list of the types of information.

4.2 Does Itron make any warranties regarding the life of the equipment provided?

5.0 Reference: Exhibit B-6, BCUC 1.1.2

25 Itron CENTRON OpenWay meters are designed to have a service life of 20 years. Accelerated
26 life testing performed by Itron on CENTRON OpenWay meters suggests that the great majority
27 of those meters will last to or beyond the 20-year design life. Please also refer to the response
28 to BCUC IR1 Q69.1.

5.1 Please explain if 'designed to have a service life of 20 years' refers strictly to functionality or whether this addresses the technologically useful life and/or economically useful life?

5.2 Is 20 years typical of the service life of other digital meters?

6.0 Reference: Exhibit B-6, BCUC 1.1.2 and Exhibit B-6, BCUC 1.69.1

25 Itron CENTRON OpenWay meters are designed to have a service life of 20 years. Accelerated
26 life testing performed by Itron on CENTRON OpenWay meters suggests that the great majority
27 of those meters will last to or beyond the 20-year design life. Please also refer to the response
28 to BCUC IR1 Q69.1.

Meter Life Expectancy
Many meters will last beyond their 15 or 20 year life expectancy. Each stress test lasts the equivalent of the product lifespan. The tests show that the product must maintain a <= 0.5% yearly failure rate over the product life expectancy. In other words, if we have 0.5% * 20 years = 10% of the meters can fail, but 90% are still operational. From the accelerated life testing, we calculate what the yearly failure rate; we can validate that the failure rate is less than the 0.5%.

6.1 Please confirm that over 90% of the meters can be expected to last 20 years or beyond?

6.2 Can Itron or others specify what the estimated failure rate is based on their testing?

6.2.1 If so, what is it?

6.3 Is there a price premium associated with longevity? For example, are there Smart Meters available that have equivalent functionality, at a cheaper price, that are designed with a shorter lifespan?

7.0 Reference: Exhibit B-6, BCUC 1.3.1

FortisBC must decide prior to August 1, 2013 whether to proceed with the Itron contract. FortisBC may exit the contract prior to that date if it does not receive a decision or if it receives a decision with conditions that are unacceptable to the Company.

FortisBC is requesting a decision by July 20, 2013 in order to provide sufficient time for the Company to evaluate the decision prior to August 1, 2013.

The contract does not contemplate, 1) FortisBC failure to exit the contract prior to August 1, 2013 without proceeding with the contract after that date or 2) renegotiating any terms of the contract prior to August 1, 2013. The outcome in both of these circumstances is therefore uncertain.

7.1 Please confirm that there are no penalties associated with FortisBC exiting the contract prior to August 1, 2013.

7.2 Are there other conditions by which FortisBC may exit the contract beyond either not receiving a decision or receiving a decision with conditions that are unacceptable to the company?

7.3 What conditions would FortisBC contemplate as being either acceptable or unacceptable to the Company?

7.4 Please confirm that if FortisBC fails to exit the contract prior to August 1, 2013 it remains contracted to proceed under the existing terms of the contract?

7.5 Is FortisBC contracted to minimum numbers of smart meters and other equipment to be purchased and/or installed over a certain period of time? If so, please provide the minimum numbers of each type of equipment FortisBC is contracted to purchase/install and over what period of time.

8.0 Reference: Exhibit B-6, BCUC 1.3.1

Approximately $21 million of total project costs relate to the Itron contract for AMI – including unit costs for meters and network devices, software, and contract costs for professional services. The contract was negotiated in 2011, and prices will be held firm provided that FortisBC receives CPCN approval and agrees to any conditions contained in the BCUC decision by August 1, 2013.

8.1 Are there portions of the contract with Itron in which the prices will not be held firm?

8.2 In the event that prices decline, is there any mechanism by which FortisBC can capitalize on the reduced prices?

9.0 Reference: Exhibit B-6, BCUC 1.3.1

Internal costs will be impacted by a delay in project start since staff continuity cannot be assured. These costs cannot easily be quantified, but relate to sourcing, obtaining, training and orienting new project personnel after a positive decision for the project is obtained.

Itron has experienced resources available in British Columbia until mid-2013 that could be quickly deployed to the FortisBC project, which would help ensure the project schedule was met and capitalize upon the synergies of implementing FortisBC's AMI project near the time of BC Hydro's Smart Metering implementation.

9.1 What is the maximum delay that FortisBC could expect to reasonably accommodate without impacting internal costs?

9.2 Can internal costs potentially be reduced by proceeding more quickly than anticipated in the application?

9.3 Specifically what experienced Itron resources are available in British Columbia until mid-2013 that would help ensure the project schedule was met?

9.4 What is the anticipated cost savings or other advantages that would accrue from utilizing these resources?

9.5 What constitutes 'near the time of BC Hydro's Smart metering implementation'?

9.6 Please confirm that the above statement contemplates a timing in which the Itron resources being deployed have completed their work with BC Hydro SMI project and then move to commence work with the FortisBC project.

9.7 If not, is there expected overlap and over what period of time?

9.8 If the final completion date of the BC Hydro SMI project were delayed for any reason, would FortisBC consider delaying the AMI project?

9.8.1 If not, what impact would that have on the ability of FortisBC to capitalize on the resources and synergies of implementing immediately after the BC Hydro project?

10.0 Reference: Exhibit B-1, Application, Page 1

8 The FortisBC AMI Project is consistent with provincial government policy. The *Clean*
9 *Energy Act* directly supports the implementation of "smart metering" and "smart grid"
10 technologies, and the Project proposed in this Application is consistent with the regulations
11 made pursuant to the Act.

10.1 Has FortisBC considered the possible impact of a change of provincial government policy on legislation affecting smart meters?

10.1.1 If so, what changes could FortisBC anticipate that might be problematic?

11.0 Reference: Exhibit B-6, BCUC 4.1.1

Festival Hydro Inc.	Y			
FortisBC	Y			
Greater Sudbury Hydro Inc.	Y	Y	Y	Y
Grimsby Power Incorporated (FortisON)	Y	Y	Y	Y

11.1 Does FortisBC anticipate using Util-Assist Inc. for purposes other than procurement such as Implementation and Project Management, Business Process Development or Testing?

11.2 If so, has FortisBC entered into any further agreements with Util-Assist Inc?

12.0 Reference: Exhibit B-6, BCUC 1.6.1

2 FortisBC confirms that electro-mechanical meters are no longer available to be purchased new
3 on the market from the two main meter manufacturing venders currently being used - Itron and
4 Elster.

12.1 Please confirm that 'currently being used' means currently being used by FortisBC.

12.2 Are there other vendors supplying new electro-mechanical meters in North America?

12.2.1 If so, please identify those vendors and the products available.

12.2.2 How long might these vendors be expected to keep manufacturing electro-mechanical meters?

12.3 Please identify when Itron and Elster stopped manufacturing new electro-mechanical meters.

12.4 When is the conversion of the market to digital meters expected to be nearly permanent in FortisBC's estimation? Can this be expected to occur within the next 5, 10, 15 or 20 years?

13.0 Reference: Exhibit B-6, BCUC 1.6.5.1

7 This alternative has not been pursued as it would negate much of the benefit of an AMI system.
8 For example, the main financial benefits of an AMI system – decreasing meter reading costs
9 and reducing theft – both require a full deployment of AMI meters in an area to be realised.
10 Since the current digital meters are not concentrated in a geographical area, these efficiencies
11 would not be realised across the entire FortisBC service area.

13.1 Please confirm that 'full deployment' with respect to reducing theft refers to 100%, and that 100% deployment of AMI is required in order for the maximum theft reduction benefits to be realized.

13.2 If deployment is less than 100% will the theft reduction benefits to be realized be diminished from the maximum?

13.2.1 Please provide the curve/scale at which theft reduction benefits can be realized in relation to the proportion of deployment.

13.3 At what level of deployment does FortisBC estimate that it would be unable to achieve 80% and 50% of the theft reduction benefits respectively?

13.4 Please confirm that 'full deployment' with respect to decreasing meter reading costs refers to 100% deployment.

14.0 Reference: Exhibit B-6, BCUC 1.6.8

14 If FortisBC did apply for temporary permission pursuant to the Measurement Canada Policy on
15 Granting Temporary Permission to Use Electricity Meters Without Reverification, it would not be
16 without cost. The policy states that an electricity contractor must:

17 a. ensure that the integrity and accuracy of electricity meters are maintained;

18 b. provide objective evidence to support a decision to keep electricity meters in
19 service without reverifying the subject meter types, models and/or groups of
20 meters; and

21 c. provide a plan that will include conditions to mitigate the risk of inaccurate meters
22 remaining in service.

14.1 What costs does FortisBC anticipate it would incur in meeting the conditions specified above.

14.1.1 Please quantify each of the costs specified.

14.2 How would these costs change over time?

15.0 Reference: Exhibit B-6, BCUC 1.8.1

> *The most frequent customer dispute is a high bill. They complain about the meter reading being wrong. In truth there are enough meter reading errors that high bills are a fact of life. But the ability to check the current meter reading directly from the meter while the customer is on the phone and re-calculate the bill if the bill was high, and to end the post call investigation, by being able to directly validate the customer dispute reduces the time to clear a complaint that is nonphone time and it reduces the call handling time of the life of the dispute. It is not unusual that the initial call time goes up, since the CSR has to explain how they are getting the information and may have to have the customer walk to the meter while on the phone and verify the numbers that show on the meter. This has reduced monthly disputes with chronic callers over a period of 3 to 6 months in most utilities that have this ability.*

It is difficult to predict the impact on customer satisfaction of having accurate and frequent meter readings readily available to customers. However to the extent that the availability of such information addresses customer concerns related to high bills and estimated bills, it is probable that customer satisfaction will improve. The use of bill estimates is the unavoidable result of the current manual meter reading process, and drives many of the complaints received. As well, the current high bill process also suffers from a lack of data to assist customers with identifying when their consumption increases and how increases may relate to temperature. This gap is addressed with AMI.

15.1 Does the above information relate only to residential customers?

15.2 Are complaints received from commercial customers relating to high bills also related to the manual meter reading process?

15.2.1 If not, please specify the types of complaints FortisBC receives from commercial customers with respect to high bills.

15.3 Are there other areas in which customer satisfaction is expected to improve other than those related to high bills?

15.4 Has readily available access to accurate and frequent meter readings been found to influence customer electricity usage without time-of-use pricing?

15.5 How many meter reading errors does FortisBC uncover every year? Please specify for commercial and residential customers.

15.6 What is the average amount in dollars of a meter reading error?

15.7 How often does FortisBC attribute temperature fluctuations as a reason for high bill inquiries?

15.8 What other reasons are typically attributed for high bill inquiries?

16.0 Reference: Exhibit B-6, BCUC 1.8.2

FortisBC has rated customer demand for IHD and portal features on a scale of 1 to 10 based on the forecast adoption rates.

IHD/Portal Feature	Forecast Adoption Rate	Demand (1-low, 10-high)
Pre-pay	3-8%	1
In-home display (purchased by customer with PowerSense incentive)	30%	3
Use of customer portal to monitor consumption	15%	2

16.1 Please confirm that the above information relates to residential customers only.

16.2 Does FortisBC have knowledge of the manner in which commercial enterprises in their area do or could utilize higher resolution time-based consumption information to manage their electricity usage?

16.2.1 If so, please provide a description of the manner in which commercial enterprises could utilize the above information.

16.3 Has FortisBC received requests from commercial enterprises for higher resolution time-based information about their electricity usage?

17.0 Reference: Exhibit B-6, BCUC 1.9.1 and Exhibit B-6, BCUC 1.9.1.2 and Exhibit B-6, BCUC 1.9.2

Yes, FortisBC's five wholesale customers are signatories to the British Columbia Climate Action Charter.

Yes, the Company considers the approximately 47,000 customers served by the five wholesale customers to be indirect customers of FortisBC.

Although the Smart Meters and Smart Grid Regulation under the *Clean Energy Act* (CEA) is generally applicable to BC Hydro, section 17 (6) of the CEA also states:

> If a public utility, other than the authority, makes an application under the *Utilities Commission Act* in relation to smart meters, other advanced meters or a smart grid, the commission, in considering the application, must consider the government's goal of having smart meters, other advanced meters and a smart grid in use with respect to customers other than those of the authority.

FortisBC believes it is important for the Commission to consider this alignment, particularly since the CEA, as cited above, requires the Commission, as part of its overall assessment of the proposed Project, to consider the government's goal of having smart meters in use for customers other than those of BC Hydro.

17.1 Does FortisBC believe that the 47,000 customers it considers indirect would also be covered under the government's goal of having smart meters, other advanced meters and a smart grid in use?

18.0 Reference: Exhibit B-6, BCUC 1.10.1

Once AMI meters are installed it would be possible to conduct energy loss measurements on a per-feeder basis. This would be done by subtracting the total energy consumed at customer end-points from the energy supplied to a distribution feeder (as measured by the substation advanced meters). Prior to completion of the DSAP, a large number of distribution feeders would not have had the advanced substation meters necessary to support this calculation.

18.1 Please provide a list of the substation distribution feeders and identify the number of customer endpoints on each.

18.2 Is there a maximum number of customer endpoints that can be accommodated on a distribution feeder?

18.2.1 If so, what is the maximum and what is the criterion by which this maximum is established?

19.0 Reference: Exhibit B-6, BCUC 1.10.2

With respect to the cost reductions associated with reducing system losses, FortisBC is unable to quantify the expected financial benefit at this time. As discussed in the response to BCUC IR1 Q10.1, this is because FortisBC cannot accurately estimate and locate distribution system losses without AMI, and therefore cannot quantify or identify areas of opportunity until AMI is implemented. Further, FortisBC will need to conduct a cost/benefit analysis for any given loss reduction initiatives to ensure that the benefits of the associated loss reduction exceed the cost of any infrastructure upgrades. Hence, these savings have not been reflected in the project costs analysis. Any future financial benefits will be reflected in reduced power purchase costs and potentially reduced growth capital infrastructure investments.

19.1 What types of loss reduction opportunities does FortisBC anticipate being available with AMI that would not otherwise be available?

19.2 What types of infrastructure upgrades would be necessary to address these opportunities?

19.3 Are the infrastructure upgrades anticipated currently installed elsewhere in Canada, the United States or other jurisdictions?

19.4 How long after the implementation of AMI can FortisBC expect to have the necessary information to conduct the above cost/benefit analysis?

19.5 What would be the benefit of 0.5% and 1% reductions in losses across the system respectively?

19.6 Is FortisBC aware of the system losses reduced in other jurisdictions due to the implementation of loss reduction initiatives fostered by AMI implementation?

19.6.1 If so, please provide estimates of the system losses that are being reduced.

20.0 Reference: Exhibit B-6, BCUC 1.10.1 and Exhibit B-6, BCUC 1.10.2 and Exhibit B-6, BCUC 1.78.3

Once AMI meters are installed it would be possible to conduct energy loss measurements on a per-feeder basis. This would be done by subtracting the total energy consumed at customer end-points from the energy supplied to a distribution feeder (as measured by the substation advanced meters). Prior to completion of the DSAP, a large number of distribution feeders would not have had the advanced substation meters necessary to support this calculation.

With respect to the cost reductions associated with reducing system losses, FortisBC is unable to quantify the expected financial benefit at this time. As discussed in the response to BCUC IR1 Q10.1, this is because FortisBC cannot accurately estimate and locate distribution system losses without AMI, and therefore cannot quantify or identify areas of opportunity until AMI is implemented. Further, FortisBC will need to conduct a cost/benefit analysis for any given loss reduction initiatives to ensure that the benefits of the associated loss reduction exceed the cost of any infrastructure upgrades. Hence, these savings have not been reflected in the project costs analysis. Any future financial benefits will be reflected in reduced power purchase costs and potentially reduced growth capital infrastructure investments.

Since customers are on different read cycles and billing meters are read at different times over a multiple-month period, it is not possible to capture a "snap-shot" of the total system consumption. Consequently it is not currently possible to accurately determine system losses for any specific point in time. AMI deployment will enable the accurate and timely collection of more granular information on system losses. Please refer also to the responses to BCUC IR1 Q10.1 and Q78.3.2 with respect to the improved ability to measure and calculate losses.

20.1 What level of granularity does FortisBC believe is necessary to calculate losses on a 'per feeder' basis?

20.2 Why is it necessary for FortisBC to calculate system losses at a specific point in time?

20.3 Please confirm that annual or other long time scale calculations of aggregate losses on the system do not allow FortisBC to determine loss at specific points on the system.

21.0 Reference: Exhibit B-6, BCUC 1.11.1

At present, FortisBC has only installed metering devices at the distribution substation level (i.e. electrically at the point where the distribution feeder leaves the substation). These devices measure and record both the real-time and historical readings of power, energy, current, voltage, and harmonics. Metering at this level is not sufficient to identify or locate sites involving theft of energy. Please see the response to BCUC IR1 Q54.1 describing the downstream distribution metering proposed to be installed.

21.1 Are the current metering devices at the distribution substation level able to identify potential theft of energy within a geographic area?

21.1.1 If so, what is the approximate size of geographic area in which the current metering devices are able to identify areas of potential theft?

22.0 Reference: Exhibit B-6, BCUC 1.11.1 and Exhibit B-6, BCUC 1.54.1

At present, FortisBC has only installed metering devices at the distribution substation level (i.e. electrically at the point where the distribution feeder leaves the substation). These devices measure and record both the real-time and historical readings of power, energy, current, voltage, and harmonics. Metering at this level is not sufficient to identify or locate sites involving theft of energy. Please see the response to BCUC IR1 Q54.1 describing the downstream distribution metering proposed to be installed.

The proposed distribution metering system that enables the detection of electricity theft through energy balancing consists of three types of meters:

- 300 permanent feeder meters at a unit cost of $2,500. This provides for one meter per feeder phase as well as allowances for additional meters on high load feeders. These meters will help analyse specific losses per feeder and enable the identification of feeders with a high risk of energy theft.
- 225 transformer meters at a unit cost of $800. These meters will be deployed to strategic areas of the targeted feeders to narrow the area of focus for the use of the portable meters. They will be redeployed throughout the system depending on which feeders are being analysed.
- 50 portable meters at a unit cost of $1,000. These meters are designed for easy deployment and redeployment along targeted areas of a feeder to identify a selection of premises where energy theft is indicated.

22.1 Will the anticipated theft identification equipment enable FortisBC to identify and locate individual customer sites where energy theft is indicated?

22.1.1 If not, within how many premises/customer sites does FortisBC expect to be able to narrow their identification of potential theft?

22.1.2 What is the approximate size of geographic area that could be identified?

22.1.3 Are the above transformer meters and portable meters capable of working with the existing distribution system? Please explain if they require the proposed AMI project to be undertaken in order to be deployed.

23.0 Reference: Exhibit B-6, BCUC 1.12.3

For the remaining items, FortisBC would like to reiterate that the components listed in the table do not typically represent stand-alone "projects". In many cases they are actually technology sectors or initiatives and would be driven based on the uptake levels of customer-driven projects. For example, Distributed Generation and Electric Vehicle Integration will be driven by customer adoption rates. As well, these components will likely ramp up over a long period of time. Thus, there is no "Year Planned" or "Forecasted Cost" that can be provided for these components. In some cases, there is either no identified need for the project (such as for Demand Response control, Work Management System, or Real-time transmission line rating) or the technology is simply not applicable to FortisBC's operation (Energy Management System).

Key Components	Forecast Cost	Year Planned
Advanced Metering Infrastructure (AMI)	$47.7M	2015
Automated Vehicle Location (AVL) - *	Already deployed	
Computerized Maintenance Management System (CMMS) - *	Already deployed	
Conservation Voltage Reduction (CVR)	~ $9M	Power purchase/cost driven
Customer information portals	Included with AMI	
Cyber-security infrastructure - *	Already deployed	
Dispatch system - *	Already deployed	
Distributed Generation (DG) integration	Customer driven	
Distribution Automation (DA)	Unknown	Ongoing
Demand Response (DR) control	No identified need	
Distribution Management System (DMS)	No identified need	
Electric (EV) or plug-in hybrid (PHEV) vehicle integration	Customer driven	
Energy Management System (EMS)	Not required	
Fibre-optic communications networks - *	Already deployed	
In-Home Displays (IHD)	Included with AMI	
Meter Data Management System (MDMS)	Included with AMI	
Outage Management System (OMS)	~ $1M	~ 2016
Phasor Measurement Units (PMU) - *	Already deployed	
Real-time transformer monitoring - *	Already deployed	
Real-time transmission line rating	No identified need	
Supervisory Control and Data Acquisition (SCADA) - *	Already deployed	
Substation Automation - *	Already deployed	
Wide-area (wireless) communications networks	Included with AMI	
Work Management System	No identified need	
Total Forecast Cost	~ $57 M	

23.1 Please confirm that Electric Vehicle Integration and Distributed Generation integration have not been assessed nor incorporated into the application cost/benefit analysis because FortisBC does not have sufficient information about customer demand for these components.

23.2 Does FortisBC anticipate that these components may be developed over the next 20 years?

23.3 Please confirm that Conservation Voltage Reduction has not been assessed nor incorporated into the application cost/benefit analysis because FortisBC does not have a prediction as to the costs of purchasing power over the next 20 years.

23.4 Would FortisBC accept that BC Hydro's Resource Options Report may be an adequate source of the cost of new energy?

23.5 Please confirm that Demand Response control, Distribution Automation, Distribution Management Systems and Work Management Systems have not been assessed nor incorporated into the application cost/benefit analysis because FortisBC does not anticipate a need for the above.

23.6 Does FortisBC have forecasts as to the expected adoption rate of Electric Vehicles over the next twenty years?

23.6.1 Please provide any forecasts FortisBC has with respect to this adoption.

23.6.2 If FortisBC does not have an estimate would FortisBC accept that BC Hydro's estimates may be a useful proxy?

23.7 Does FortisBC have forecasts as to the anticipated adoption of distributed generation over the next twenty years?

23.7.1 Please provide any such forecasts that FortisBC has available.

23.8 Please clarify what Demand Response control refers to.

24.0 Reference: Exhibit B-6, BCUC 1.14.1 and Exhibit B-1, Application, Page 31

6 Non-financial customer service benefits are detailed in Exhibit B-1, Tab 3.0, Section 3.2.5:
7 Conservation Rate Structures, Enhanced Billing Information, Improved Billing Accuracy,
8 Consolidated Billing for Multiple Customer Locations, Flexible Billing Date and Reduced Need to
9 Access Customer Premises.

21 choices), which could potentially result in a reduced electricity bill. A choice between RIB
22 and a time-based rate may, dependent upon a customer's consumption habits and
23 preferences, allow customers an opportunity to achieve real bill reductions based on
24 whether they are able to reduce overall consumption (under RIB), or simply shift
25 consumption into lower cost periods (under time-based rates).

24.1 Please confirm that Conservation Rate Structures available with AMI can translate into financial benefits for customers.

24.2 What amount of reduction does FortisBC estimate to be a possible 'real bill reduction' for customers who might use the full capability of the HMI system?

25.0 Reference: Exhibit B-6, BCUC 1.14.1 and Exhibit B-1, Application, Page 38 and Exhibit B-1, Application, Appendix E-3 and Exhibit B-6, BCUC 1.25.1

10 Non-financial operational benefits are detailed in Exhibit B-1, Tab 3.0, Section 3.2.5: Enhanced
11 System Modeling, Improved Financial Reporting, Load Forecast and Cost of Service Analyses,
12 Improved Safety, Reduced GHG Emissions, Immediate Notification of Power Outage and
13 Restoration and Improved Power Quality Monitoring.

18 With FortisBC meter reading vehicles driving approximately 500,000 kilometers per year and
19 consuming approximately 80,000 litres of gasoline, GHG emissions (CO_2e) are estimated at
20 191,000 kilograms or 191 tonnes per year. AMI will dramatically reduce this source of
21 emissions as a component of FortisBC's overall GHG emissions.

We are also pleased to learn that this will improve worker health and safety by reducing meter-reading risks and concretely avoid 180 tonnes of GHG emissions, 80,000 litres consumed in 18 meter-reader vehicles.

11 The meter reading vehicles will be permanently eliminated from the vehicle fleet.

25.1 Please confirm that the AMI program will 'concretely avoid 180 tonnes of GHG emissions, 80,000 litres consumed in 18 meter-reader vehicles'. If not, please identify the amount of GHG emissions that will be concretely avoided.

25.2 Please confirm that FortisBC has not calculated the financial benefits of Reduced Greenhouse Gas emissions and that they have not been included anywhere in the financial analysis of the Application.

26.0 Reference: Exhibit B-6, BCUC 1.18.1

12 FortisBC does consider it a requirement of TOU and CPP rates that the AMI meter has hourly
13 interval data availability at minimum.

14 This data can be used to support customer service calls, load research, future time-based rates
15 (such as TOU and CPP), and other applications. Interval data simply represents the most
16 flexible receipt of data, allowing rate calculations to be made and easily changed within the
17 MDMS and billing system. The meter configuration described above (multiple registers) would
18 present FortisBC with challenges and associated costs when it comes time to adapt and
19 reconfigure the meters or system to support new rates and programs. Interval data ensures
20 flexibility for changing business and customer needs and future requirements.

26.1 Is the above response reflective of the ability of the customer to respond to TOU and CPP pricing signals?

26.1.1 If so, does the above response apply to residential customers or commercial customers?

26.2 Would commercial customers making use of TOU and CPP rates likely benefit from shorter than hourly interval data?

26.3 If so, at what level of interval data would commercial customers be most likely to maximize their cost benefits?

27.0 Reference: Exhibit B-6, BCUC 1.20.1

6 For 2011, the total number of billing-related calls was approximately 45,500. Of these calls,
7 approximately 39,500 are estimated to be related to residential inquiries.

27.1 Please confirm that there were 6,000 billing related calls from commercial customers in 2011.

27.2 Please provide the total number of residential and commercial customers and define 'customer' as the customer premise or the meter, whichever is most applicable.

28.0 Reference: Exhibit B-6, BCUC 20.1 and Exhibit B-6, BCUC 20.1.1

6 For 2011, the total number of billing-related calls was approximately 45,500. Of these calls,
7 approximately 39,500 are estimated to be related to residential inquiries.

13 FortisBC does not track calls specifically related to estimate usage. However, calls are tracked
14 for more general categories such as Customer Meter Read, Budget Billing, High Bill Inquiries
15 and Bill Escalations. A proportion of calls within these categories may be attributed to estimated
16 usage. For 2011, the calls within the above noted 4 categories totalled approximately 6,800. Of
17 these, approximately 87% or 5,900 calls are estimated to be related to residential billing.

28.1 Please confirm that there were approximately 38,700 billing-related calls that did not fall into the categories of Customer Meter Read, Budget Billing, High Bill Inquiries and Bill Escalations.

28.2 Please identify the categories of billing-related calls and the numbers of calls within each, for both commercial and residential customers.

29.0 Reference: Exhibit B-6, BCUC 1.21.1

25 FortisBC does not keep records of consolidated bill requests. However, FortisBC does receive
26 requests and can occasionally accommodate them (provided that the meters for each service
27 being consolidated are read on the same meter reading route). FortisBC contact centre
28 personnel estimate that 20-30 customers per month inquire regarding consolidated billing and
29 cannot be accommodated.

29.1 Approximately how often is FortisBC able to accommodate consolidated bill requests in comparison to those it cannot accommodate?

30.0 Reference: Exhibit B-6, BCUC 1.23.1

In other words, future feeder rebalancing work does not represent incremental effort that is required or results from the AMI Project. Instead, AMI meters will offer an additional source of data to be used in future modelling exercises. Until actual data is received from the AMI system, it is unknown to what extent the additional data provided by the system will improve existing system models. Thus, FortisBC is unable to provide an estimate at this time of the incremental improvement that the additional AMI data will provide to these future rebalancing projects.

30.1 Please confirm that FortisBC has not included a financial benefit from future feeder rebalancing based on AMI in the application.

30.2 Does FortisBC have awareness of any incremental improvements experienced by other jurisdictions from the additional information provided by AMI.

31.0 Reference: Exhibit B-6, BCUC 1.27.1

Further, during implementation of the proposed AMI system (and consistent with current meter exchange practices), meter deployment personnel will inspect the meter bases to observe indications of problematic service. Any potential issues discovered will be reported by the AMI system to FortisBC for appropriate action.

31.1 What action does FortisBC currently take when meter bases are observed to have indications of problematic service?

31.2 What costs are borne by the customer when potential issues are discovered based on FortisBC's current practice?

32.0 Reference: Exhibit B-6, BCUC 1.27.1.1

Itron OpenWay meters are capable of reporting temperature conditions from the meter over the network. Itron is currently making necessary enhancements to the HES to receive temperature data from the meter. If overheating is detected, the system will be able to remotely disconnect the meter and service. FortisBC expects this functionality to be enabled (at no additional cost) prior to meter deployment.

32.1 Does the above response imply that overheating is associated with faulty meter bases?

32.2 Is FortisBC aware of whether this enhancement is currently in place and being used in other jurisdictions?

32.3 What temperature conditions would constitute 'overheating'?

32.4 Can or will the system automatically disconnect if overheating is detected?

32.5 Is this functionality guaranteed to be enabled at no additional cost prior to meter deployment?

32.6 Will this functionality add any additional operating or other expenses if utilized?

32.6.1 If so, please clarify any additional costs FortisBC anticipates may be incurred.

32.7 Are there conditions other than overheating that are associated with faulty meter bases and may impact the AMI program? If so, please explain the conditions and their effect.

33.0 Reference: Exhibit B-6, BCUC 1.28.1

18 Preliminary research indicated a price range of $80-$150 per In-Home Display (IHD) device.
19 The approved 2012-13 DSM Plan includes a nominal $50 incentive or up to half the cost, of
20 eligible IHDs. The net Customer Portion of Cost would be $40-$100 of the price range indicated
21 above.

33.1 Does FortisBC consider that a 'nominal $50 incentive or up to half the cost' means the lesser of the two. If so, why?

34.0 Reference: Exhibit B-6, BCUC 1.28.1.1

30 The customer's payback on their net IHD cost of $100 (after $50 DSM incentive) is
31 approximately 1.5 years, assuming the average usage per customer (UPC).

34.1 Has FortisBC considered making IHD devices available on a rental basis at a considerably lower cost to individual customers? If not, why not?

34.2 What is the average usage per customer (UPC)?

35.0 Reference: Exhibit B-6, BCUC 1.28.1.2

3 The IHD devices will be piloted in 2014, with availability to customers expected in 2015.

35.1 Would FortisBC be able to make IHD devices available to customers earlier than 2015 if they instituted a rental program?

36.0 Reference: Exhibit B-6, BCUC 1.30.1

30 FortisBC is proposing that the advanced meters include HAN functionality at implementation.
31 This functionality is important in order to give customers near real-time access to consumption
32 information through in-home displays and simplifies the implementation of conservation rates
33 such as CPP and pre-pay. Please see the Application (Exhibit B-1) at Tab 4.0, Section 4.1.1.

36.1 Would FortisBC agree that delay in the provision of technological advancements to customers enabling near real-time access to consumption information would contribute to further delay in customer understanding and uptake of the technology and still further delay in customer adoption of conservation practices?

37.0 Reference: Exhibit B-6, BCUC 1.30.2.1

19 Zigbee has a dominant market share in North America, and is currently the only standards-
20 based protocol (Smart Energy Profile) offered by the major AMI vendors. None of the
21 alternative protocols listed in this question are available in Measurement Canada-certified
22 meters. As well, the Zigbee protocol was chosen by BC Hydro and FortisBC believes it is in the
23 provincial interest that home automation devices capable of connecting to electric meters in BC
24 use the same protocol.

37.1 Why does FortisBC believe that it is in the provincial interest that home automation devices capable of connecting to electric meters in BC use the same protocol?

38.0 Reference: Exhibit B-6, BCUC 1.30.3

15 FortisBC has not forecast customer penetration of in-home displays beyond 30 percent (not a
16 majority of customers), and has not forecast the use of other HAN devices. 30 percent
17 penetration of IHDs is expected to occur between 2015 and 2020 (assuming BCUC approval of
18 the AMI Project is received by July 20, 2013).

38.1 Does FortisBC consider cost to be a factor in customer implementation of IHD?

38.2 If so, does FortisBC believe that substantially reduced customer costs associated with IHD's could stimulate customer penetration beyond 30%?

39.0 Reference: Exhibit B-6, BCUC 1.32.2

5 collectors would require satellite backhaul. It should be noted that third party cellular providers
6 have planned coverage enhancements in 2012 and 2013 that would provide backhaul for 15 of
7 these 35 collector locations servicing approximately 3,520 meters. If all of the planned
8 coverage enhancements are completed prior to the AMI rollout, satellite backhaul will be
9 required for only 20 collectors servicing approximately 2,830 customer meters.

39.1 Does FortisBC believe that planned cellular coverage enhancements will be made beyond 2013 that could provide backhaul coverage for the remaining 20 collectors?

40.0 Reference: Exhibit B-6, BCUC 32.2.4

9 FortisBC has not identified any technical or operational barriers or showstoppers that would
10 preclude an installation using either PLC or AMR technology, and will continue to look at
11 alternative LAN options such as these. However the cost of satellite backhaul bandwidth that
12 would be avoided is not sufficiently high to make either option more economical than the
13 proposed RF mesh system in locations with sufficient population. As discussed in section 4.1.3
14 of the Application, FortisBC is continuing to evaluate WAN options as technology changes, and
15 both options have been and will continue to be considered in these areas.

40.1 Does FortisBC believe that costs of the proposed RF mesh system will decline over time relative to PLC or AMR technology?

40.2 If so, does FortisBC anticipate that the sufficient population required to make the proposed RF mesh system economical will decline?

40.3 What does FortisBC anticipate in population growth for the next 5, 10, 15 and 20 years in areas in which the satellite backhaul technology will be used?

40.4 What is the minimum population size required to make the RF mesh economic?

41.0 Reference: Exhibit B-6, BCUC 1.33.1b

Table BCUC IR1 Q33.1b

	Status Quo			Post - AMI			Post - AMI		
	Cost ($000)	100% manual reads	Cost per Customer	Cost ($000)	1% manual reads	Cost per Customer	Cost ($000)	5% manual reads	Cost per Customer
2008	$2,145	109719	$19.55						
2009	$2,107	110853	$19.01						
2010	$2,232	112249	$19.89						
2011	$2,430	111407	$21.81						
2012	$2,474	114232	$21.66						
2013	$2,518	116484	$21.62						
2014	$2,684	118809	$22.59						
2015	$2,733	121135	$22.56						
2016	$2,782	123371	$22.55	$238	1234	$192.69	$792	6169	$128.46
2017	$2,959	125581	$23.56	$246	1256	$196.11	$821	6279	$130.74
2018	$3,012	127798	$23.57	$255	1278	$199.60	$850	6390	$133.06
2019	$3,067	130024	$23.58	$264	1300	$203.03	$880	6501	$135.36
2020	$3,256	132188	$24.63	$273	1322	$206.64	$911	6609	$137.76
2021	$3,315	134357	$24.67	$283	1344	$210.29	$942	6718	$140.20
2022	$3,374	136518	$24.72	$292	1365	$213.98	$974	6826	$142.65
2023	$3,576	138650	$25.79	$302	1387	$217.83	$1,007	6933	$145.22
2024	$3,641	140812	$25.86	$312	1408	$221.67	$1,040	7041	$147.78
2025	$3,706	142955	$25.93	$322	1430	$225.57	$1,075	7148	$150.38
2026	$3,922	145078	$27.04	$333	1451	$229.55	$1,110	7254	$153.04
2027	$3,993	147181	$27.13	$344	1472	$233.63	$1,146	7359	$155.75
2028	$4,065	149280	$27.23	$355	1493	$237.77	$1,183	7464	$158.51
2029	$4,296	151367	$28.38	$366	1514	$241.95	$1,221	7568	$161.30
2030	$4,373	153420	$28.50	$382	1534	$249.10	$1,274	7671	$166.07
2031	$4,452	155448	$28.64	$394	1554	$253.51	$1,314	7772	$169.01
2032	$4,698	157481	$29.83	$406	1575	$257.97	$1,354	7874	$171.98

Annual cost per customer for manual meter reading prior to AMI implementation is approximately $23.

Post-AMI, manual meter reads for 1% of customers will be approximately $193 per customer per year. The growth in cost per customer is directly related to the fact that average travel time between reads will increase substantially from the current state.

For a more direct comparison to the BC Hydro numbers cited in the preamble, FortisBC has also included the estimated manual meter reads costs for 5% of customers. FortisBC expects the cost to be approximately 5.7 times higher compared to pre-AMI costs. This ratio may be higher than BC Hydro's due to lower customer density in the FortisBC service territory.

41.1 Please provide the calculations FortisBC used to estimate the cost of meter reading at both the 1% and 5% levels.

41.1.1 Please provide a complete breakdown of the types of costs included with a description of each and the assumptions used to derive this data.

41.2 Would FortisBC agree that the per customer cost of meter reading can be expected to decline in a non-linear manner from 0% to 1% to 5% and more, with the number of customers receiving manual meter reading?

41.3 Please provide the scale/curve that FortisBC estimates meter reading costs would decline per percent of customers receiving manual meter reading.

41.4 Please identify any assumptions that FortisBC may employ in making the above estimations.

42.0 Reference: Exhibit B-6, BCUC 1.35.3

5 Role-based security will be used which will ensure only authenticated users have access to the
6 system. Additionally, users will be assigned to roles or security groups that will limit the
7 functions they can perform or data they are authorized to view.

42.1 Does FortisBC currently have established security levels limiting the authorization to view data? If so, please identify the levels of authority, functions and the types of data authorized for viewing at each level.

42.1.1 If in place, does FortisBC intend to utilize the same security levels?

42.1.2 If not, what security group levels does FortisBC intend to implement?

42.1.3 What, if any, background checks does FortisBC expect to employ for the various authorized users?

43.0 Reference: Exhibit B-6, BCUC 1.36.1.2

13 FortisBC has embedded in its contract with Itron that Itron shall submit all proposed forms of
14 procurement documents, including forms of subcontract, to FortisBC for review. Itron is
15 required to ensure that all competitive procurement process(es) give preference to unionized
16 contractors whose unions are recognized by the British Columbia Federation of Labour and
17 provide meaningful First Nations employment opportunities in connection with work to be
18 performed on First Nations territories. FortisBC has oversight on Itron's final selection of a
19 deployment subcontractor. As such, the risk of discrimination is minimized or avoided.

43.1 Are there additional requirements other than those identified above that FortisBC has embedded into its contract with Itron regarding selection of the deployment subcontractor?

43.2 Does review of the proposed forms of procurement documents mean approval of those documents prior to implementation?

43.3 Does 'oversight on Itron's final selection' mean that FortisBC has final approval?

43.3.1 If not, please clarify what oversight would entail.

44.0 Reference: Exhibit B-6, BCUC 1.38.3

8 1. AMI communications technologies are continuously evolving, so it was prudent to test
9 the market with business requirements, not technology requirements; and

10 2. FortisBC AMI requirements are unique to its operating environment.

44.1 Does FortisBC agree that communications technologies will continue to evolve and that testing these technologies against business needs is the best method of determining what technologies should be employed and when they should be implemented?

44.2 What FortisBC AMI requirements are unique to its operating environment?

45.0 Reference: Exhibit B-6, BCUC 1.39.1 and BCUC 1.39.2

25 Itron has no incentive to re-use removed electromechanical meters as they are considered
26 obsolete and will be salvaged for scrap value. Itron is required to apply any potential value from
27 the digital meters against the cost of recycling/disposing of the meters.

1 The cost of meter disposal is included in the meter deployment cost estimate, and is assumed
2 to be offset entirely by the scrap value of the meter.

45.1 Please confirm that all the electromechanical meters will be salvaged for scrap value and that recycling will not be considered for any of these meters?

45.2 Does FortisBC believe that the digital meters could be resold or refurbished and resold?

45.2.1 If so, what is the current market rate for used digital meters?

45.3 Is FortisBC required to apply any potential scrap value from the electromechanical meters against the cost of disposal?

45.4 Does FortisBC believe it is possible that the total scrap value of the meters could exceed the cost of disposal?

45.5 What incentive does Itron have to maximize the scrap value of the electromechanical meters or any residual value from the digital meters; or otherwise minimize the cost of disposal and maximize any salvage value from either the electromechanical or digital meters? Please explain.

45.5.1 Would FortisBC agree that maximizing the value of either the electromechanical meters or the digital meters would necessitate extra work on the part of Itron or a subcontractor?

45.6 Does FortisBC have an estimate of the scrap value of the electromechanical meters and the potential value from the digital meters? If so, please provide the estimates.

45.7 Would FortisBC agree that any increase in the value received from either the electromechanical or digital meters would benefit FortisBC but not Itron? If not, why not?

45.8 Does FortisBC have any input into the salvage methods undertaken by Itron?

46.0 Reference: Exhibit B-6, BCUC 1.42.1

As the costs are "sustaining" in nature and will continue after the project is complete, FortisBC chose to keep these expenditures separate from the proposed AMI project capital costs on Line 27. The sustaining capital expenditures are still included in the overall AMI project financial analysis, so the overall NPV and rate impacts would not be affected if the sustaining capital expenditures were instead added to project capital expenditures.

46.1 Please confirm that FortisBC has sustaining capital and non-capital costs for its current metering processes.

46.2 Please confirm that capital and non-capital 'sustaining' costs including those associated with meter growth and replacement, IT hardware, licensing and support costs can be expected to continue for as long as any type of meter is in place, including after the 20 year project analysis time frame.

46.3 Please confirm that FortisBC will continue accounting for the capital and non-capital sustaining costs after the 20 year analysis time frame is over.

47.0 Reference: Exhibit B-6, BCUC 1.42.2

The larger Equipment/Hardware/Servers expenditures in 2017, 2022 and 2027 relate to adding additional capacity to the storage area network (SAN). The smaller annual expenditures in this category are for ongoing replacement of field communications and network devices.

47.1 Will the additional capacity added to the SAN be available for use beyond 20 year planning horizon?

48.0 Reference: Exhibit B-6, BCUC 1.42.2.1

Based on the above, FortisBC has applied 50 percent of the forecast IT Support Costs that are referenced in Exhibit B-3 as Capital Costs, and 50 percent as Operating Expenses (as part of New Operating Costs as referenced in Exhibit B-3).

48.1 Why has FortisBC selected 50/50 as the split between Capital and Operating?

49.0 Reference: Exhibit B-6, BCUC 1.43.1

Delays in operational benefits related to meter reading, remote disconnect/reconnect, contac centre, and theft reduction were included in the analysis.

The Company did not include meter exchanges or avoided cost benefits associated wit Measurement Canada compliance, since those benefits are realized by the installation of th AMI meters.

See the table below for the financial impact of a six month delay in the realization of the state operational benefits:

	NPV ($000s)	
	AMI proposal (errata 1)	6 month delay in operational benefits
Meter Reading	-$23,785	-$22,383
Remote Disconnect/Reconnect	-$5,466	-$5,158
Contact Centre	-$441	-$410
Theft Reduction	-$38,386	-$37,491
Project NPV	-$17,629	-$14,992

49.1 Please confirm that a six month delay in operational benefits would result in a net loss to FortisBC of $2,637,000 (PV). If so, what is the rate impact of such a delay?

49.2 Does the cost of delay in the operational benefits increase in a linear manner on a monthly basis for each? Please explain why or why not?

49.2.1 If not linear, please provide the expected curve by which costs would accrue over time including a three month, nine month and one year delay.

49.3 Does FortisBC predict that a BC Human Rights tribunal ruling relating to the BC Hydro SMI program in favour of the Citizens for Safe Technology could result in a delay or otherwise necessitate a change in FortisBC's AMI implementation? Please provide a rationale.

49.3.1 If so, has FortisBC developed possible means of addressing such changes?

49.3.2 If the BC Human Rights Tribunal hearing has not provided a ruling prior to the August 2013 deadline to proceed with the Itron contract, will FortisBC proceed with the Itron contract?

50.0 Reference: Exhibit B-6, BCUC 1.46.3 and Exhibit B-1, Application, Page 143

FortisBC believes that the "Project Challenges" identified in Exhibit B-1, Tab 8.0, Section 8.4 could be considered emerging risks in that they are potentially significant but not fully understood since they are not necessarily based on actual risks. The nature of these challenges makes the development of risk response strategies difficult.

- Advanced metering benefits can be eroded by "opt-out" customers.

50.1 Please clarify what FortisBC means by 'opting out' and the technology, information characteristics or other elements that would characterize an opt-out.

50.2 If 'Opt Out' has a potentially multi-dimensional definition how many variations would FortisBC expect may be possible and what does FortisBC believe would be the implications of trying to manage this?

50.3 If 'Opt Out' is dependent upon customer approval does this mean that FortisBC would forever have meter implementation as an individual customer choice?

50.3.1 If so, what would be the implications of 'opt out' customers moving to sites in which AMI was already installed, or moving away from sites where they had 'opted out'?

50.4 To what extent does FortisBC believe that customers are likely to request to 'opt-out'?

50.5 Please identify all the ways in which advanced metering benefits can be eroded by opt-out customers.

50.6 Does FortisBC have an estimate of the cost per customer that would be incurred if customers were permitted to 'opt –out' as defined by FortisBC other than the meter reading cost of 'opt out'? If so, please provide the cost estimates and how they were derived.

50.6.1 Please identify if these costs would be incurred in a straight line with respect to the numbers of people opting out. Please provide the relationship or curve under which opting out would generate costs for FortisBC.

50.7 If a customer were permitted to 'opt-out' for reasons related specifically to the exposure to RF signals, what changes would FortisBC need to be undertake to enable the customer access to electricity without exposure to RF signals?

50.7.1 What would be the cost of these changes?

50.7.2 Would the ratepayers be responsible for these costs and if so, why?

50.7.3 Does FortisBC believe that eliminating the RF signal from a Smart Meter would enable a person to eliminate RF signals from their personal environment? Please explain.

50.7.4 To what extent would this reduction likely limit an individual's exposure to RF signals throughout a year? Please quantify.

51.0 Reference: Exhibit B-1, Application, Page 45 and Exhibit B-6, BCUC 1.46.4

5 manage their electricity usage. Products are in development that will enable customers,
6 should they wish to do so, to optionally connect appliances such as washers, dryers,
7 furnaces and air conditioners and with technology emerging today in home automation,
8 control these devices from their home network. For clarity, the visibility, automation and
9 control of these devices will reside solely in the hands of the customer, and not with the
10 utility.

28 FortisBC believes there is only a minor risk associated with the home automation
29 communication protocol choice made by home appliance manufacturers since economic
30 solutions are likely to be available. Please also see the response to BCUC IR1 Q30.2.1.

51.1 Please identify the types of home automation devices that are currently available, that can be installed at the customer's discretion, and are facilitated by the Zigbee or other wireless communication protocols?

51.2 Is FortisBC aware of other types of home automation devices under development in addition to those identified above? If so, please provide a list of such products.

51.3 Does FortisBC believe that the development and adoption of home automation devices will be increasing over the next twenty years and beyond the 20 year analysis period?

51.4 Please confirm that AMI is a key facilitating technology of "Smart Home" applications.

52.0 Reference: Exhibit B-6, BCUC 1.27.1 and Exhibit B-6, BCUC 1.47.1.1

9 Further, during implementation of the proposed AMI system (and consistent with current meter
10 exchange practices), meter deployment personnel will inspect the meter bases to observe
11 indications of problematic service. Any potential issues discovered will be reported by the AMI
12 system to FortisBC for appropriate action.

7 The meter deployment training document will be reviewed once it is created during the define
8 and design stage of the project by:

9 • Supervisor, Meter Reading

10 • Director, Network Services

11 • Manager, Technical Trades

12 The following topics will be outlined in the deployment training manual:
13 Pre-Installation Site Inspection
14 1.0 Assess acceptability of site for installation by looking for:
15 1.1 Generally unsafe meter conditions,
16 1.1.1 Water visibly present near meter socket or,
17 1.1.2 Exposed wiring
18 1.2 Evidence of tampering,
19 1.2.1 Missing meters,
20 1.2.2 Incorrect meter in socket,
21 1.2.3 Upside down meter (in conjunction with broken seal)
22 1.2.4 Drilled holes in meter glass
23 1.3 Compromised insulation
24 1.3.1 Burn marks in and around the meter,
25 1.3.2 Discoloured metal,
26 1.3.3 High temperature socket

52.1 When does FortisBC require the meter deployment training document to be completed?

52.2 Please confirm that FortisBC currently follows the same procedures when exchanging meters as it or the subcontractor will under the AMI exchange.

52.2.1 If not confirmed, what differences does FortisBC expect from its existing methods?

52.2.2 If not confirmed, does FortisBC consider that the proposed exchange procedures will be an improvement over the existing exchange procedures? Please explain.

52.2.3 If an improvement, would FortisBC consider this to be a customer benefit of the AMI program?

52.3 At what average interval would FortisBC expect that an individual customer's meter would be exchanged/replaced for any reason and so result in an inspection of the meter base?

52.4 What would be the maximum length of time an individual's meter base would reside without inspection under the status quo?

53.0 Reference: Exhibit B-6, BCUC 1.47. 1

- Jumpers/unusual Wiring;
- Broken or missing Government seal;
- Unusual lug wear combined with broken or missing seal;
  - Broken or cracked meter base lugs;
- Neutral wire is properly connected in meter base (note: this applies to network and poly phase metering only);
- Verify meter compatibility with socket (voltage/current/number of elements);
- Voltage check on all meter bases looking for;
  - Continuity (or load side resistance);and
  - Standard FBC residential voltage.

53.1 Do FortisBC meter readers currently examine meter bases for the above conditions at the time of meter reading?

53.2 If so, does FortisBC believe that the tamper, failure or any other automated detection capabilities of the AMI system can more accurately identify damage to meter bases than would occur during manual meter readings?

53.3 Under what conditions would an existing socket not be compatible with the new meter?

53.3.1 Is there a particular type of meter base in FortisBC territory that has incompatible sockets? Please explain.

53.3.2 If so, can FortisBC identify where these meter bases are located prior to installing the new meters?

53.4 How often does FortisBC expect to find incompatible sockets?

54.0 Reference: Exhibit B-6, BCUC 1.47.3

If any deficiencies are found, the deployment procedures will specify what measures must be taken to correct these deficiencies prior to installation completion. These measures may include the replacement of a faulty meter base by a qualified electrician at no cost to the customer.

54.1 Does FortisBC currently replace faulty meter bases at no cost to the customer?

54.2 Are there conditions under which FortisBC would expect to charge the customer if a faulty meter base is identified?

55.0 Reference: Exhibit B-6, BCUC 1.47.3

FortisBC performed 54,640 meter installations, removals or replacements in the period from 2006 through 2011. During this period there were 13 reported meter incidents where some form of meter base damage occurred or was identified. Further, FortisBC has checked its records and has found no evidence of any damage to customer property (other than the meter base) that has occurred as a result of a meter installation, removal or replacement.

55.1 Does '2006 through 2011' include all of 2006 and all of 2011 for a total of 6 years?

55.2 Please provide the number of incidents year by year.

55.3 Please clarify whether the 13 reported meter incidents of 54,640 meter installations, removals or replacements were all as a direct result of the meter installation/exchange activity, or if these 13 incidents included pre-existing damage to meter bases.

55.3.1 If the 13 reports were restricted to damage that occurred at the time, please identify how many meter bases FortisBC finds already damaged in its routine observations.

55.3.2 If the 13 reported meter incidents includes meter base damage that was pre-existing at the time of the incident, does FortisBC believe that there are currently damaged meter bases which are currently undetected in its service area?

55.3.3 Would FortisBC expect to detect these in the meter exchange as part of AMI?

56.0 Reference: Exhibit B-6, BCUC 1.47.3

FortisBC has conservatively budgeted for over 1,000 meter base replacements as part of the AMI project budget to help ensure that any identified issues with customers' meter bases can be repaired with minimal customer inconvenience.

56.1 Please confirm that if FortisBC's prior experience is an appropriate basis for estimating one would expect about 30 meter base replacements.

56.1.1 If FortisBC's experience is not an appropriate basis for estimating please explain why.

56.2 Does budgeting for 1,000 meter base replacements enable FortisBC to do a better job of defective base replacement than it currently does?

56.3 If so, would FortisBC consider advanced defective meter base replacement to be a benefit to the customer?

57.0 Reference: Exhibit B-6, BCUC 1.47.4.1

26 The meter vendor has provided information that the product is designed to accept twice the
27 normal line voltage indefinitely (i.e. 480 volts for the single-phase meter); this ensures that the
28 device is unaffected by most overvoltage events. A metal-oxide varistor (MOV) surge protector
29 is used to protect the meter hardware (power supply and voltage sensing inputs) from transient
30 over-voltage surges. In the event of a long-duration, extreme over-voltage situation, a current-

57.1 How does the ability of the AMI meters to withstand surcharge compare to those currently in place?

58.0 Reference: Exhibit B-6, BCUC 1.50.1.1

8 2012 AMI Application costs incurred to date are $2,365,000, or 860 percent, higher than the
9 2007 AMI Application costs.

10 Commission Order G-168-08, denying a CPCN for the 2007 AMI Application, stated, among
11 other things, that "the Commission Panel considers that the risk of exposure to unknown costs
12 of future elements of the program outweighs the value of any savings associated with the
13 current AMI Project application" (page 22).

1 In order to address this concern FortisBC consulted experts (such as Util-Assist, Navigant, and
2 Exponent), and employed two RFP processes to identify the AMI solution presented in this 2012
3 AMI CPCN Application. Ultimately, FortisBC selected Itron Canada as the vendor for the major
4 components of the AMI Project, and negotiated a firm contract for a substantial portion of project
5 costs. Finally, FortisBC ensured that a comprehensive consultation process was followed in
6 order to ensure that the Company understood its Stakeholders views on AMI.

58.1 Please explain specifically how the 'risk of exposure to unknown costs' as stated by the Commission has been or will be mitigated by the above $2,365,000 consultation process.

58.2 Please identify which potential costs have been reduced or made more firm because of this process.

59.0 Reference: Exhibit B-6, BCUC 1.52.3

10 The 20 year study period was chosen in order to reflect the 20 year economic life of the meters
11 (which are the most significant project expense).

59.1 Would FortisBC agree that the AMI meters could well last beyond the 20 year economic life established?

59.2 Would FortisBC agree that if a new and superior technology were made available within the 20 year period, FortisBC would consider adopting that technology if it could be done so with a positive and significant Net Present Value?

59.3 Would FortisBC agree that future replacements of the digital meters installed in its AMI project will include all the functionality of the currently selected Itron meters and would very likely include significantly enhanced functionality?

59.4 Would FortisBC agree that the transition to digital metering being made possible by the AMI project will not terminate at the end of 20 years and that the benefits of digital metering will continue into the future? If not, please explain.

59.5 Would FortisBC agree that the transition to increased resolution of information made possible by the AMI project will not terminate at the end of 20 years, and that the benefits of the increased granularity will continue into the future? If not, please explain.

59.6 Would FortisBC agree that the transition to automated meter reading will not terminate at the end of 20 years and the benefits will continue into the future? If not, please explain.

59.7 Would FortisBC agree that the ability to remotely disconnect and reconnect can be expected to continue beyond the 20 years? If not, please explain.

59.8 Would FortisBC agree that the technology associated with identifying, deterring and catching energy theft will not terminate at the end of 20 years and the benefits will continue into the future? If not, please explain.

60.0 Reference: Exhibit B-6, BCUC 1.53.2.2

27 The 2008 Application assumed a useful life of the meters to be 25 years. As noted in Exhibit B-
28 1, Tab 5.0, Section 5.3.3, p. 76 of the current Application, the Company has revised its estimate
29 of the economic life to 20 years, partly based on information from the meter manufacturer that
30 was not available in the 2008 Application, hence the decrease in the time-period.

60.1 What information became available from the meter manufacturer that was not available in the 2008 Application that resulted in the decreased time period?

61.0 Reference: Exhibit B-6, BCUC 1.53.1.1

8 No. The Application provides the costs and benefits associated with the AMI Application;
9 however a change in the assumptions included in the Application could improve the benefits
10 associated with the Project.

61.1 Please specify what changes in the assumptions could be reasonably foreseen as likely to occur and how they might improve the benefits associated with the Project?

61.1.1 Please quantify the potential improvements where possible.

62.0 Reference: Exhibit B-6, BCUC 1.43.1 and Exhibit B-6, BCUC 1.53.11

In this response, FortisBC assumes that the proposed AMI project is implemented as per the preliminary project plan, but operational benefits are delayed by six months.

Delays in operational benefits related to meter reading, remote disconnect/reconnect, contact centre, and theft reduction were included in the analysis.

The Company did not include meter exchanges or avoided cost benefits associated with Measurement Canada compliance, since those benefits are realized by the installation of the AMI meters.

See the table below for the financial impact of a six month delay in the realization of the stated operational benefits:

	NPV ($000s)	
	AMI proposal (errata 1)	6 month delay in operational benefits
Meter Reading	-$23,785	-$22,383
Remote Disconnect/Reconnect	-$5,466	-$5,158
Contact Centre	-$441	-$410
Theft Reduction	-$38,386	-$37,491
Project NPV	-$17,629	-$14,992

Table BCUC IR1 Q53.11 – Cost Sensitivity Analysis of Project Implementation Delay

Net AMI	Errata 1	6 month delay	1 year delay	2 year delay
Project Start Date	3Q2013	2Q2014	3Q2014	3Q2015
Activity	($000s)			
AMI Project Development and Regulatory Costs	2013 - 2032	2013 - 2033	2013 - 2033	2013 - 2034
Total	$4,915	$4,915	$4,915	$4,915
CAPEX				
Total Capital Expenditure	$42,773	$45,126	$45,126	$45,938
Sustaining Capital				
Meter Growth and Replacement	$4,286	$4,880	$4,880	$5,652
Handheld Replacement	-$1,149	-$1,149	-$899	-$1,257
IT Hardware, Licensing, and Support Costs	$12,767	$12,882	$12,997	$13,227
Measurement Canada Compliance	-$18,555	-$17,864	-$17,864	-$17,493
Total Sustaining Capital	-$2,651	-$1,251	-$886	$129
Operating Expenses				
New Operating Costs	$32,196	$32,486	$32,776	$33,355
Meter Reading	-$58,116	-$60,620	-$59,574	-$61,976
Disconnect/Reconnect	-$13,267	-$14,245	-$14,245	-$14,953
Meter Exchanges	-$1,802	-$1,087	-$1,087	-$883
Contact Centre	-$1,157	-$1,212	-$1,212	-$1,254
Total Operating Expenses	-$42,146	-$44,678	-$43,342	-$45,711
Theft Reduction	-$93,705	-$99,376	-$97,867	-$101,519
Total	-$90,814	-$95,264	-$92,054	-$96,248
Project NPV	-$17,629	-$16,316	-$13,162	-$11,979

62.1 Please confirm that the NPV discounting has used the rate of 8%.

62.2 Please identify whether inflation has been captured in the 6 month or the 1 year calculations.

62.3 Please confirm that the above calculations capture both anticipated growth and inflation.

63.0 Reference: Exhibit B-6, BCUC 1.53.14.2

11 No. Consistent with all capital projects undertaken by the Company, the benefits would be
12 incorporated into Revenue Requirements either as cost reductions or incremental revenue as
13 they are forecast to be realized. Attempting to accumulate the benefits in a "holding" deferral
14 account would be inconsistent with the treatment of other capital, would provide no incremental
15 benefit to customers and would add additional administrative burden to the utility. The Company
16 has forecast loss reductions of 2 GWh associated with theft reduction due to AMI in its 2012 –
17 2013 Revenue Requirements Application.

63.1 How does FortisBC intend to match benefits to on-going costs and smooth them for rate payers at present and in the future?

64.0 Reference: Exhibit B-1, Application, Appendix C-4, Page 22 of 44 and B-6, BCUC 1.53.15

5 "Theft Detection - These costs are for additional metering required to detect losses on
6 the distribution system." [Ref: B-1, p. 71]

7 Theft Analytics—A suite of software tools that support enhanced electricity network
8 modeling methods, as well as the business rules required to analyze measurement data
9 captured from new distribution system meters and the end-user advanced meters. [Ref:
10 B-1, App. C-4, p. 22 of 44]

22 Theft reduction benefits are a combination of power purchase reductions and revenue
23 increases, and so have been separated from capital and operating expenses.

64.1 Please identify whether the theft values are just for direct energy loss or use as opposed to being inclusive of system losses and reserve capacity requirements.

65.0 Reference: Exhibit B-6, BCUC 1.56.3 and Exhibit B-6, BCUC 1.56.5

Table BCUC IR1 Q56.3 – Financial Benefit Realization

Benefit Description	Monitoring Plan
Meter reading cost	Compare actual meter reading expenses to the forecast on Line 47 of the *Gross AMI* worksheet filed as part of Exhibit B-3
Theft reduction	Compare actual number of theft sites identified to the number of theft sites forecast on Row 26 of the *Theft Reduction* worksheet filed as part of Exhibit B-3 Compare actual revenue recovered from theft sites to the revenue forecast on Row 29 of the *Theft Reduction* worksheet filed as part of Exhibit B-3
Remote disconnect/reconnect	Compare cost of manual disconnects and reconnects to the forecast on Line 48 of the *Gross AMI* worksheet filed as part of Exhibit B-3
Measurement Canada compliance	Monitor whether 100% of electromechanical and small-batch digital meters are replaced with AMI meters.
Meter exchanges	Compare actual Measurement Canada-related compliance meter exchange expenses to the forecast on Line 49 of the *Gross AMI* worksheet filed as part of Exhibit B-3
Contact centre	Monitor whether the Contact Centre needs to manually enter any soft reads into the billing system once the AMI project is complete.

FortisBC proposes to report on the above items annually to the BCUC for a period of five years once the AMI project is complete.

FortisBC plans to continuously review and monitor the AMI project and manage risks as they are identified. Please also see Exhibit B-1, Tab 4.0, Section 4.3.5, pp. 66-67 and the responses to BCUC IR1 Q46.1 - Q46.3.1.

FortisBC notes that the Project as proposed in the Application is viable. As a prudent utility operator, FortisBC will ensure project risks are managed as is done for all capital projects undertaken for the benefit of customers, however no ongoing monitoring of project viability is planned.

65.1 Please identify at what stage FortisBC will consider the AMI project to be complete and will report on the above items to the BCUC for a period of 5 years.

65.2 Will FortisBC report on the above items prior to project completion?

66.0 Reference: Exhibit B-6, BCUC 1.57.1 and BCUC 1.58.12.2

All meter reading expenses are inflated at 1.8 percent per year. However, in order to maintain the average annual reads per meter reader at approximately 36,000 reads per year, the

Company has forecast (in the Status Quo scenario) that an additional meter reader will be required in each of 2014, 2017, 2020, 2023, 2026, 2029, and 2032. Each of these additional meter readers are accompanied by an associated increase in non-labour support, vehicle and handheld support. As a result, savings attributed to the Company's proposed AMI Project grow disproportionally (more than the 1.8 percent inflation rate) in those years as noted in the question.

The Company assumed that labour escalation costs would not exceed general inflation over the study period and that customer growth would remain at a historical average of below two percent.

66.1 What is the average and maximum number of meter reads accomplished in a day by one meter reader? If necessary, please break down by geographic area.

66.2 Please explain why FortisBC requires an additional meter reader every three years in order to maintain the average annual meter reads per meter reader.

66.3 If the need for additional meter readers is entirely due to anticipated population/customer growth, does FortisBC believe that the population in its service area is expected to continue to grow by approximately 36,000 meter reads every three years?

66.3.1 Please identify the population forecast that FortisBC has utilized.

66.4 Please identify the number of meter reads per month per customer FortisBC uses for its average estimate of 36,000 meter reads per year per meter reader.

66.5 Does the number of meter reads that can be read by a meter reader vary depending on the geographic dispersion of the meters being read? Please explain the variations and how they affect the number of meter reads possible.

66.5.1 If so, does FortisBC anticipate that population growth in its service area will be geographically consistent with the existing population?

66.5.2 Does FortisBC anticipate any population migration either to or from urban centres based on retirement or other factors? If so, please explain.

67.0 Reference: Exhibit B-6, BCUC 58.2

7 The Company considers 1.8% to be a conservative scenario, and notes that if in the overall
8 NPV analysis the inflation assumption was changed to 3.0% (for all costs in both the AMI and
9 Status Quo cases), the NPV benefit of the AMI project would increase to $26.688 million.

67.1 Does FortisBC consider 3.0% inflation to be a more likely scenario than 1.8%?

67.2 What rate does FortisBC consider to be the most likely scenario as opposed to a conservative scenario and why?

67.2.1 What would be the anticipated NPV benefit at the most likely rate?

68.0 Reference: Exhibit B-6, BCUC 59.2

13 The interest rate applied to the non-rate base deferral account is forecast to be approximately
14 six percent.

68.1 Please provide the rationale for the six percent interest rate forecast to be applied to the non-rate base deferral account.

68.2 What is the non-rate base deferral account amortization period?

68.3 Please provide the period of time over which interest is expected to be applied to the non-rate base deferral account.

69.0 Reference: Exhibit B-6, BCUC 60.2

30 Based on the experience of FortisBC's industry consultant, it is expected that 2 business
31 analysts would be required to manage the events for a utility of FortisBC's size.

69.1 Please confirm that the industry consultant to whom FortisBC is referring is Util-Assist.

70.0 Reference: Exhibit B-1-1, Errata Updated, Page 70, Table 5.1-B and B-6, BCUC 1.66.1, Table 5.1-B

Table 5.1.b – Summary of All Incremental Non-Project Costs and Benefits

AMI	2013	2014	2015	2016	2017 – 2032	Total
Sustaining Capital						
Meter Growth and Replacement	-	99	100	85	4,001	4,286
Handheld Replacement	-	(250)	-	-	(899)	(1,149)
IT Hardware, Licensing, and Support Costs	-	292	568	578	11,329	12,767
Measurement Canada Compliance	(146)	(909)	(903)	(1,478)	(15,119)	(18,555)
Total Capital	**(146)**	**(767)**	**(234)**	**(815)**	**(688)**	**(2,652)**
Operating Expenses						
New Operating Costs	-	875	1,529	1,556	28,236	32,196
Meter Reading	-	-	(998)	(2,544)	(54,574)	(58,116)
Disconnect/Reconnect	-	(133)	(414)	(544)	(12,176)	(13,267)
Meter Exchanges	-	(349)	(331)	(408)	(713)	(1,802)
Contact Centre	-	20	7	(20)	(1,163)	(1,157)
Total Operating Expenses	-	413	(208)	(1,961)	(40,390)	(42,146)
Theft Reduction	(383)	(987)	(1,711)	(2,835)	(87,789)	(93,705)

The table below shows the expected impact of the Kelowna municipal utility becoming part of the FortisBC service area, including City of Kelowna, and changes arising from Errata No. 1.

Table BCUC IR1 Q66.1 – Impact of City of Kelowna

AMI	Dec-13	Dec-14	Dec-15	Dec-16	Total 2017 - 2032	Total
Capital						
Sustaining Capital					-	-
Meter Growth and Replacement	-	(198)	(179)	(262)	2,705	2,066
Handheld Replacement	-	(250)	-	-	(899)	(1,149)
IT Hardware, Licencing, and Support Costs	-	297	573	583	11,411	12,864
Measurement Canada Compliance	(146)	(1,005)	(997)	(1,652)	(16,689)	(20,490)
Total Capital	(146)	(1,155)	(604)	(1,332)	(3,472)	(6,709)
Operating Expenses						
New Operating Costs	-	884	1,538	1,565	28,412	32,400
Meter Reading	-	-	(1,151)	(2,887)	(60,711)	(64,748)
Remote Disconnect/Reconnect	-	(152)	(475)	(624)	(13,952)	(15,202)
Meter Exchanges	-	(384)	(363)	(450)	(705)	(1,902)
Contact Centre	-	18	3	(27)	(1,312)	(1,317)
Total Operating Expenses	-	366	(447)	(2,422)	(48,268)	(50,771)
Theft Reduction	(431)	(1,110)	(1,925)	(3,190)	(98,762)	(105,418)

70.1 Please confirm that the impact of the City of Kelowna becoming part of the FortisBC service area is, on a preliminary basis, expected to create a 50% drop in meter growth and replacement sustaining capital, a 20.5% decrease in Operating Expenses and a 12.5% increase in Theft Reduction to the incremental non-project total operating costs by the year 2032.

70.2 Please provide the assumptions FortisBC used in calculating the above.

70.3 Please explain why adding the City of Kelowna would decrease the Meter Growth and Replacement Sustaining Capital.

71.0 Reference: Exhibit B-1, Application, Page 77 and Exhibit B-6, BCUC 72.3 and Exhibit B-6, BCUC 72.4 and Exhibit B-6, BCUC 72.4.1

7 1. In accordance with generally accepted accounting principles, the existing meters
8 would be written off over the 2014 to 2015 period as they are removed from
9 service; or

10 2. Depreciate the existing meters based upon the depreciation rate from the 2011
11 Depreciation Study included in the 2012-13 Revenue Requirements Application.
12 This would mean the existing meters would continue to be depreciated at the
13 rate derived from the life estimate of approximately 7 years as determined in the
14 2011 Depreciation Study; or

15 3. Depreciate the existing meters over a period longer than those proposed in the
16 first two options. In the absence of the AMI Project, the Company would be
17 writing off approximately 88,000 of its meters under Measurement Canada's
18 new sampling plan (S-S-06) over 21 years beginning in 2014.

15 Option 1 was considered the most appropriate as it is in accordance with US GAAP accounting
16 guidance and therefore does not require the Company to apply to the Commission for an
17 accounting variance.

24 Yes, the Company does propose to recover the accelerated depreciation of the existing meters
25 from ratepayers.

12 In all three options, the recovery of the cost of the existing meters would be included as a
13 charge to depreciation expense in the year in which the meters are removed from service.

71.1 Is this the only reason FortisBC selected Option 1?

71.2 Please explain the advantages and disadvantages of each option.

71.3 What effect would Option 2 and Option 3 have on customer rates versus Option 1?

72.0 Reference: Exhibit B-6, BCUC 1.72.5

5 The write-down of $8.59 million only includes the existing meters. The Company will still be
6 required to perform manual meter reads, consequently all of the related property, plant and
7 equipment including computer equipment and software and other equipment will be retained as
8 used and useful.

72.1 Please provide an estimate of the above property, plant and equipment that will be retained as used and useful.

72.2 For how long does FortisBC intend to retain in a used and useful state the above property, plant and equipment?

72.3 Does FortisBC intend to write the above property, plant and equipment off at a later date?

72.4 If so, at what date does FortisBC intend to do so?

73.0 Reference: Exhibit B-1, Application, Page 81 and B-6, BCUC 1.75.1

20 • An amendment to the provincial *Safety Standards Act* in 2006 obligates utilities, on
21 request, to provide municipalities with a report identifying premises with consumption
22 exceeding 93 kWh per day. This regulation is the basis for safety-focused initiatives
23 in various BC municipalities whereby, based on abnormal electric consumption,
24 municipal safety teams can inspect and shut down premises that exhibit unsafe
25 conditions.

11 683 residential accounts have used greater than 93 kWh/day every billing period since
12 September 2010.

73.1 Does the Safety Standards Act apply to commercial enterprises as well and if so, what threshold mechanism is used for commercial operations?

73.2 If not, does FortisBC have a means of tracking potential energy theft in commercial sites?

73.3 What proportion of residential accounts do these represent for each year?

74.0 Reference: Exhibit B-6, BCUC 1.76.1.1

Table BCUC IR1 Q76.1.1

	2013	2014	2015	2016	2017	2018	2019
Reported Estimated System Losses(MWhs)	320,512	326,788	332,545	336,688	340,846	345,539	350,086
Status Quo Scenario							
Total estimated theft sites	218	231	244	257	270	276	281
Annual Estimated losses per site(kWhs)	151,200	151,200	151,200	151,200	151,200	151,200	151,200
System Losses due to Theft (MWhs)	33,032	34,939	36,884	38,869	40,893	41,710	42,545
AMI Probable Scenario							
Total estimated theft sites	206	191	177	158	137	106	82
Annual Estimated losses per site(kWhs)	151,200	151,200	151,200	151,200	151,200	151,200	151,200
System Losses due to Theft (MWhs)	31,162	28,919	26,836	23,938	20,707	16,048	12,437
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Reported Estimated System Losses(MWhs)	354,687	359,574	364,470	369,158	374,079	378,976	383,850
Status Quo Scenario							
Total estimated theft sites	287	293	299	305	311	317	323
Annual Estimated losses per site(kWhs)	151,200	151,200	151,200	151,200	151,200	151,200	151,200
System Losses due to Theft (MWhs)	43,395	44,263	45,149	46,052	46,973	47,912	48,870
AMI Probable Scenario							
Total estimated theft sites	64	49	45	46	46	46	47
Annual Estimated losses per site(kWhs)	151,200	151,200	151,200	151,200	151,200	151,200	151,200
System Losses due to Theft (MWhs)	9,639	7,470	6,816	6,885	6,953	7,023	7,093
	2027	**2028**	**2029**	**2030**	**2031**	**2032**	
Reported Estimated System Losses(MWhs)	388,819	393,737	398,777	403,772	408,351	413,175	
Status Quo Scenario							
Total estimated theft sites	330	336	343	350	357	364	
Annual Estimated losses per site(kWhs)	151,200	151,200	151,200	151,200	151,200	151,200	
System Losses due to Theft (MWhs)	49,848	50,845	51,862	52,899	53,957	55,036	
AMI Probable Scenario							
Total estimated theft sites	47	48	48	49	49	50	
Annual Estimated losses per site(kWhs)	151,200	151,200	151,200	151,200	151,200	151,200	
System Losses due to Theft (MWhs)	7,164	7,236	7,308	7,381	7,455	7,529	

74.1 Please explain why FortisBC's annual estimated losses per site are expected to remain stable at 151,200 kWhs over 19 years under both the Status Quo scenario and the AMI probable scenario and why under the AMI scenario the losses per site would not shrink below the threshold for detection.

74.2 What is the threshold amount of theft which FortisBC expects to be able to detect, and please explain why this is the threshold.

75.0 Reference: Exhibit B-6, BCUC 1.77.1

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
							$000s							
Status Quo Revenue Protection	$ 235	$ 244	$ 248	$ 253	$ 257	$ 262	$ 267	$ 272	$ 276	$ 281	$ 287	$ 292	$ 297	$ 302
AMI Incremental	0	0	0	$ 118	$ 241	$ 245	$ 249	$ 254	$ 258	$ 263	$ 268	$ 273	$ 277	$ 282
Annual Total	$ 235	$ 244	$ 248	$ 371	$ 498	$ 507	$ 516	$ 526	$ 534	$ 544	$ 555	$ 565	$ 574	$ 584

	2024	2025	2026	2027	2028	2029	2030	2031	2032
					$000s				
Status Quo Revenue Protection	$ 302	$ 308	$ 313	$ 319	$ 325	$ 330	$ 336	$ 342	$ 349
AMI Incremental	$ 282	$ 288	$ 293	$ 298	$ 303	$ 309	$ 314	$ 320	$ 326
Annual Total	$ 584	$ 596	$ 606	$ 617	$ 628	$ 639	$ 650	$ 662	$ 675

75.1 What does the FortisBC cost for Status Quo Revenue Protection involve the company doing?

75.2 What is the current FortisBC likely threshold for theft detection and why is it at this level?

75.3 Please explain how the level of theft detection threshold will change with AMI and why.

76.0 Reference: Exhibit B-6, BCUC 1.78.2 and Exhibit B-6, BCUC 1.83.3

FortisBC customers financially benefit from marijuana grow operations that do not engage in the theft of service due to the increased number of billed kWh over which fixed utility costs are divided. This benefit is the same as the benefit received from any paying customer.

FortisBC has limited experience with paying marijuana grow operations since it is interested primarily in detecting and deterring theft. FortisBC does not request information from the RCMP for marijuana sites that have been busted and are paying for electricity.

76.1 Does FortisBC believe that the energy conservation derived from detecting and deterring energy use by paying marijuana grow operations will have a positive benefit to legitimate customers?

76.1.1 Would it be reasonable to anticipate that uncertainty regarding the presence of grow ops in residences and the damage caused by grow ops could negatively impact the value of homes and neighbourhoods?

76.1.2 Does FortisBC consider the presence of grow ops to be a hazard to the community?

77.0 Reference: Exhibit B-6, BCUC 1.78.3 and Exhibit B-6, BCUC 1.78.3.1

Since customers are on different read cycles and billing meters are read at different times over a multiple-month period, it is not possible to capture a "snap-shot" of the total system consumption. Consequently it is not currently possible to accurately determine system losses for any specific point in time. AMI deployment will enable the accurate and timely collection of

Estimates of total system losses have been used historically in the Company's Revenue Requirements and Cost of Service Analysis Applications. While these estimates are adequate for power purchase and cost allocation purposes, they are not as granular or as detailed as the network losses which could be measured following the installation of AMI meters. These more detailed loss measurements would allow FortisBC to proactively locate and address specific loss problems. Time-synchronized customer billing meter readings are required to make more detailed loss calculations. FortisBC's proposed AMI system is capable of producing these time-synchronized meter readings.

77.1 Please confirm that the AMI project is the only viable means of capturing the necessary "snap-shot" of total system consumption in order to determine system losses for a specific point in time.

77.2 How much more granularity does FortisBC require in order to locate specific loss problems and at what level does the granularity produce diminishing benefits?

78.0 Reference: Exhibit B-6, BCUC 1.79.1

13 Two percent is the forecast customer growth between 2011 and 2013 as filed in the FortisBC
14 2012-2013 Revenue Requirements Application, Table 3C. FortisBC chose to use this figure for
15 inflating marijuana grow operation numbers through 2032 since it is based on current forecasts.

16 If FortisBC instead used the P.E.O.P.L.E. 36[3] estimate of 1.2 percent average annual
17 population growth between 2011 and 2036 for the Status Quo marijuana operation growth, the
18 NPV of the theft benefit would increase to $42.1 million.

78.1 Please explain why FortisBC believes the forecast in the 2012-2013 Revenue Requirements Application, Table 3C is a superior forecast to the P.E.O.P.L.E. estimate of 1.2 percent annual average for this purpose.

78.2 Does FortisBC believe that marijuana grow operations can be expected to increase proportionately with the population. If so, please explain why.

79.0 Reference: Exhibit B-6, BCUC 1.79.2, Table and BCUC IR 1 Q.79.2 – Number of Lights

Table BCUC IR1 Q79.2 – Number of Lights

	Number of Lights 2005-2006	Number of Lights 2007-2011
	30	29
	8	50
	27	12
	2	33
	51	33
	58	42
		16
		16
		38
		32
		27
		19
		24
		34
		16
		114
Average	29.23	29.03

79.1 Why did FortisBC use thirty lights instead of the above indicated 29 lights as the estimate per site?

79.2 Please provide the information in Table BCUC IR1 Q79.2 – Number of Lights separately for each year from 2005 to 2011 inclusive.

79.3 Please confirm that the data in the above table is inclusive of all the years indicated, and that it indicates a total of 48 grow op sites caught stealing

electricity over the two year period of 2005 and 2006; and a total of 58 sites caught stealing electricity over the five year period from 2007 and 2011.

79.4 Are the numbers of lights per site identified in the table above depicted in chronological order?

80.0 Reference: Exhibit B-1, Application, Page 83

FortisBC has had a revenue protection program in place since 2006. Based on a three year average for the period 2009 – 2011, the program has identified an average 25 percent of known or suspected marijuana sites as diverting energy, which equates to a 75 percent deterrence factor as a result of FortisBC's current revenue protection activities. Applying the 75 percent deterrence factor to the estimated 824 grow sites in FortisBC's service territory in 2012 indicates that 206 grow sites are diverting electricity while the remaining 618 sites are assumed to be paying customers.

Revenue protection investigations have discovered an average of 8 percent of the total estimated theft sites annually. This implies that in 2012, 16 of the estimated 206 sites engaged in theft will be identified and the remaining 190 sites will be undetected representing an annual revenue loss of $3.7 million in 2012.

80.1 Please explain how the above revenue protection program has calculated that it has identified on average 25% of known or suspected marijuana sites as diverting electricity.

80.2 Please provide the annual number of known or suspected marijuana sites diverting energy for each of the years 2009, 2010 and 2011 and the number identified by the revenue protection program and the source of the numbers.

80.3 Please explain why FortisBC estimate of theft as a percentage of grow operations is so much less than the 50% estimate in the Plecas studies.

80.4 Please explain FortisBC's 25% theft estimate versus the estimates used by BC Hydro and explain why there is a difference if any.

81.0 Reference: Exhibit B-1, Application, Page 85

- The average number of lights recorded by FortisBC at licensed sites shut down by the RCMP for illegal production is trending well above the 36 reported by Plecas. If

81.1 Please provide the trend that FortisBC has identified.

82.0 Reference: Exhibit B-6, BCUC 1.81.1

In light of these evolving detection risk considerations, FortisBC considers it reasonable that there would be both an increase in paying sites and an increase in the use of alternative energy sources. Both of these responses by illegal marijuana grow sites are logical given the increased risk of the theft detection and the stable risk of paid consumption detection.

82.1 Does FortisBC consider that the use of alternative energy would be more costly for a grow operation than paying FortisBC?

83.0 Reference: Exhibit B-1, Application, Page 89 and Exhibit B-6, BCUC 1.82.1 and Exhibit B-6, BCUC1.86.2

7 The savings from energy theft reduction will be realized in accordance with the two phases
8 discussed above. The Company expects to increase detection of energy theft from 8 to 15
9 percent in 2014 -2015 due to the productivity gains and improved data analysis associated
10 with initial deployment. The introduction of energy balancing beginning in 2015 is expected
11 to increase the deterrent impact to 84 percent by 2016, and improve detection capabilities to
12 25 percent by 2016. The progression of recoveries for the life of the Project is detailed in
13 the table below.

18 The theft benefit per customer of FortisBC AMI deployment is estimated at $330 ($38 million
19 NPV benefit divided by 115,000 customers) which compares favourably with the BC Hydro theft
20 benefit of $406 ($732 million NPV benefit divided by 1,800,000 customer) as estimated from
21 data in the published Business Case, which suggests similar assumptions are used.

29 The detailed methodology used in identifying electric theft and the subsequent results is
30 necessarily sensitive in nature. FortisBC confirms that it has discussed with BC Hydro their
31 approach to identifying electricity theft and their successes/challenges to date under a Non -
32 Disclosure Agreement. The benefit of this discussion is reflected in FortisBC's approach to theft
33 reduction in Tab 5.3.2 of the Application and it is expected that collaboration will continue as
34 more experience is gained by both parties.

83.1 Does the information obtained from BC Hydro relate particularly to the FortisBC estimate of expected benefits to be obtained in 2014 and 2015 based on the initial deployment?

83.2 Given that FortisBC's estimate of $330 in net theft benefit per customer is approximately 20% lower than BC Hydro's estimate of $406 per customer has FortisBC identified particular challenges that have led FortisBC to reduce assumptions regarding the effectiveness of the theft reduction program?

83.3 Please compare the assumptions used by BC Hydro and FortisBC.

84.0 Reference: Exhibit B-1, Application, Page 88 and Exhibit B-1, Application, Page 89, and Exhibit B-6, BCUC 1.82.7

13 Feeder meters, as distinct from those to be installed at customer homes or businesses, will
14 be installed at key points on FortisBC distribution feeders. These meters monitor cumulative
15 electricity loads on an hourly or more frequent basis and will measure the total electricity
16 supplied to a specific area. Based on the data supplied by the feeder meters, AMI-

1 This AMI feature is expected to increase theft detection to 25 percent by 2016 and gradually
2 increase deterrence from 75 to 84 percent by 2016. Results from this initial approach will be
3 reviewed to determine if additional capital investment will generate satisfactory incremental
4 returns and if warranted, FortisBC will seek approval of new capital and operational
5 investment in a separate filing.

13 The Application states in several sections the intent to collect hourly consumption data from
14 advanced meters installed at customer premises (please refer to pages 3,19, 46, 51 and 55
15 from the Application). There is no intent at this time to collect consumption data at half-hourly
16 intervals.

84.1 Would theft detection from energy balancing be improved by having information at the customer and feeder meters being collected at less than hourly intervals?

84.1.1 Please explain why or why not.

84.2 Would FortisBC require different feeder meters in order to measure electricity supplied to a specific area at half-hourly intervals?

84.2.1 If so, what would be the cost of feeder meters that could collect consumption data half-hourly or more frequent intervals?

84.2.2 If not, what is the shortest interval for which the feeder meters can measure the total electricity supplied to a specific area?

84.3 What is the shortest interval for which customer meters can measure the electricity supplied to their premises?

84.4 Reference: Exhibit B-1, Application, Page 37 and B-6, BCUC 1.92.2 and Exhibit B-6, BCUC 1.92.2.1

14 kilometres driven when locating the source of unplanned power outages. As well, the
15 remote disconnect/reconnect functionality of the AMI system will eliminate the need to drive
16 to customer premises to complete a disconnection or reconnection of service.

7 The charge for Normal working hours is $100.00. The charge for Overtime hours is $132.00
8 and the charge for Callout hours is $339.00.

14 Once the AMI project is completed, the marginal cost of a remote reconnection is likely to be
15 less than $10, meaning that in theory the reconnection fee could be dropped substantially.
16 However, FortisBC proposes to maintain the current reconnection charge until the next COSA in
17 order to better understand all costs associated with the new processes.

18 The reconnection charge also deters disconnections, the costs of which are borne by all
19 customers. Although disconnection process costs would go down with the AMI project, there are
20 still related costs such as site visits for 50% of vacant sites and 100% of non-pay sites (Exhibit
21 B-1, Section 5.3.3, p60) and the contact centre processes related to non-pay disconnects.

84.4.1 Please confirm that the AMI system could eliminate the need to drive to customer premises to complete either a disconnection or reconnection of service except for 50% of vacant sites and 100% of non-pay sites.

84.4.2 When does FortisBC anticipate that the next COSA will be?

84.4.3 What years did FortisBC submit its last three COSAs?

84.4.4 How often does BC Hydro submit COSAs to the Commission?

84.4.5 Please identify and quantify the existing disconnection process costs and the expected disconnection process costs under AMI.

84.4.6 Please explain how FortisBC defines Call Out and explain under what circumstances FortisBC would apply either the $339.00 Call Out charge or the $132 overtime charge if the AMI program were implemented.

84.4.7 Would FortisBC agree that in the event Opt Out were permitted it would be appropriate to charge substantially different disconnection and reconnection charges to customers who had "Opted Out" than to customers who have remote disconnect and reconnect capability under the AMI program?

84.5 Reference: Exhibit B-1, Application, Page 98 and B-6, BCUC 1.100.1

8 to maintain a power factor of not less than 90 percent lagging, FortisBC is only able to
9 practically apply this requirement to commercial customers subject to a demand component
10 as part of their billing. Moreover, as commercial customers subject to demand billing are
11 billed on demand as measured in kVA (apparent power), customers exhibiting a poor power
12 factor are automatically penalized by an increased demand charge (providing additional
13 revenue to mitigate system impacts) than would otherwise be realized with an improved
14 power factor. The current metering used for the majority of FortisBC's customers does not
15 permit any determination of power factor (and thus the application of section 7.4 of the
16 Electric Tariff), greatly limiting any potential for the Company to address poor power factor
17 on the distribution network.

4 For clarity, the discussion in Section 6.1 of the Application refers to the ability of the AMI system
5 to determine power factor at all customer end-points. While this does include residential
6 customers, FortisBC's expectation is that low power factor concerns are more likely with other
7 customer classes such as commercial and irrigation customers. This is because the latter often
8 have large electric motor loads as compared to residential customer loads which are primarily
9 resistive (lighting and heating).

20 However, as discussed in the response to BCUC IR1 Q100.1, it is expected that low power
21 factor issues will be more probable with other customer classes, and that residential power
22 factor is not expected to be a significant concern.

84.5.1 Please clarify and quantify if those commercial customers subject to demand billing and exhibiting a poor power factor are penalized by the increased demand charge more than the cost associated with the poor power factor.

84.5.2 How many commercial customers does FortisBC have that are and are not subject to a demand component as part of their billing?

84.5.3 Please explain how a commercial customer not currently subject to demand billing but found to have a poor power factor with the information obtained in the AMI program will be affected.

84.5.4 Does FortisBC expect that low power factor impacts will be a 'significant' issue with respect to some commercial customers?

84.5.4.1 If so, please supply any estimates that FortisBC has with respect to the incremental savings that may be derived from commercial customers where power factors can be improved.

85.0 Reference: Exhibit B-1, Application, Page 102 and Exhibit B-1, Application, Appendix C-4, Page 12 of 44

13 Table 6.3.a – Potential Savings from Outage Management System Deployed in 2014

Forecast Savings ($000s)							
Outage Management System	2013	2014	2015	2016	2017	2018	2019
	-	830	(68)	(138)	(141)	(143)	(146)
	2020	2021	2022	2023	2024	2025	2026
	(148)	(151)	(154)	(157)	(159)	(162)	(165)
	2027	2028	2029	2030	2031	2032	
	(168)	(171)	(174)	(177)	(181)	(184)	

14 FortisBC expects to finalize the development of a business case for the implementation of
15 an OMS for inclusion as part of a future regulatory application with submission possibly in
16 2015.

Outage Management Efficiencies	$10	$5-$15

85.1 Why did FortisBC elect to address Outage Management system as a separate regulatory application instead of including it in the business case for AMI as did BC Hydro in the SMI project?

86.0 Reference: Exhibit B-6, BCUC 102.3

9 FortisBC is considering the acquisition, in 2014/2015 of an Outage Management software
10 System (OMS) that will leverage the information from the AMI meter, CIS (Customer Information

86.1 In considering the acquisition of an Outage Management software system, what factors would FortisBC believe would detract from the purchase of OMS?

86.2 Please identify all circumstances in which FortisBC does not believe it would proceed with the purchase of an OMS system.

86.3 Reference: Exhibit B-6, BCUC 1.105.1

12 Please see the table below which provides the unit cost for digital and electro-mechanical
13 meters currently in use by FortisBC. Due to contractual sensitivities, the unit cost of the
14 proposed AMI meter has been filed with the Commission in confidence.

Meter Type	Unit Cost
Single phase electromechanical meter	$36.84
Single phase digital meter	$30.11

15

86.3.1 Please confirm that the single phase electromechanical meter is not still and will not be available for purchase throughout the 20 year study period.

87.0 Reference: Exhibit B-1, Application, Page 32 and Exhibit B-6, BCUC 1.16.1 and 107.1

17 to better understand their bills and manage their consumption. Increased awareness and
18 access to more information has proven an effective tool that allows customers to modify
19 their usage habits in an effort to lower their bills and save energy as detailed in the Navigant
20 report provided as Appendix C-1. As part of its 2012 Long Term Resource Plan, FortisBC
21 has included estimated savings of 2.3 GWh beginning in 2015 and increasing to 8.9 GWh by
22 2025 related to the behavioural changes enabled by the FortisBC online web portal.

16 portal savings range from 2.2 in 2015 to 5.3 GWh in 2025.. The corrected customer information
17 portal savings, by year, and the dollar value of each is shown in the following table. The
18 incorrect figures do not affect the application as the customer information portal benefits were
19 not factored in (please see the response to BCUC IR1 Q16.2 response).

87.1 Would the 2012 Long Term Resource Plan need to be revised in the event that the AMI project did not proceed and the online web portal was not available?

87.2 Why did FortisBC not include any portion of the customer information portal benefits in the AMI application?

88.0 Reference: Exhibit B-1, Application, Pages 44 and 45

14 IHDs. A recent survey[5] by the US Department of Energy and CenterPoint Energy of
15 participants in a smart meter In-Home Display pilot program showed positive results with 71
16 percent of participants reporting that they changed their electricity consumption behaviour

1 habits. These savings will be included in future PowerSense DSM applications to the extent
2 that the Company provides a related incentive.

88.1 Why will FortisBC limit the potential for consumption savings to PowerSense DSM applications in which the company provides a related incentive?

89.0 Reference: Exhibit B-1, Application, Appendix C-1, Page 40 of 65 and Exhibit B-6, BCUC 107.1

The Hydro One TOU pilot had 13% of the customers solicited agreeing to the TOU rates, of these, 72% said that they would like to stay on the TOU rates implying long-term participation rates of 9%. The NewMarket Hydro TOU pilot was run as an opt-out program. Approximately 37% of the customers opted out.

1 • Delaying requirement for new generating facilities and transmission and distribution
2 infrastructure, lowering costs for all customers;
3 • Reducing future power purchase expense (as shown in Table 6.5a);
4 • Inasmuch as some market-based power supply alternatives may be fossil fuel based, a
5 reduction in any reliance on such resources provides an environmental benefit.

6 These drivers are relevant to FortisBC now, which is why the Company has contemplated the
7 implementation of time-varying rates in the AMI CPCN.

89.1 Does FortisBC agree that customer adoption of conservation practices will likely increase with familiarity of conservation rate programs and the technology that supports them?

89.1.1.1 Does FortisBC have a forecast as to how adoption of conservation practices may increase from year to year after implementation of IHD and conservation rate structures? If so, please provide.

89.1.1.2 What measures can FortisBC take to enhance and increase response rates over time?

89.2 Does FortisBC agree that a delay in the adoption of technologies such as AMI that support conservation rate structures will contribute to delays in the adoption of conservation practices and the achievement of related benefits such as those above?

90.0 Reference: Exhibit B-6, BCUC 1.109.1.2

24 The availability of a CPP option could be beneficial today in unusual contingency events.

90.1 What unusual contingency events would make the availability of a CPP option beneficial today and how frequently might each occur based on past experience or general utility experience?

90.2 What might be the impact in quantitative ($) terms of each of the possible contingency events as an average expected impact?

91.0 Reference: Exhibit B-6, BCUC 1.109.1.2

1 FortisBC is not forecasting very high critical peak period prices in its resource plan, but in the
2 event that they occurred, the effect could be viably mitigated through a residential CPP rate
3 structure.

91.1 What price would FortisBC consider as 'very high critical peak period prices'?

91.2 Does FortisBC have a risk factor and/or trigger event identified by which the above very high critical peak period prices could occur?

92.0 Reference: Exhibit B-1, Appendix C-1, Page 31 of 65 and Exhibit B-6, BCUC 1.110.2

Table 14: BC Hydro's Commercial and Industrial Elasticity Forecast Estimates lists estimates for elasticity of commercial and industrial customers used by BC Hydro in their 2006 and 2007 load forecast. C&I sectors have higher elasticities (-0.1 to -0.2) than the residential sector (roughly -0.05) which suggests C&I industries are more responsive to price changes. For example, during high price periods, industrial customers are more likely to shift demand to off-peak periods in order to reduce costs.

20 **Table BCUC IR1 Q110.2a - Commercial**

	Participation Rate	Per Participant Savings (Capacity) Incremental to RIB	Per Participant Savings (Energy) Incremental to RIB	2016 Power Purchase Savings ($000s)	2020 Power Purchase Savings ($000s)	2030 Power Purchase Savings ($000s)
TOU	20%	10.50%	3.60%	486	523	643
CPP	20%	9.50%	0.00%	63	84	164
PrePay	8%	5.30%	9.80%	369	386	431

21

92.1 Please explain why FortisBC has adopted the same participation rates for Commercial, Industrial and Wholesale customers as those for residential when commercial and industrial customers have been found to have higher elasticities than the residential sector?

93.0 Reference: Exhibit B-6, BCUC 1.111.4

23 Yes, FortisBC considers that a significant uptake of electric vehicles could result in additional
24 supply infrastructure necessary to support this un-forecast load growth. The potential impact is
25 highly dependent on a number of factors:

26 • The rate of customer uptake of electric vehicles;

27 • The geographic distribution of customer adoption (i.e. are the vehicles clustered in
28 specific areas of the FortisBC service area); and

29 • Whether the vehicles are charged during on-peak or off-peak times.

93.1 Why did FortisBC not forecast the load growth associated with electric vehicles?

93.2 Would FortisBC consider the BC Hydro forecast of electric vehicle requirements an adequate proxy as a forecast for the growth of electric vehicles? If not, why not?

94.0 Reference: BCUC 1.111.1.4.1

5 Technology available in today's electric vehicle charging stations allows for "economy charging"
6 without the assistance of AMI networks. If customers purchase charging stations with Time-of-
7 Use metering installed on the EV circuit, the charging station can be configured to charge only
8 when the power rates are at their lowest. Economy charging requires no action, other than
9 plugging in the electric vehicle. At least two vendors offer charging equipment with this
10 functionality.

94.1 Please identify the types of customer benefits for economical charging of electric vehicles that would be available under the AMI program that would not be available by 'economy charging' without the assistance of AMI networks, if any.

94.1.1 Please distinguish between advantages for residential customers and commercial fleet customers if applicable.

95.0 Reference: Exhibit B-6, BCUC 1.116.1

5 Direct contact with customers via a site visit to the premises is the most frequently-used form of
6 contact for an account being disconnected for non-payment. The FortisBC process is to contact
7 a customer either by hanging a 48-hour door tag at the premise or speaking to them via phone.
8 FortisBC believes that these notifications, and the internal policy that requires at least two points
9 of contact with the customer, provide adequate notification for making payments or
10 arrangements. This policy is also compliant FortisBC Electric Tariff guidelines.

95.1 Please confirm FortisBC always has or tries to have direct contact with the customer either through a site visit or telephone call prior to disconnection.

95.2 Does FortisBC consider leaving a voicemail as a point of contact with the customer?

95.2.1 If so, would this be considered sufficient as one of the two points of contact required prior to disconnection for non-payment?

96.0 Reference: Exhibit B-6, BCUC 1.117.1

29 FortisBC is not aware of any states or provinces that allow opt-out for no fee.

30 FortisBC understands that the following states and provinces permit electric utility customers to
31 opt-out of a "smart meter" program for a fee:

96.1 Does FortisBC have a definition of opt out for each state or province on the list? If so, please provide.

96.2 Please identify the fees that are being charged for individuals to opt-out of the smart meter programs identified in the list.

96.3 Does FortisBC believe that the fees being charged to opt-out would be likely be sufficient to cover the expenses incurred and/or the foregone benefits caused by the opt-out? Please explain.

97.0 Reference: Exhibit B-6, Appendix and BCUC IR 1.22.1 and Exhibit B-6, BCUC 1.22.2

11 FortisBC does not propose to charge customers to change their billing date.

A customer-selected due date was the clear favorite among these options, with 47 percent of respondents saying they were "somewhat interested" or "very interested" in participating (**Figure 1**). The popularity of this program indicates that it may be another weapon in the utility arsenal against low customer satisfaction scores.

97.1 Is FortisBC intending to implement customer-selected due dates, and if so, when?