December 14, 2012

Via Email<br>Original via Mail

Ms. Erica Hamilton
Commission Secretary
BC Utilities Commission
Sixth Floor, 900 Howe Street, Box 250
Vancouver, BC V6Z 2N3
Dear Ms. Hamilton:
Re: FortisBC Inc. (FortisBC) Application for a Certificate of Public Convenience and Necessity (CPCN) for the Advanced Metering Infrastructure Project - BC Utilities Commission Information Request No. 2

Please find attached FortisBC's responses to Information Request No. 2 from the British Columbia Utilities Commission (BCUC or the Commission).

Sincerely,


Dennis Swanson
Director, Regulatory Affairs
cc: Registered Interveners

### 1.0 Reference: Description of Existing System

## Exhibit B-6, BCUC IR 1.5.1

Failure of existing electromechanical meters
"The following describes how the model used simulates the lifespan of the meter:

- Each year a lot came up for compliance testing, a random number from 1-10 was generated. This random number was used to determine the outcome of the testing process. For example, if targeting level 3 , a random number of 1-4 meant the lot was assigned to level 3 , a random number of 5-7 corresponded to a level 4 and if the random number was between 8-10 then the lot was assumed to fail testing;
- Based on this predicted level, an extension period was assigned to the compliance group, and used to calculate a new seal date;
- A meter was replaced either when it was predicted to fail compliance testing by the model, or at the expiry of its seal date after reaching level 4;
- This procedure was repeated sufficiently to simulate the entire life of the meter.

Based on the model used by FortisBC, all electro-mechanical meters are expected to have failed statistical testing and therefore will need replacement by 2034. It should be noted that more than half of these replacements are predicted to occur in the first 6 years as evidenced by the following table."
[Ref: Exhibit B-6, p. 10] [emphasis added]
1.1 Please explain if the model was run once, with one set of random numbers, or a number of times to produce a range of results. If a range was calculated, are the results presented the average of these results?

## Response:

FortisBC ran the referenced meter replacement model 10 times. The resulting numbers estimating the number of meter exchanges and replacements needed each year is an average of these 10 iterations.
1.2 Please explain at what future date all the existing 35,000 digital meters will have failed statistical testing and require replacement.

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Response:
FortisBC expects all existing digital meters to be replaced after failing its compliance sampling program by 2042.
1.3 Please show how the potential integration of the Kelowna 15,000 meters affects the results for both the electro-mechanical and the digital replacements.

## Response:

As is noted in the Addendum to the Application, filed November 16, 2012 (Exhibit B-1-2), regarding the acquisition of the City of Kelowna utility, section 3.1.5, pg 8, "In the absence of detailed information, FortisBC has estimated the compliance testing and failure rates for the additional meters from CoK by assuming that they were extended or replaced at the exact same rate as that calculated for the FortisBC meter population." Given that assumption, the additional City of Kelowna meters add to the FortisBC numbers as per the table below.

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Table BCUC IR2 Q1.3 - Forecast Meter Replacements with CoK

|  | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| FBC EM meters |  | 3678 | 3501 | 6884 | 3884 | 11168 | 4407 | 7204 | 4708 | 3738 | 5567 |
| CoK EM meters |  | 503 | 479 | 942 | 532 | 1529 | 603 | 986 | 644 | 512 | 762 |
| Total EM Meters to be Replaced (inc CoK) |  | 4181 | 3980 | 7826 | 4416 | 12697 | 5010 | 8190 | 5352 | 4250 | 6329 |
| FBC Electronic Meters |  | 617 | 668 | 441 | 535 | 424 | 334 | 449 | 642 | 691 | 674 |
| CoK Electronic Meters |  | 59 | 64 | 42 | 51 | 40 | 32 | 43 | 61 | 66 | 64 |
| Total Electronic Meters to be Replaced (inc CoK) |  | 676 | 732 | 483 | 586 | 464 | 366 | 492 | 703 | 757 | 738 |
| Total Meters to be replaced |  | 4857 | 4712 | 8309 | 5002 | 13161 | 5376 | 8682 | 6055 | 5007 | 7067 |

1.4 Please explain the concepts of "replacements", "exchanges", and how they interrelate.

## Response:

A meter is "replaced" upon seal expiration when its compliance group has failed testing during compliance sampling activities. A meter is "exchanged" when it is temporarily removed from the meter population as a sample of its compliance group.

In the past, meters being replaced were written off, but meters being exchanged could be combined to create a new compliance group and subsequently recertified and put back into the meter population. New requirements for homogeneity under Measurement Canada's new SS-06 guidelines will effectively eliminate this re-grouping, at least for FortisBC's existing electromechanical meter population.

For FortisBC's existing meter population under SS-0-6, both meter exchanges and replacements will result in a new meter at the customer premise and with the existing meter being written off.
1.5 Please explain how the 11,131 meters in the "exchanges" column of the response to BCUC IR 1.5.1 relate to the 18,055 meter exchanges in the Status Quo section of the response to BCUC IR 1.48.3. Please provide the relevant numbers of electro-mechanical and digital meters being exchanged.

## Response:

The difference between the "exchanges" column in the response to BCUC IR No. 1 Q5.1 and the chart in response to BCUC IR No. 1 Q48.3 is that the latter (Status Quo) numbers include the exchange/replacement of digital meters, whereas the former does not. Please see the chart below for the breakdown of electro-mechanical versus digital meters being exchanged.

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1 Table BCUC IR2 Q1.5 - Forecast Electro-mechanical and Electronic Meter Replacements

| Electro- | Electronic | Total |  |
| ---: | ---: | ---: | ---: |
| Mechanical |  | 356 | $\mathbf{1 7 6 8}$ |
| 1412 | 356 | $\mathbf{1 6 1 2}$ |  |
| 1256 | 568 | $\mathbf{2 0 5 9}$ |  |
| 1491 | 506 | $\mathbf{1 4 1 1}$ |  |
| 905 | 412 | $\mathbf{2 7 0 7}$ |  |
| 2295 | 312 | $\mathbf{1 3 0 8}$ |  |
| 996 | 406 | $\mathbf{6 4 3}$ |  |
| 237 | 468 | $\mathbf{7 3 6}$ |  |
| 268 | 487 | $\mathbf{8 9 6}$ |  |
| 409 | 81 | $\mathbf{8 8 4}$ |  |
| 803 | 337 | $\mathbf{5 9 6}$ |  |
| 259 | 350 | $\mathbf{4 8 6}$ |  |
| 136 | 318 | $\mathbf{4 9 0}$ |  |
| 172 | 256 | $\mathbf{5 2 7}$ |  |
| 271 | 431 | $\mathbf{4 9 2}$ |  |
| 61 | 418 | $\mathbf{4 4 4}$ |  |
| 26 | 612 | $\mathbf{6 5 5}$ |  |
| 43 | 237 | $\mathbf{2 6 6}$ |  |
| 29 | 100 | $\mathbf{1 6 2}$ |  |
| 62 | 181 | $\mathbf{1 8 1}$ |  |
| 0 | $\mathbf{1 8 1}$ |  |  |
| 0 | 370 | $\mathbf{3 7 0}$ |  |

### 2.0 Reference: Project Need

## Exhibit B-6, BCUC IR 1.13.1

Order C-11-07
Historical perspective - Distribution Substation Automation Program (DSAP)
"referenced page 11 of Appendix A to Order C-11-07, which states: 'The Commission Panel therefore concludes that replacing the existing legacy technology with new electronic technology is appropriate.'"
[Ref: Exhibit B-6, p. 28]
2.1 Please confirm whether the reference relates to substation automation or customer metering.

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## Response:

The reference relates to distribution substation metering. For clarity, the reference is intended to support the Company's definition of the "smart grid" as the application of digital technology to improve the efficiency, safety, reliability and cost-effectiveness of the electric power system. This reference demonstrates that the Commission has previously deemed such applications of technology (as in the case of the DSAP project) as appropriate and of benefit to FortisBC's ratepayers. The proposed AMI Project is a key component in the development of the smart grid, particularly with respect to the associated communications technology that ensures information can be made available from all devices on the distribution grid. The application of AMI digital technology, as discussed in the Application, is clearly of benefit to customers, and is appropriate.

### 3.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IR 1.15.2
Financial Benefits to FortisBC
3.1 Please explain and quantify any non-ratepayer financial benefits of the proposed AMI project that will accrue to FortisBC.

## Response:

As approved by Order G-58-06, the Company has a deemed capital structure of 60 percent debt and 40 percent equity, with an allowed Return on Equity of 9.9 percent approved pursuant to Order G-162-09. Line 76 from Exhibit B-1-1 details the forecast return on equity for the Project the financial analysis.

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### 4.0 Reference: Project Need

## Exhibit B-6, BCUC IR 1.16.2

Conservation Rate Structures
"If the CIP savings were included in the AMI project analysis, there would be no change in project costs and the NPV of the project would improve to an estimated $\$ 20.9$ million." [Ref: Exhibit B-6, p. 31]
4.1 Please confirm, or otherwise explain, that if the Customer Information Portal (CIP) savings were included in the Net AMI project analysis, the NPV of the project would improve by $\$ 3.3$ million.

## Response:

Confirmed.

### 5.0 Reference: Project Description

Exhibit B-6, BCUC IRs 1.33.1, 1.48.3, 1.105
Exhibit B-1, Table 5.1a, p. 70
Exhibit B-11, CEC IR 1.50.7
Continued Manual Meter Reads
"Response: FortisBC would need to install a meter without RF radios or a meter with RF radios that are inactive." [Ref: Exhibit B-11, CEC 1.50.7, p. 864 of 946]
5.1 Please confirm, or otherwise explain, that using 2016 for comparison the cost for manual meter reads, primarily due to the locations involved, will increase approximately 8.5 times from $\$ 22.55$ to $\$ 192.69$ per year per customer meter, a differential of $\$ 170.14$ per year.

## Response:

Confirmed.

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5.2 Please confirm, or otherwise explain, that 1 percent of the anticipated 123,293 meters in 2016 would be 1,233 meters.

## Response:

Please see the response to BCUC IR No. 1 Q33.1. The anticipated number of meters in 2016 is 123,371, (which includes MV90 industrial/wholesale meters), of which 1 percent would be 1,234.
5.3 Please confirm, or otherwise explain, the cost of changing out a meter is projected to be $\$ 198.36$ in 2016 as indicated in the response to BCUC IR 1.48.3, and the cost of a digital meter is $\$ 30.11$ in 2012 as indicated in BCUC IR 1.105.2.

## Response:

FortisBC confirms that absent AMI, in the Status Quo scenario, the cost of meter exchanges is projected to be $\$ 198.36$ in 2016, and confirms that the current (2012) cost of a digital meter is \$30.11.
5.4 Please also confirm, or otherwise explain, that the cost of acquisition and deployment of the AMI meters will be $\$ 20.323$ million as indicated in Table 5.1a on page 70 of Exhibit B-1, and for the 116,410 AMI meters in 2013/2014 would be an average cost of approximately $\$ 209.50$ per meter.

## Response:

Confirmed that, as per the referenced Table 5.1a on page 70 of Exhibit B-1, acquisition and deployment of the AMI meters will be $\$ 20.323$ million. Also confirmed that as per the response for BCUC IR No. 1 Q48.3, total meters in service at the end of 2013 is forecast to be 116,410.

However, given these two inputs, the indicated cost per meter (installed) is $\$ 20.323$ million divided by 116,410 meters equalling $\$ 174.58$ per meter (installed).

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5.5 Please confirm, or otherwise explain, that it is more cost effective to install an AMI meter than to install a digital meter and later change it out to an AMI meter.

## Response:

## Confirmed.

5.6 Please confirm, or otherwise explain, that an AMI meter can be installed with the RF transmission capability disabled, and the RF transmission capability can be enabled remotely should a new customer at that location request it. Please provide the incremental costs involved.

## Response:

An AMI meter can be installed with the RF transmission capability disabled, however, the RF transmission capability can only be disabled remotely. Once the RF radio is off, it can only be enabled by an on-site process at the meter. A meter technician would need to visit the meter and, using an optical probe, "enable" the RF transmissions. The cost for this is estimated at approximately $\$ 22$ (the same as the per-manual download "opt-out" rate based on 0.5 percent of customers).
5.7 Please confirm, or otherwise explain, that if a customer requested a meter without RF transmission enabled, a charge of $\$ 170.14$ per year, for 2016 , would keep the other ratepayers whole.

## Response:

Please refer to the response to CEC IR No. 1 Q50.6. To clarify, assuming 0.5 percent of customers opt-out and have a radio-off AMI meter installed, the one-time fee would be $\$ 110$. A per manual read download fee of $\$ 22$ is forecast in the response to CEC IR No. 1 Q50.6.1. $\$ 22$ per read, multiplied by six reads per year, equals $\$ 132.00$ per year.

### 6.0 Reference: Project Description <br> Exhibit B-6, BCUC IR 1.47.3 <br> Meter Deployment and Customer Safety <br> "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. <br> 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." [Ref: Exhibit B-6, BCUC IR 1.47.3, p. 88] [emphasis added] <br> 6.1 Please provide the amount budgeted for the over 1,000 meter base replacements as part of the AMI project.

## Response:

Fortis $B C$ has budgeted approximately $\$ 0.14$ million related to possible meter base replacement as part of the AMI Project.

### 7.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IRs 1.54.0, 1.82.4
Exhibit B-11, CEC IRs 1.18.1, 1.22.0, 1.66.1, and 1.77.2
Theft Analytics
"FortisBC has previously tested a manual approach to energy balancing at the feeder level as a means of theft detection and has concluded that the installation of feeder meters without the accompanying advanced meters as an effective tool to identify electric theft is not practical for the following reasons.

- It is not possible to accurately synchronize the meter readings on the feeder meters with the cumulative consumption recorded by the current meter system as the readings cannot be collected simultaneously, (it takes a meter reader several hours to read a route and each feeder may have several routes which
are read on different days depending on the geography and customer population).
- If one accepts inaccuracies introduced by a manual meter reading approach to energy balancing at the feeder level, specific theft identification would still require repeated manual re-reading of meters downstream of primary metering to begin locating the source of unusual losses.

The repeated and non-standard nature of the manual meter readings required for this type of energy balancing would alert electricity thieves to the theft detection activities of the Company."
[Ref: Exhibit B-6, BCUC IR 1.82.4, pp. 184-185] [emphasis added]
"The geographic area will vary depending on customer density on the feeder. Initial investigation on urban feeders will target approximately groups of 150 sites. For rural feeders the proposed target is groups of 50 sites." [Ref: Exhibit B-11, CEC 1.22.1.2, p. 825 of 946] [emphasis added]
"The deployment of the proposed distribution metering to assist in identifying energy theft is not effective in the absence of advanced meter deployment at the customer premise. Energy balancing requires the simultaneous reading of feeder and customer meters to identify losses. This is not possible with the current meter technology which is manually read on a 60 day cycle."
[Ref: Exhibit B-11, CEC 1.22.1.3, p. 825 of 946] [emphasis added]
"FortisBC has readers working out of 7 different offices throughout its territory. Due to the different headquarters which present diverse challenges in each region, on average a meter reader reads approximately 160 meters per day. The maximum number a reader could read in a day would be 1,100 meters." [Ref: Exhibit B-11, CEC IR 1.66.1, p. 886 of 946] [emphasis added]
"The feeder will then continue to be divided into more granular sections using feeder metering until the source of loss is precisely identified at a particular meter."
[Ref: Exhibit B-11, CEC 1.77.2, p. 903 of 946] [emphasis added]
7.1 Please confirm, or otherwise explain, that if electricity thieves were deterred by sight of the Revenue Protection activities this would likely result in decreased or reduced theft which would be a positive result.

## Response:

FortisBC currently conducts theft investigations in a very inconspicuous manner so as not to be observed by the customer at the premises. The deliberate lack of visibility reduces safety risks
for those conducting the investigation and improves the chances of confirming suspected incidences of theft. Site investigations are often performed during off hours to avoid detection and to coincide with the timing of peak loads associated with marijuana production.

It has been the Company's experience that marijuana producers who steal electricity are resourceful and often use photocell or other technologies to temporarily shut down the theft load when anyone resembling a utility employee enters the property. FortisBC has also been advised that an operation can be dismantled overnight and the plants moved to an alternate site.

The obvious presence of Revenue Protection activities associated with a manual approach to energy balancing may merely result in a temporary modification in the behaviour of stealing customers versus a longer term deterrent effect, and will increase safety risks for FortisBC employees. The premise in the Application is that the discreet and unpredictable nature of strategic energy balancing will yield better results, improve safety and will more effectively deter producers generally from theft, which is a positive result of the proposed AMI Project.
7.2 Please confirm, or otherwise explain, the response to CEC IR 1.18.1 lists the 129 distribution feeders and the 146,583 customer endpoints for an average of 1,136 customer endpoints per feeder.

## Response:

Not confirmed. While the response to CEC IR No. 1 Q18.1 does list 129 distribution feeders, the total number of customer endpoints listed is 110,589 . This corresponds to an average of 857 customer endpoints per feeder.
7.3 Please provide an estimate of the average number of customer endpoints per transformer on a feeder, and compare this number to the average meter reader reads per day, and to the $50-150$ sites limit identified in the response to CEC IR 1.22.1.2.

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## Response:

FortisBC has 31,371 distribution transformers in its service area and 110,589 customer end points. The average number of customer endpoints per transformer is four (31,371/110589 = 4).

As noted a meter reader reads on average 160 meters per day. The $50-150$ sites quoted in the response to CEC IR No. 1 Q22.1.2 relates to the range (urban versus rural) in the number of customers that can be targeted for analysis at a given time.
7.4 Please explain why the same theft analytics concepts as proposed under the AMI project cannot be implemented in a Status Quo scenario using the portable Meters on the transformation in an area; tagging the customer data by transformer in the customer system all meters downstream of each transformer; collecting the meter reads for the area downstream of a specific transformer on a single meter read day; reading the transformer meter on the same day; and comparing the results over a period of 1-3 months.

## Response:

A manual approach to energy balancing is not more effective by attempting to apply it at a more granular level. The following concerns highlight the difficulties of this proposal:

- This method is possible only in a geographically constrained area in which all the meters are scheduled to be manually read on the same day. This limits the number of areas that can be studied, or increases the costs in order to deploy transformer metering more widely. Also, since substation and feeder meter balancing data is not available, the transformer meters cannot be placed in the areas with the highest losses.
- The availability of only day-synchronized (rather than the time-synchronized meter readings available with AMI) between transformer and customer meters as suggested in the question means that a longer time period (such as the 1-3 months suggested in the question) is required before theft can be accurately identified. As a result coverage of the service area will be significantly reduced below that contemplated under AMI.
- The use of meter readers attempting to provide synchronized readings will disrupt the normally scheduled activities for this group resulting in missed regular reads, overtime or increased staffing with the associated operational impacts.
- The lack of remotely-readable customer meters means that customer premises must be accessed to accurately identify the source of the theft which was identified at the transformer level. This access is not required with AMI. The unexpected presence of FortisBC personnel at high risk theft sites outside of regular reading schedules will increase safety risks for these employees.
- Customers are more likely to be alerted by the unexpected presence of utility employees and will be motivated to temporarily modify their behaviour to avoid detection. Please also see the response to BCUC IR No. 2 Q7.1.

AMI allows FortisBC to more economically focus theft detection efforts in areas that are experiencing unexpectedly high losses by using substation and feeder readings that are time-synchronized with all downstream meters which is the most effective approach to energy balancing.

### 8.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.55.3

## Non-Project Capital

"The Measurement Canada compliance capital line item refers to the cost to replace FortisBC's electro-mechanical and small-batch digital meter fleet, based on an accelerated end of life resulting from the new Measurement Canada SS-06 regulations. These numbers do not include the cost of the compliance sampling activities. The costs in each year are directly correlated to the number of meters having their seals expire in a given year. The quantity of expirations in each year was estimated by a model that is described in the response to BCUC IR 1.5.1. In practice, it is possible that FortisBC would have applied to replace the meters more quickly than the model indicates if customers concerns arose about the accuracy of electromechanical meters.

More pronounced peaks are due to increased meter seal expirations in a given year due to large lot sizes or several large groups expiring together.
The following table outlines the predicted number of electro-mechanical and small-batch digital meter replacements between 2014 and 2034." [Ref: Exhibit B-6, BCUC IR 1.55.3, pp. 126-127]
8.1 Please explain why the table provided in the response to BCUC IR 1.55.3 is exactly the same as the table provided in the response to BCUC IR 1.5.1 for the years 2026 through 2031. Does this indicate there would be no small batch

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digital meters requiring replacement in that period, but there would be a large number of small batch digital meters to be replaced in 2032?

## Response:

FortisBC confirms that the reason the two referenced tables are the same from 2026-2031 is that there are no digital meter replacements expected in those years.

Further, FortisBC anticipates that there will be small batch digital meters needing replacement in 2032. These meter lots were not originally designated as small batches, but because each sampling has removed a large number of meters from the compliance group, the lots have decreased significantly in size.

### 9.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.58.1

Exhibit B-1-1, Excel Document: "FortisBC - AMI Excel NPV Analysis - 05Oct12"

New Operating Costs
9.1 Please explain why the labour costs drop $\$ 20$ thousand in 2019 as indicated in the table provided in the response to BCUC IR 1.58.1. Table BCUC IR 1.58.1.3 appears to indicate the business analyst salary begins decreasing in 2019.

## Response:

Table BCUC IR1 Q58.1.3 contained a cell error for the Business Analyst starting in 2017 which carried through to 2032. The corrected table is provided below:

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Table BCUC IR2 Q9.1

|  |  |  | 2021 |  | 2022 |  | 2023 |  | 2024 |  | 2025 |  | 2026 |  | 2027 |  | 2028 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | STAFF | S \$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Business Analyst | \$ | 171,492 | \$ | 174,579 | \$ | 177,721 | \$ | 180,920 | \$ | 184,177 | \$ | 187,492 | \$ | 190,867 | \$ | 194,303 |
|  | Technical Analyst | \$ | 200,810 | \$ | 204,425 | \$ | 208,105 | \$ | 211,851 | \$ | 215,664 | \$ | 219,546 | \$ | 223,498 | \$ | 227,521 |
|  | System Analyst | \$ | 187,423 | \$ | 190,797 | \$ | 194,231 | \$ | 197,727 | \$ | 201,286 | \$ | 204,909 | \$ | 208,598 | \$ | 212,353 |
|  | Customer Service Persons (Field Technicians) | \$ | 395,998 | \$ | 403,126 | \$ | 410,383 | \$ | 417,769 | \$ | 425,289 | \$ | 432,944 | \$ | 440,737 | \$ | 448,671 |
|  | Communications Technician | \$ | 133,874 | \$ | 136,283 | \$ | 138,736 | \$ | 141,234 | \$ | 143,776 | \$ | 146,364 | \$ | 148,998 | \$ | 151,680 |
|  | Telecom Engineer Resource | \$ | 97,537 | \$ | 99,292 | \$ | 101,080 | \$ | 102,899 | \$ | 104,751 | \$ | 106,637 | \$ | 108,556 | \$ | 110,510 |
|  | Revenue Protection Analyst | \$ | 267,747 | \$ | 272,567 | \$ | 277,473 | \$ | 282,467 | \$ | 287,552 | \$ | 292,728 | \$ | 297,997 | \$ | 303,361 |
|  | Total Staffing Costs | \$ | 1,058,883.40 | \$ | 1,077,943.30 | \$ | 1,097,346.28 | \$ | 1,117,098.51 | \$ | 1,137,206.28 | \$ | 1,157,676.00 | \$ | 1,178,514.17 | \$ | 1,199,727.42 |


|  |  |  | 2029 |  | 2030 |  | 2031 |  | 2032 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | STAFF | \$ |  |  |  |  |  |  |  |
|  | Business Analyst | \$ | 197,800 | \$ | 201,360 | \$ | 204,985 | \$ | 208,675 |
|  | Technical Analyst | \$ | 231,616 | \$ | 235,785 | \$ | 240,029 | \$ | 244,350 |
|  | System Analyst | \$ | 216,175 | \$ | 220,066 | \$ | 224,027 | \$ | 228,060 |
|  | Customer Service Persons (Field Technicians) | \$ | 456,747 | \$ | 464,968 | \$ | 473,338 | \$ | 481,858 |
|  | Communications Technician | \$ | 154,411 | \$ | 157,190 | \$ | 160,019 | \$ | 162,900 |
|  | Telecom Engineer Resource | \$ | 112,499 | \$ | 114,524 | \$ | 116,586 | \$ | 118,684 |
|  | Revenue Protection Analyst | \$ | 308,821 | \$ | 314,380 | \$ | 320,039 | \$ | 325,800 |
|  | Total Staffing Costs | \$ | 1,221,322.51 | \$ | 1,243,306.32 | \$ | 1,265,685.83 | \$ | 1,288,468.18 |

There is no material impact upon the proposed net customer benefit.

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|  | 2013 |  | 2014 |  | 2015 |  | 2016 |  | 2017 |  | 2018 |  | 2019 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| STAFF |  | - | \$ | 408 |  | \$ 951 | (\$000s) |  | \$ | 994 | \$ | 1,012 |  | \$ 992 |
| Total Staffing Costs | \$ |  |  |  |  |  | \$ | 969 |  |  |  |  |  |  |
| SOFTWARE LICENSING / SUPPORT COSTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Licensing Costs | \$ | - | \$ | 226 | \$ | 230 | \$ | 234 | \$ | 238 | \$ | 242 | \$ | 247 |
| WAN Technologies |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total WAN Costs | \$ | - | \$ | 242 | \$ | 246 | \$ | 251 | \$ | 255 | \$ | 260 | \$ | 265 |
| HARDWARE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Hardware Costs | \$ | - |  | \$0 |  | \$58 |  | \$58 |  | \$59 |  | \$60 |  | \$60 |
| OPERATIONAL COSTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Operational Costs | \$ | - | \$ | - | \$ | 44 | \$ | 45 | \$ | 45 | \$ | 46 | \$ | 47 |
|  | \$ | - | \$ | 875 | \$ | 1,529 | \$ | 1,556 | \$ | 1,591 | \$ | 1,620 | \$ | 1,611 |



## Response:

FortisBC concurs that the figures in the table presented in response to BCUC IR No. 1 Q58.1 are not the same as those shown on the Gross AMI tab of the NPV spreadsheet (Exhibit B-1-1). The difference appears to be 0.1 percent starting in 2015 , and increasing by approximately 0.1 percent each year thereafter, with an average difference of 0.7 percent over the life of the project. FortisBC is unable to explain the difference. The table is provided again, below, with correct figures as per Exhibit B-1-1.

Table BCUC IR2 Q9.2 - New Operating Costs



### 10.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.60.2

## New staffing - Business Analysts

"With the Itron system there are a variety of event types, including power loss/restore, tamper, tilt, low battery alarms, and voltage alarms, that would be handled by the two additional resources.

Itron does not have documentation detailing anticipated number of expected events and time to process/correct these events. These numbers will be dependent on many factors, notably FortisBC's decisions regarding configuration of events and alarms, automation of various processes, and the proficiency of the analysts. Configuration of the events and alarms and automation of various processes will be determined during the design phase of the project." [Ref: Exhibit B-6, BCUC IR 1.60.2, p. 146]
10.1 Please confirm, or otherwise explain, that the types of events described in the response to BCUC IR 1.60 .2 would indicate a very small number of actual events; power loss/restore would be the highest, but this will be part of an automated system installed for the PLTs; tamper, tilt, low battery and voltage would appear to be a very small number; of these, tamper and tilt would be theft items and handled by the Revenue Protection staff; and low battery and voltage events would be system maintenance/PLT related and handled by those staff.

## Response:

In all cases, except power loss/restore, events and alarms must be reviewed and assessed by the two business analysts prior to being distributed to other areas of the Company for additional action if required. This review/assessment process includes monitoring of a number of reports, work queues and dashboards that will facilitate informed decision-making, prior to assigning other staff for "action" activities.

### 11.0 Reference: Project Costs and Benefits

Exhibit B-1, BCUC IR 1.62.1
New staffing - System Analysts
11.1 Please explain why 2 new systems analysts would be required to support the AMI systems when there are only 2 systems analysts supporting the CIS. Note: The database administrators are separate from these positions.

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## Response:

The resourcing estimate to support the AMI systems is based on minimum requirements experienced by other utilities implementing similar size and type of advanced metering systems and FortisBC's resourcing experience.

### 12.0 Reference: Project Costs and Benefits <br> Exhibit B-6, BCUC IRs 1.1.63, 1.1.64 <br> New staffing - part-time Telecom Engineer <br> 12.1 Please confirm, or otherwise explain, that a Communications Technician troubleshoots, fixes, replaces and installs network devices and a Telecom Engineer plans, coordinates and optimizes the telecommunications field network of devices. Please advise if the engineer position is union exempt.

## Response:

FortisBC confirms the definitions for Communications Technician and Telecom Engineer as referenced in the question are accurate. For planning purposes, the engineer position was assumed to be union exempt.

### 13.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IR 1.66.1
Exhibit B-11, CEC IR 1.70.0, pp. 101-104 [pages 892-895 of 946 pages]
AMI 2012-11-08 Procedural Conference Transcript, p. 33
Probable integration of Kelowna - significance
" - Meter Growth and Replacement Sustaining Capital increases $\$ 0.655$ million, or 15\%;

- Total Sustaining Capital (including avoided Measurement Canada compliance costs) reduces $\$ 1.182$ million, or $45 \%$;
- Operating Expenses reduces $\$ 8.4$ million, or $\mathbf{2 0 \%}$. And
- $\quad$ Theft Reduction benefit increases $\$ 11.7$ million, or $\mathbf{1 2 . 5 \%}$.

In summary, the Company anticipates that the addition of the City of Kelowna improves the overall customer benefit to approximately $\$ 23$ million." [Ref: Exhibit B-11, CEC IR 1.70.1, p. 102] [emphasis added]
"I simply use this opportunity to flag, although it's not a significant issue in the sense of, it wouldn't have a significant impact on the AMI application, just for completeness, FortisBC will be submitting an application shortly to the Utilities Commission to acquire the city of Kelowna's electrical utility. And as part of that, or derived from that, FortisBC will be filing some additional written evidence that will show the impact of the AMI project if it occurred that both the AMI project and the city of Kelowna acquisition were approved. So it's not an issue that has a significant impact, but I just didn't want to pass by this without raising it as something that will be coming forward." [Ref: 2012-1108 Procedural Conference, p. 33] [emphasis added]
13.1 Please confirm, or otherwise explain, the probable integration of Kelowna into the AMI Project will increase the overall customer benefit by $\$ 5.8$ million, from a NPV of $\$ 17.6$ million to $\$ 23.4$ million.

## Response:

Confirmed.
13.2 Please explain what magnitude of change to the AMI project benefits NPV would be viewed by FortisBC as a significant change.

## Response:

The comments cited were intended in a qualitative sense. The potential City of Kelowna acquisition does not change the principles behind or analysis related to the AMI application, and does not raise new issues. The Acquisition requires only straightforward changes to the financial assumptions and calculations in the Application. The comments were not in reference to the quantitative scale of the impact on the customer benefit. FortisBC believes that the acquisition of the City of Kelowna utility will have a significant positive impact upon net customer benefits of the proposed AMI project.
13.3 Please confirm, or otherwise explain, the amounts in Table 4.1.a of Exhibit B-1-2 for meter growth and replacement, total sustaining capital and theft detection contain typographical errors and do not affect the integrity of the financial model presented in Exhibit B-1-3.

## Response:

Confirmed. Table 4.1.a of Exhibit B-1-2 contained minor typographical errors that do not affect the integrity of the financial model presented in Exhibit B-1-3. The numbers appearing in the response to CEC IR No. 1 Q70.1 are correct. The numbers in the Meter Growth and Replacement row should be positive, for a total (2013-2032) cost of $\$ 4.941$ million. The Total Capital row calculates as shown in the response to CEC IR No. 1 Q70.1.

### 14.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.91.1

Exhibit B-1, Section 5.1, pp. 90-91
Exhibit B-11, BCPSO IR 1.47.1

## Disconnect/reconnect

"The management of vacant premises can involve multiple vehicle trips to each identified vacant site. An initial trip is required to confirm vacant site status or to leave notification for the occupants of the requirement to contact the Company to establish an account. A second trip is often required to either disconnect the premises, or to leave another tag advising the occupant to contact the Company to avoid any interruption in service. The process is time consuming, labour intensive, and thus expensive, particularly as multiple vehicle trips are required before resolution occurs (1-2 for disconnect and 1 for reconnect)." [Ref: Exhibit B-1, p. 90]
"FortisBC assumed that a CSP will still require one visit to 50 percent of vacant premises and 100 percent of premises scheduled for disconnection due to non-payment." [Ref: Exhibit B-1, p. 91]
"Site visits will continue to be performed in advanced of disconnections in many cases (to assess the premise for risks and to hang a door tag), as referenced in the preamble to this question, so there will continue to be costs related to disconnections. Savings

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| Remote Disconnect/Reconnect | Dec-13 | Dec-14 | Dec-15 | Dec-16 | Dec-17 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Total Meters in Service [IR 48.3] | 116,410 | 118,734 | 121,059 | 123,293 | 125,502 |
| Meters Increase [calc] |  | 1.020 | 1.020 | 1.018 | 1.018 |
| Status Quo service calls [calc from 2013] | 7,935 | 8,093 | 8,252 | 8,404 | 8,555 |
| AMI service calls [IR 48.3] | 7,935 | 6,066 | 2,062 | 420 | 428 |
| Reduction by AMI [calc] | (0) | $(2,027)$ | $(6,190)$ | $(7,984)$ | $(8,127)$ |
| Reduction \% by AMI [calc] | 0\% | 25\% | 75\% | 95\% | 95\% |
| Vacant - Status Quo - visits [B-1, p. 90] | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Vacant - $60 \%$ of service calls [BPSCO 47.1] | 4,761 | 4,856 | 4,951 | 5,043 | 5,133 |
| ST Visits [calc] | 11,903 | 12,140 | 12,378 | 12,606 | 12,832 |
| Non-payment - Status Quo - visits [B-1, p. 90] | 3 | 3 | 3 | 3 | 3 |
| Non-payment - $40 \%$ of calls [calc] | 3,174 | 3,237 | 3,301 | 3,362 | 3,422 |
| ST Visits [calc] | 9,522 | 9,712 | 9,902 | 10,085 | 10,266 |
| Status Quo Total Visits [calc] | 21,425 | 21,852 | 22,280 | 22,691 | 23,098 |
| Vacant - AMI - visits [B-1, p. 91] | 5.0 | 4.5 | 1.1 | 1.0 | 1.0 |
| Vacant - 30\% of service calls [calc] | 2,381 | 2,428 | 2,476 | 2,521 | 2,566 |
| ST Visits [calc] | 11,903 | 10,926 | 2,723 | 2,521 | 2,566 |
| Non-payment - AMI - visits [B-1, p. 91] | 3 | 2.5 | 1.5 | 1 | 1 |
| Non-payment - $40 \%$ of calls [calc] | 3,174 | 3,237 | 3,301 | 3,362 | 3,422 |
| ST Visits [calc] | 9,522 | 8,093 | 4,951 | 3,362 | 3,422 |
| AMI Total Visits [calc] | 21,425 | 19,019 | 7,674 | 5,883 | 5,988 |
| Reduction in visits by AMI [calc] | 0\% | 13\% | 66\% | 74\% | 74\% |

14.1 Please explain how the savings related to the disconnection and reconnections under AMI can be roughly equal since there will be no service calls for the remote "reconnections".

## Response:

As discussed in the response to BCPSO IR No. 1 Q47.3, "CSPs are already budgeted and included in the Company's 2012 and 2013 revenue requirement. CSPs currently perform the bulk of the meter removals and exchanges, so it is expected that they will have spare capacity after the implementation of AMI to perform the required site visits. Therefore, the benefit shown in Table 5.3.3.a reflects the full avoided cost of all reconnects and disconnects."

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| :---: |

Therefore, because the total number of sites disconnected and reconnected will be roughly equivalent, and that all disconnection site visits will be performed by existing personnel with existing budgets outside the AMI financial analysis framework, the projected savings reflect the full avoided cost of all reconnects and disconnects.
14.2 Please confirm, or otherwise explain, that the reductions in site visits (service calls) will produce savings of $74 \%$ under the AMI scenario (not the $95 \%$ savings reported), and this will reduce the $\$ 13.267$ million savings to about $\$ 10.334$ million.

## Response:

As discussed in the responses to BCPSO IR No. 1 Q47.3 and BCUC IR No. 2 Q14.1, the number of site visits in AMI scenario for both vacant sites and non-payment sites would be zero in the above analysis. This is because the site visit required under AMI will be performed under an existing budget outside of the AMI financial analysis.

### 15.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.93.1

Exhibit B-1, Sec. 5.3.5, p. 94
Meter exchange costs post-AMI
"The AMI Project will result in the replacement of nearly all existing meters with new AMI enabled meters. This will avoid operating costs that would have been incurred sampling and retesting meters for six years after meter deployment. After year six, the cost of meter exchanges is expected to begin returning to the pre-AMI deployment levels." [Ref: Exhibit B-1, Sec 5.3.5, p. 94]

| Meter Exchanges | Dec-22 | Dec-23 | Dec-24 | Dec-25 | Dec-26 | Dec-27 | Dec-28 | Dec-29 | Dec-30 | Dec-31 | Dec-32 | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Status Quo exchanges [IR 1.5.1] | 409 | 803 | 259 | 136 | 172 | 271 | 61 | 26 | 43 | 29 | $62^{\text {r }}$ | 2,271 |
| Status Quo exchanges [IR 1.48.3] | 942 | 823 | 707 | 478 | 399 | 556 | 460 | 468 | 639 | 256 | 159 | 5,887 |
| AMI meters exchanged [IR 1.48.3] | 1,872 | 1,872 | 1,872 | 1,872 | 156 | 156 | 156 | 156 | 156 | 156 | 1,872 | 10,296 |
| Status Quo exchange cost [IR 1.48.3] | \$256 | \$239 | \$222 | \$183 | \$171 | \$204 | \$189 | \$194 | \$233 | \$157 | \$139 | \$2,186 |
| AMI excange cost [IR 1.48.3] | \$421 | \$429 | \$437 | \$444 | \$124 | \$127 | \$129 | \$131 | \$134 | \$136 | \$504 | \$3,015 |


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15.1 Please explain why the meter exchanges reported in BCUC IR 1.5.1 are significantly different from the Status Quo meter exchanges reported in BCUC IR 1.48.3.

## Response:

Please refer to the response to BCUC IR No. 2 Q1.5.
15.2 Please confirm, or otherwise explain, that the number, and cost, of meter exchanges in the 11 years of the AMI scenario, following the 6 (8?) year hiatus, is significantly higher than in the Status Quo scenario, and how this changes the AMI scenario.

## Response:

Historically, the number of meters sampled under the FortisBC compliance sampling program has been about 1,000 per year. For the Status Quo under the new SS-0-6 sampling regulations this is expected to increase by up to $50 \%$ for the first several years until the smaller compliance groups have been replaced with larger compliance groups.

The referenced table only contemplates the life of the existing meters and does not account for the future compliance sampling of new groups that are installed during the exchanges and replacements discussed in the Application. This serves to understate the Status Quo costs beginning in 2024, when the meters replaced in 2014 would be due for compliance sampling.

The table below includes the compliance sampling of these new meter groups beginning in 2024.

|  | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | Total |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Average |  |  |  |  |  |  |  |  |  |  |  |
| Status Quo Exchanges - <br> Including Replaced Meters | 942 | 823 | 752 | 642 | 802 | 683 | 1148 | 600 | 967 | 734 | 8093 |
| Predicted AMI exchanges | 1872 | 1872 | 1872 | 1872 | 156 | 156 | 156 | 156 | 156 | 156 | 8424 |

As shown in the table, the average number of meters sampled per year is expected to be slightly higher ( 842 vs 810 ) under the proposed AMI project than expected under the status quo. In both scenarios there are fewer meters being tested each year than have been tested historically due to the removal of the small compliance groups. For the calculation of the average the interval 2022 through 2031 was used to account for only one full seal period for the

AMI meters so as not to skew the average since the bulk replacement of all system meters requires the sampling to take place in short bursts. The interval referenced in the question (2022 through 2032) began at the start of one of these bursts and ended partway through another, therefore is not a good representation of the average.

Fortis $B C$ does not consider this small difference in the average number of meters being sampled under the AMI scenario versus the status quo to be significant, particularly considering the AMI financial analysis understated Status Quo costs as described above.

### 16.0 Reference: Project Alternatives Considered

Exhibit B-6, BCUC IR 1.105.1
Exhibit B-2, FortisBC 2008 AMI CPCN, Q17.3.5, p. 53
New Alternative - phased implementation of advanced meters
"Changes to National Policy (E-26), "Reverification Periods for Electricity Meters and Metering Installations", issued September 15, 2004 by Measurement Canada, will result in increased frequency of mechanical demand meter exchanges. The proposed regulation will require that 100 percent of mechanical demand meters be exchanged every four years."
[Ref: Exhibit B-2, FortisBC 2008 AMI, Q17.3.5, p.53]
16.1 Please explain what has changed from the time of the FortisBC 2008 AMI Application that has caused the replacement requirement for 100 percent of the electromechanical meters, under the Measurement Canada policy issued in 2004, to go from 4 years to 21 years.

## Response:

Measurement Canada introduced their new S-S-06 compliance sampling specification in February, 2010. The new specification was introduced with the understanding that it would replace LMB-EG-04 - Statistical Sampling Plans for the Re-verification of Electricity and Gas Meters which would be phased out by January 1, 2014. For clarity, the reference relating to 4 year required meter replacements (as per LMB-EG-04) from FortisBC's 2008 Application relates to the use of electromechanical thermal demand meters used to meter customers subject to demand billing, and does not include residential electromechanical meters.

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### 17.0 Reference: Project Alternatives Considered

## Exhibit B-6, BCUC IR 1.105.3

## New Alternative - phased implementation of advanced meters

"Results: NPV of net customer benefit becomes a cost of $\$ 10.830$ million."
[Ref: Exhibit B-6, BCUC IR 1.105.3, p. 245]
17.1 Please confirm, or otherwise explain, the NPV of the Status Quo with Kelowna integration is a cost of $\$ 7.089$ million compared to the scenario in BCUC IR 1.105.3 referenced above.

## Response:

To clarify, in the response to BCUC IR No. 1 Q105.3 the result was the net present value of the project costs and benefits to customers in the net AMI case (the difference between AMI and Status Quo), which is not comparable to the Gross Status Quo NPV.

FortisBC notes that the analysis provided in response to BCUC IR No. 1 Q105.3 inadvertently a) did not account for the cost to manually service those premises for which an economical WAN solution is not available, and b) double counted some meter capital costs in the Gross AMI tab. Correcting these (with all other variables/assumptions as per the original response), results in a total NPV of net customer cost of $\$ 3,077$ million (as opposed to the net cost of $\$ 10.830$ stated in the response to BCUC IR No. 1 Q105.3).

Using the phased implementation assumptions noted in the response to BCUC IR No. 1 Q105.3, with the addition of the City of Kelowna utility, the NPV of customer benefit becomes $\$ 3,850$ million (at an 8 percent discount rate).
17.2 Please provide a working spreadsheet with the project NPV for a scenario that changes the assumptions used in the response to BCUC IR 1.105.3 to have:
$>\quad$ inclusion of the Kelowna integration;
$>\quad$ labour costs increasing at 3\% per year, vehicle costs increasing at 5\% per year, and general inflation increasing at 2\% per year;
$>\quad$ depreciation of the AMI meters over 25 years instead of 20 years;

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$>$ the meter fleet converted to AMI meters:
i. $25 \%$ by 2016
ii. 50\% by 2019
i. $100 \%$ by 2024 (instead of only $75 \%$ );
$>\quad$ inclusion of the CIP benefit referenced in BCUC IR 1.16.2; and
$>\quad$ inclusion of a $\$ 4.9$ million cost in the Status Quo for the recovery of the 2008 and 2012 AMI application costs.

## Response:

With the assumptions provided in the question, the NPV of net customer benefit becomes $\$ 15,147$ million. Please refer to Electronic Attachment BCUC IR2 17.2.
17.3 Please provide the NPV of the scenario described immediately above with no theft related benefits in either the Status Quo with Kelowna or the phased AMI implementation with Kelowna.

## Response:

FortisBC is unclear whether the question requires the exclusion of theft related benefits for
a) the entire AMI system, inclusive of City of Kelowna, or
b) only for the City of Kelowna portion of the AMI system.

Therefore, the following provides answers for both scenarios.
a) With the exclusion of the theft reduction benefits in either the Status Quo or phased Net AMI scenarios (and keeping all other variables/assumptions from question BCUC IR No. 2 Q17.2 constant), the NPV of net customer benefit becomes a cost of $\$ 16,049$ million.
b) With the exclusion of only the City of Kelowna acquisition from the theft reduction benefits in either the Status Quo or phased Net AMI scenarios (and keeping all other variables/assumptions from question BCUC IR No. 2 Q17.2 constant), the NPV of net customer benefit becomes $\$ 12,143$ million.
17.4 Please advise if FortisBC would undertake, as a condition of approval of the AMI Application, to guarantee the impact to the Revenue Requirement of the minimum "Theft" benefits included in a final, approved base AMI scenario required to have a project NPV of zero.

## Response:

No, FortisBC would not guarantee minimum "Theft" benefits required to have a project NPV of zero. Aside from the concerns with providing guarantees for projects costs or benefits described in the response to BCUC IR No. 2 Q89.3 and Q89.3.1, FortisBC does not believe that the actual "Theft" benefit can be measured with precision.

### 18.0 Reference: Project Environment

## Exhibit B-6, BCUC IR 1.114.1

Use of another companies installed MDMS (Meter Data Management System)
18.1 Please confirm, or otherwise explain, that FortisBC would technically be able to utilize a MDMS installed at another company since the data from the AMI meters is collected using the internet.

## Response:

FortisBC confirms that it is possible to utilize a MDMS installed at another company since the AMI data can be transmitted to any location from a technical perspective. However, FortisBC does not believe that is an economic solution for the reasons outlined in the response to BCUC IR No. 1 Q114.1.
18.2 Assuming use of the MDMS of a company the size of BC Hydro, please explain the change in the AMI project with Kelowna NPV if the capital cost and depreciation related to the IT systems was only $6.5 \%$ of the amount included in the AMI with Kelowna scenario.

1

## Response:

FortisBC understands that the application of the $6.5 \%$ variation is directed solely at the MDMS, which is the only possible point of interface between the FortisBC and BC Hydro systems.

FortisBC will have to complete integration work between the MDMS, HES and existing Company systems, and given the added complexity of working with BC Hydro's MDMS, this integration work will be at least the equivalent of the current budget for these activities. FortisBC will also require that all security appliances and interfaces (including the HES) continue to reside within Company control.

The noted modification to costs results in a $\$ 0.9$ million improvement to the NPV to approximately $\$ 24.4$ million as a result of reduced software licensing fees (both initial and ongoing). FortisBC does not believe there would be any reduction in the amount of IT hardware required (there are only two servers required for the project).

### 19.0 Reference: Project Description

Exhibit B-6, BCUC IR 1.37.1
Itron Contract
"FortisBC has one procurement contract for the proposed AMI project, with Itron, dated March 19, 2012 for approximately $\$ 21$ million." [Exhibit B-6, BCUC IR 1.37.1]
19.1 Please provide a copy of the complete March 19, 2012 contract between FortisBC and Itron for the proposed AMI project.

## Response:

Due to contractual sensitivities, a copy of the complete March 19, 2012 contract between FortisBC and Itron for the proposed AMI project has been filed in confidence with the Commission.
19.1.1 If there is a separate contract between Itron and Fortis BC related to the disposal of the existing meters, please provide a complete copy of this contract.

## Response:

Disposal of the existing meters is included in the contract filed confidentially in response to BCUC IR No. 2 Q19.1.

### 20.0 Reference: Project Costs and Benefits

Exhibit B-1, Tab 4.0, Section 4.2.2, p. 55-56; Order G-50-10; Exhibit B-6, BCUC IR 1.37.1

Accounting Treatment of Existing Meters
"The AMI solution proposed by Itron will provide ... [for the] deployment of customer meters including removal and disposal of existing meters in an environmentally safe and efficient way." [Exhibit B-1, Tab 4.0, Section 4.2.2, p. 55]
"Meter disposal is included in the Itron-managed deployment activities. FortisBC will conduct random audits of the recycling / disposal process to ensure compliance with all applicable environmental regulations." [Exhibit B-1, Tab 4.0, Section 4.2.2, p. 56]
"FortisBC has one procurement contract for the proposed AMI project, with Itron, dated March 19, 2012 for approximately $\$ 21$ million." [Exhibit B-6, BCUC IR 1.37.1, p. 66]
The 2010 CPCN Guidelines outlined in Commission Order G-50-10 include the following Application Requirement:
"A schedule and supporting discussion comparing the project and feasible alternatives in terms of social and environmental factors, and the applicant's assessment regarding the overall social and environmental impact of the project relative to the overall impact of the feasible alternatives." [Appendix A to Order G-50-10, p. 6]
20.1 Please list the environmental regulations applicable to Itron's disposal of the existing meters.

## Response:

As part of the installation project, Itron provides disposal services that include recycling of all reusable materials and environmentally-sensitive disposal of any hazardous components.

Itron has not yet compiled the requisite exhaustive list of relevant regulations applicable to disposal of the existing meters. Itron, as FortisBC's prime contractor for the proposed AMI Project, will subcontract the disposal of meters to a qualified vendor who will be held
accountable to follow all local, provincial and federal regulations. Selection of the meter disposal subcontractor and compilation of the relevant regulations applicable for disposal of the existing meters will be completed during the Define/Design phase of the proposed AMI Project. For British Columbia, the applicable environmental regulations are prescribed in the Environmental Management Act Chapter 53 [SBC 2003].

For reference, GEEP (Global Electric Electronic Processing) manages FortisBC's existing meter disposals. Information on GEEP can be found at http://www.geepglobal.com/.
20.2 Please describe the process that will be undertaken by Itron in order to collect, remove and dispose of the existing meters "in an environmentally safe and efficient way" and specifically address whether the removal and disposal includes recycling, disposal and/or sale of the existing meters.

## Response:

Itron sorts the meters for scrap, salvage, or for return to the utility (as applicable, according to the contract established with the deployment vendor).

Upon receipt at the designated cross-dock facility (to be determined during the Define/Design phase of the proposed AMI Project), Itron pre-sorts meters for resale or scrap according to local and federal guidelines. Remaining materials are destroyed and disposed of in a manner compliant with applicable standards and regulations. Itron will provide a certificate of destruction to FortisBC as evidence to show meters have been destroyed.

The detailed process for this has not yet been finalized, and cannot be finalized until all relevant subcontractors are selected. Please see the response for BCUC IR No.2 20.1. The final recycling or disposal of materials process will be informed by the selected subcontractor and will be subject to current regulations, and dependent upon material prices, and other factors. Given these considerations, it is not possible to forecast exactly how all elements of existing meters will be processed at this time.

Following is an overview of Itron's generic process:
o Meters are removed from the field as new meters are installed. Existing meters may be placed into the same boxes used for shipping the new meters.
o When installers return to the cross-dock at the end of each work day, the removed meters are placed in a special and secure area of the cross-dock designated for disposal. Meters may be handled in a number of ways depending on the agreements made with installers and/or disposal vendors. Possibilities include:

- Boxed meters are palletized and prepared for pick-up by the disposal vendor
- Meters are removed to bins to be picked up by the disposal vendors
- Some initial component sorting may be take place at the cross-dock. For example, separating glass covers from the meters or removing old locking rings.
- Should specific meters be required for return to the utility (typically more valuable commercial and industrial meters), they would be sorted at this time.
- Meter Disposal Vendor will periodically remove the meters. Periodicity depends on deployment volumes.
- It will be up to the Meter Disposal Vendor to determine whether the disassembly process will take place locally or whether materials will be sent to an intermediate or final destination for destruction

The Meter Disposal Vendor is responsible for reconciling the number of meters provided by Itron and the number destroyed. Itron normally requires that all meters delivered to the disposal vendor be destroyed, however, questions regarding disposal, recycling and/or resale will be finalized during the Define/Design phase of the proposed AMI Project.
20.3 Please discuss the overall environmental impact of the removal and disposal of the existing meters under the proposed AMI project.

## Response:

FortisBC cannot accurately assess the "overall" environmental impact of the accelerated removal and disposal of the existing meters. This would require a full lifecycle analysis of the meters, including assessment of environmental impacts associated with all the stages of a

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meter's life from-cradle-to-grave (i.e., from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling).

However, given that the majority of the existing meters would in any case require replacement due to Measurement Canada guidelines, irrespective of the AMI project, the incremental environmental impact is likely to be small and only related to a delayed removal of the existing meters in the Status Quo.
20.3.1 In Fortis BC's opinion, is the environmental impact of disposing of the existing meters outweighed by the potential future conservation rate structures made possible with AMI implementation? Please discuss.

## Response:

It is possible that the environmental benefit of potential future conservation rate structures made possible with AMI implementation would outweigh the small incremental environmental impact of disposing or recycling the meters described in the response to BCUC IR No. 2 Q20.3.

### 21.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IRs 1.37.1, 1.39.1, 1.72.1-1.72.2

## Accounting Treatment of Existing Meters

"The existing meters are to be removed from service under the terms of the deployment contract for the smart meters. The Company assumed the cost of removal would be offset by any scrap value as they were disposed of." [Exhibit B-6, BCUC IR 1.72.1]
"The cost of disposal [of the existing meters] is included in the contracted deployment cost and has not been separately estimated." [Exhibit B-6, BCUC IR 1.72.2]
"Itron is required to apply any potential value from the digital meters against the cost of recycling / disposing of the meters [Exhibit B-6, BCUC IR 1.39.1]
"FortisBC has one procurement contract for the proposed AMI project, with Itron, dated March 19, 2012 for approximately $\$ 21$ million." [Exhibit B-6, BCUC IR 1. 37.1]

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21.1 Please estimate the total salvage value of the complete existing meter population to be disposed of under the proposed AMI project. Please provide the estimate on both a per unit basis and a total basis.

## Response:

The Company estimates the total salvage value to be between $\$ 0.73$ and $\$ 4.38$ per meter or between $\$ 80,000$ and $\$ 500,000$. The value varies considerably depending on the number and type of meters, packaging and freight.
21.2 Please estimate the total costs to remove and dispose of the complete existing meter population to be disposed of under the proposed AMI project.

## Response:

Please refer to the response to BCUC IR No. 2 Q21.4 for the costs of removal and disposal.
21.3 The Fortis BC response to BCUC IR 1.72.1 notes that Fortis BC has 'assumed' that the salvage value will be offset by the cost of removal. Please discuss the process undertaken and the specific information considered by Fortis BC in order to conclude that this is a sound assumption.

## Response:

The Company assumed that the cost of removal and disposal will be offset by the salvage value in order to eliminate another variable that is relatively low in cost or benefit. As noted in the response to BCUC IR No. 2 Q21.1 the salvage value can vary, but this does not influence the overall project economics.
21.4 The Fortis BC response to BCUC IR 1.72.2 notes that the "the cost of disposal is included in the contracted deployment cost and has not been separately estimated." Does this statement mean that the estimated cost of disposal is
included in the $\$ 21$ million Itron contract cost? If not confirmed, please explain otherwise. If confirmed, please provide the monetary value assigned to the cost of disposal in the Itron contract.

## Response:

Confirmed. The cost of removal and disposal is included in the Itron contract cost, and has not been separately estimated. The cost is expected to be similar to the salvage value identified in the response to BCUC IR No. 2 Q21.1.
21.4.1 Is the cost of disposal included in the Itron contract a fixed contract cost? If confirmed, please provide the amount. If not confirmed, please explain how the variable cost will be accounted for.

## Response:

The cost of removal and disposal is included in the meter deployment work that is to be subcontracted by Itron to a meter deployment subcontractor (in the Define/Design phase of the proposed AMI Project plan). The cost for this cannot be identified separately as it has not been separated out from the balance of the contract with Itron and is assumed to be equal to the recoveries from salvage.
21.5 Please confirm if the estimated salvage value of the existing meters is included as an offset to the $\$ 21$ million cost of the Itron contact. If not confirmed, please explain otherwise. If confirmed, please provide the monetary value assigned to the cost of disposal by Itron.

## Response:

The salvage value and removal and disposal costs are expected to approximately net to zero, and have not been separately estimated. Please refer to the response for BCUC IR No. 2 Q21.4.1.

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21.5.1 Is the salvage value included in the Itron contract a fixed amount? If confirmed, please provide the amount. If not confirmed, please explain how the variable cost will be accounted for.

## Response:

Please refer to the responses for BCUC IR No. 2 Q21.5 and Q21.4.1.
21.6 Does Fortis BC or Itron (or both) bear the responsibility of ensuring that an appropriate salvage value is received for the existing meters? Please explain.

## Response:

Both companies bear the responsibility for ensuring an appropriate salvage value is received for the existing meters. The mechanism is more fully described in the responses to CEC IR No. 1 Q45.5, Q45.5.1 and Q45.8.
21.6.1 In the event that the salvage value of the existing meters exceeds the removal and disposal costs, is Itron required to credit Fortis BC with the difference? Please discuss.

## Response:

Yes, any excess salvage value from the existing meters would be realized by FortisBC. The competitive deployment procurement process will include all costs and credits related to meter removal, disposal and salvage. Therefore, to the extent that the deployment bidders expect to receive excess value from the salvage of the meters, they are incented to pass those savings along in their bids. Since the deployment bidders are expected to provide fixed unit prices for deployment services, they are also expected to assume the risk of any changes in salvage value.

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21.6.2 In the event that the removal and disposal costs exceed the salvage value of the existing meters, is Fortis BC required to pay Itron the difference? Please discuss.

## Response:

Please refer to the response to BCUC IR No. 2 Q21.6.1.
21.7 Please discuss how Fortis BC plans on accounting for the disposal costs of the existing meters. Specifically, please discuss if such costs are will be treated as operating or capital costs, and provide an explanation as to why the accounting treatment was selected.

## Response:

FortisBC plans on treating the removal and disposal costs as a charge to accumulated depreciation in the same manner it treats all cost of removal. This is in accordance with the guidance provided by the BCUC Uniform System of Accounts prescribed for Electric Utilities.
21.8 Please discuss how Fortis BC plans on accounting for the salvage value of the existing meters. Specifically, please discuss if such costs are will be treated as operating or capital costs, and provide an explanation as to why the accounting treatment was selected.

## Response:

FortisBC plans on treating the salvage value as a credit to accumulated depreciation in the same manner it treats all salvage value. This is in accordance with the guidance provided by the BCUC Uniform System of Accounts prescribed for Electric Utilities.

### 22.0 Reference: Project Costs and Benefits

## Order G-50-10; "Regulated Utilities Manual: A Service for Regulated Utilities" ${ }^{1}$ <br> Revenue Requirement Impact

According to p. 7 of the "Regulated Utilities Manual: A Service for Regulated Utilities" published by Deloitte., the calculation of a utility's "revenue requirement" and the calculation of "customer rates" form two separate steps in the ratemaking process:
"Ratemaking ordinarily occurs in two steps: (1) the determination of total allowable revenues for the utility [the revenue requirement] and (2) the establishment of individual rates or rate schedules for various classifications of customers that will yield this amount. Individual rates are in theory based on an individual utility's specific cost of service, including cost allocations."

According to p. 8 of the "Regulated Utilities Manual: A Service for Regulated Utilities" published by Deloitte, the cost-of-service ratemaking methodology is one process used to determine the total allowable revenues for a utility. The cost-of-service ratemaking methodology is described as follows:
"[the] method [that] equates "revenue requirements" or "cost of service" with the total of: operating expenses, depreciation, taxes, and a rate-of-return allowance on the utility's investment in rate base."

Commission Order G-50-10 outlines the CPCN Application Guidelines for utilities filing for CPCN approval with the BCUC. Appendix A, Section 2 of Order G-50-10 outlines the CPCN "Application Requirements", including the following requirements to support the "Project Need, Alternatives and Justification":
"(iii) A schedule calculating the revenue requirements of the project and feasible alternatives, and the resulting impact on customer rates;
(iv) A schedule calculating the net present values of the incremental cost and benefit cash flows of the project and feasible alternatives, and justification of the length of the term and discount rate used for the calculation."

Exhibit B-1 of the 2012-2013 Revenue Requirement and Review of ISP proceeding notes the following in Tab 3, p. 11:
"System losses consist of:

1. Losses in the transmission and distribution system;

[^0]2. Company use;
3. Losses due to wheeling through the BC Hydro system; and
4. Unaccounted-for energy (meter inaccuracies and theft)

Losses are calculated by using a two year rolling average. The actual gross loss rate for 2012 is the average of the 2009 rate of 9.23 percent and the 2010 rate of 8.42 percent, which is 8.82 percent. The loss rate for 2013 is further reduced to 8.76 percent due to the AMI-based loss reduction program."

Commission Order G-112-12 concerning the 2012-2013 Revenue Requirements and Review of 2012 Integrated System Plan notes the following in directive 1.c.:
"The proposed Deferral Account for Power Purchase Expense variances from forecast is approved and is to be amortized in rates in 2014."
22.1 Does Fortis BC agree with the Deloitte manual quoted in the preamble to this IR that ratemaking occurs in two steps, including "(1) the determination of total allowable revenues for the utility [the revenue requirement] and (2) the establishment of individual rates or rate schedules for various classifications of customers that will yield this amount."? If Fortis does not agree, please discuss Fortis' alternative position on the ratemaking process.

## Response:

Agreed, however the Company notes that the cost allocations used to establish rates for specific customer classes is properly determined as part of a periodic cost of service analysis for all costs associated with providing service to customers, not annually subsequent to the determination of the annual revenue requirement (from which a general rate increase is applied equally to all customer classes).
22.1.1 Does Fortis BC agree that the following CPCN Application Requirement per Order G-50-10 is also a two-step process, given the distinction between the "revenue requirement" and "customer rates"? If not, please explain why not.
"(iii) A schedule calculating the revenue requirements of the project and feasible alternatives, and the resulting impact on customer rates;"

## Response:

Yes, FortisBC agrees.
22.2 Please confirm if Fortis BC agrees with the following definition of a "revenue requirement" provided by Deloitte:
"[the] method [that] equates "revenue requirements" or "cost of service" with the total of: operating expenses, depreciation, taxes, and a rate-of-return allowance on the utility's investment in rate base." ["Regulated Utilities Manual: A Service for Regulated Utilities", p. 8]
If not confirmed, please provide Fortis BC's opinion on what the appropriate definition of a revenue requirement should be.

## Response:

FortisBC confirms that the above definition appropriately describes a "revenue requirement". It should be noted that the revenue requirement of the utility (from an assessment of the base cost of service in a test year) can also be by set or affected by factors (productivity, O\&M) such as those used in performance-based ratemaking.

### 23.0 Reference: Project Costs and Benefits

Exhibit B-6-5, BCUC IR 1.97.2.1; Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction"

## Revenue Requirement Impact, Theft Benefit

"The Company submits that the forecast theft reduction benefits results in both a reduction of FortisBC's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
"The Company has not prepared the financial analysis of the AMI Project based on the impact of the theft reduction benefit on net billable load, but rather has treated the incremental revenue resulting from theft reduction as an offset to the revenue

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requirement, which produces a reasonable approximation of the impact to customer rates. For example, if it is assumed that revenue requirements were $\$ 327 \mathrm{M}$ and the net billable load were $3,100 \mathrm{GWh}$, the average rate would be approximately $\$ 105$ per MWh. If theft reduction increased the net billable load to $3,150 \mathrm{GWh}$ the same revenue requirement would yield a rate of $\$ 104$ per MWh (\$327M / 3,150 GWh). The AMI CPCN model assumes that the value of the theft reduction is $\$ 3.8 \mathrm{M}$ ( $50 \mathrm{GWh} * \$ 76$ per MWh), reducing the revenue requirement to $\$ 323.2 \mathrm{M}$ and resulting in the same average rate of $\$ 104$ ( $\$ 323.2 \mathrm{M} / 3,100 \mathrm{GWh}=\$ 104$ )." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
23.1 The Fortis BC revised response to BCUC IR 1.97.2.1 provides an example to demonstrate that the impact of the incremental net billable load expected from an increase in paying, illegal marijuana grow sites under the proposed AMI project on customer rates. Please confirm that the example provided by Fortis BC assumes an increase in net billable load from paying, illegal, marijuana grow sites of 50 GWh (i.e. $3,150 \mathrm{GWh}$ net billable load after theft reduction benefit versus $3,100 \mathrm{GWh}$ net billable load before theft reduction benefit).

## Response:

Confirmed.
23.2 Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction" calculates the theft reduction benefit of the proposed AMI project. The calculation includes the estimated number of illegal, paying marijuana grow sites under the proposed AMI project versus the Status Quo. Commission staff has used this information in order to calculate the incremental net billable load due to an increase in illegal, paying marijuana grow sites under the proposed AMI project, as estimated by Fortis BC. Please confirm that the calculation performed by Commission staff below is correct. If not confirmed, please provide a revised calculation in a working excel document and provide an explanation for each change made.


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## Response:

The Company confirms that the calculation performed by Commission staff is correct.
23.2.1 Please confirm that the "Estimated Incremental Billable from Illegal, Paying Marijuana Grow Sites (GWh's)" included in the calculation above is the incremental net billable load used by Fortis BC to calculate the theft reduction benefit of the proposed AMI project. If not confirmed, please explain otherwise.

## Response:

Not confirmed. The FortisBC financial analysis used changes in revenue based on changes in billable load calculated from changes in the number of marijuana production sites multiplied by the average load of a marijuana production site multiplied by the marginal revenue margin, as a proxy for changes in net billable load.

The net billable load used above was for illustrative purposes only and is representative of the Company's total net billable load for all customer classes.
23.2.2 Please discuss why an increase in net billable load of 50 GWh was used by Fortis $B C$ in the example calculation provided in the revised response to BCUC IR 1.97.2.1, as opposed to an estimated increase in net billable load based on data provided by Fortis BC in Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction".

## Response:

The 50 GWh increase in net billable load was used only to illustrate the point regarding the similar results obtained using two different models.

### 24.0 Reference: Project Costs and Benefits

Order G-50-10; Exhibit B-1, Tab 5.0, p. 84; Exhibit B-1-1, Excel Attachment, Tab "Net AMI"; Exhibit B-6, BCUC IR 1.97.2; Exhibit B-65, BCUC IR 1.97.2.1

Revenue Requirement Impact, Theft Benefit
The Fortis BC response to BCUC IR 1.97.2 confirms that Exhibit B-1-1 Excel Attachment Tab "Net AMI" Line 5.0 represents the "...the cumulative percentage decrease in the revenue requirement over 20 years, as opposed to a one percent reduction in rates."
"The Company submits that the forecast theft reduction benefits results in both a reduction of FortisBC's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]

Commission Order G-50-10 outlines the CPCN Application Guidelines for utilities filing for CPCN approval with the BCUC. Appendix A, Section 2 of Order G-50-10 outlines the CPCN "Application Requirements", including the following requirement to support the "Project Need, Alternatives and Justification":
"(iii) A schedule calculating the revenue requirements of the project and feasible alternatives, and the resulting impact on customer rates;
(iv) A schedule calculating the net present values of the incremental cost and benefit cash flows of the project and feasible alternatives, and justification of the length of the term and discount rate used for the calculation."
"It is expected that with an AMI-enabled theft detection program, marijuana grow operators may chose to switch to alternate energy sources rather than pay for electricity. This reduction in gross load is accounted for by assuming a 1 percent growth in grow sites in the probably AMI forecast as opposed to the 2 percent assumed in the status quo model." [Exhibit B-1, Tab 5.0, p. 84]
"... AMI enabled revenue protection is expected to increase theft detection from 8 to 25 percent by 2016, and gradually increase deterrence from 75 to 95 percent by 2021." [Exhibit B-1, Tab 5.0, p. 84]

Commission staff has prepared Schedule 1 (Part 1) in Appendix 1 (located on Attachment Panel) to BCUC IR 2 in order to demonstrate the revenue requirement impact of the proposed AMI project, using only the portion of the theft reduction benefit that impacts the revenue requirement i.e. excluding the portion of the theft reduction benefit related to an increase in net billable load. The Comments and Notes to Schedule 1 include explanations for any adjustments made by Commission staff to the analysis

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provided by Fortis in Exhibit B-1-1 Excel Attachment, Tab "Net AMI" and any calculations performed by Commission staff.

## Comment 1

The theft reduction benefit of the AMI project, as calculated by Fortis BC in Exhibit B-1-1 Excel Attachment Tab "Theft Reduction", has been removed from the revenue requirement impact calculation of the proposed AMI project, for the following reasons:

- Fortis BC submits that "The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response] As the increase in net billable load from paying, illegal marijuana grow sites does not impact the Company's revenue requirement, Commission staff has removed the theft benefit of the proposed AMI project, as calculated by Fortis BC, from the revenue requirement impact calculation.
- The Fortis BC response to BCUC IR 1.97.2 confirms that Exhibit B-1-1 Excel Attachment Tab "Net AMI" Line 5.0 represents the "...the cumulative percentage decrease in the revenue requirement over 20 years, as opposed to a one percent reduction in rates."


## Comment 2

The theft reduction benefit of the AMI project, as calculated by Fortis in Exhibit B-1-1 Excel Attachment Tab "Theft Reduction", assumes that the deterrence factor applied to the estimated total illegal, marijuana grow sites will increase to $95 \%$ by 2032 under the proposed AMI project, versus $70 \%$ under the Status Quo. Meaning, $95 \%$ of illegal, marijuana grow sites using electricity (as opposed to alternative energy sources) will pay for electricity under the proposed AMI project (as opposed to stealing electricity) versus only $70 \%$ for the Status Quo. Commission staff has included the incremental fixed bimonthly customer charge from the incremental paying, illegal marijuana grow sites under AMI as an offset to the revenue requirement impact calculation. Refer to the calculation performed by Commission staff in Note 1 of Schedule 1 in Appendix 1 to BCUC IR 2.

## Comment 3

In Exhibit B-1-1 Excel Attachment Tab "Theft Reduction", Fortis calculates the estimated revenue that will be collected from illegal marijuana grow sites under AMI versus the Status Quo. Fortis BC assumes that there will be more theft sites under the Status Quo option and therefore a higher number of theft sites identified by Fortis BC, resulting in a greater amount of revenue from identified theft sites collected under the Status Quo option versus the proposed AMI project. Commission staff has included this incremental revenue collected from identified theft sites under the Status Quo option in the revenue
requirement impact calculation. Refer to calculation performed by Commission staff in Note 2 of Schedule 1 in Appendix 1 to BCUC IR 2.

## Comment 4

The theft reduction benefit of the proposed AMI project, as calculated by Fortis in Exhibit B-1-1 Excel Attachment Tab "Theft Reduction", assumes that the total number of illegal, marijuana grow sites will increase annually by $1 \%$ under the proposed AMI project, versus $2 \%$ under the Status Quo. The revenue requirement impact of this assumption is that the smaller increase in the total number of illegal, marijuana grow sites will result in lower overall consumption and load and therefore lower power purchase costs under the proposed AMI project versus the Status Quo. The revenue requirement impact is calculated by Commission staff in Note 3 of Schedule 1 in Appendix 1 to BCUC IR 2.

## Comment 5

The Fortis BC response to BCUC IR 1.97.2 confirms that Exhibit B-1-1 Excel Attachment Tab "Net AMI" Line 5.0 represents the "...the cumulative percentage decrease in the revenue requirement over 20 years, as opposed to a one percent reduction in rates." For the reasons outlined in Comments 1-4 above, Commission staff has recalculated the revenue requirement impact of the proposed AMI project, excluding the theft reduction benefit related to an increase in net billable load from illegal, paying marijuana grow sites. Refer to calculation by Commission staff in Note 4 of Schedule 1 in Appendix 1 to BCUC IR 2.

Commission staff notes the following with respect to the Comments and Notes provided above:

- In this specific analysis, Commission staff has not assessed, nor have they supported, any assumptions made by Fortis BC in relation to the theft reduction benefit. The analysis is intended to demonstrate the mechanics by which Commission staff consider appropriate to calculate the theft reduction benefit of the AMI project on the revenue requirement over twenty years, using the assumptions made by Fortis in Exhibit B-1-1 Excel Attachment Tab "Theft Reduction".
- In this specific analysis, Commission staff has not assessed, nor have they supported, any other calculations or assumptions made by Fortis BC in calculating the revenue requirement impact of the AMI project in Exhibit B-1-1 Excel Attachment Tab "Net AMI" Line No. 5.
24.1 Please confirm that Comment 1 made by Commission staff above is accurate, or explain otherwise.


## Response:

With respect to the first bullet point in Comment 1 :
The Company agrees with the adjustments the Commission staff made in preparing Schedule 1 in Appendix 1 to BCUC IR2. The model correctly calculates the impact on rates based on certain load and load growth assumptions.

However, as FortisBC explained in response to BCUC IR No. 1 Q97.2.1 Revised Response (to Exhibit B-6-5)


#### Abstract

"Although revenue requirements do not in fact change as a result of theft reduction (aside from the reduction in power purchase expense related to deterrence as previously discussed), there clearly is a benefit associated with the impact of theft reduction resulting from AMI, which customers will see as a reduction in the average rate for electricity due to an increase in net billable load. FortisBC believes the financial analysis for the Project provided as part of the Application avoids adding undue complexity and variability not related to the Project, while still providing a reasonable approximation of the expected impact of the AMI Project to average customer rates."


To explain further, the Company could have calculated the benefit associated with the increase in net billable load by calculating average rates and thereby demonstrated that due to the increase in net billable load, revenue at prior year's rates increases in the subsequent test year and average customer rates would decrease. However, in order to do so, the Company would have to make assumptions on load growth and once load growth is introduced as a variable, the forecast benefit to average rates due to the AMI project could no longer to be examined in isolation from the impact of load growth on average rates. Any assumption regarding load growth would change average customer rates and thereby change relative rate increases (decreases).

By presenting the benefit to rates as a reduction in revenue requirements, the Company presented the theft reduction benefits in isolation of the impact of load growth on average customer rates.

The Company also notes that the results of both the FortisBC model and the Commission Staff model produce very similar results as illustrated below. The difference is attributable to the load growth in the Commission Staff model that will reduce the impact of revenue requirement changes on rates.

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| :---: | :---: | :---: | :---: | :---: | :---: |
| Forecast \% Impact on Revenue Requirement - FBC Model | (0.12\%) | 1.58\% | 1.56\% | (0.23\%) | (0.32\%) |
| Forecast \% Impact on Rates - Commission Staff Model | (0.10\%) | 1.65\% | 1.49\% | (0.28\%) | (0.30\%) |
| Difference between FBC and Commission Staff Models | (0.03\%) | (0.07\%) | 0.07\% | 0.05\% | (0.02\%) |
|  | Dec-18 | Dec-19 | Dec-20 | Dec-21 | Dec-22 |
| Forecast \% Impact on Revenue Requirement - FBC Model | (0.50\%) | (0.58\%) | (0.69\%) | (0.77\%) | (0.72\%) |
| Forecast \% Impact on Rates - Commission Staff Model | (0.43\%) | (0.47\%) | (0.54\%) | (0.60\%) | (0.54\%) |
| Difference between FBC and Commission Staff Models | (0.07\%) | (0.11\%) | (0.15\%) | (0.17\%) | (0.18\%) |
|  | Dec-23 | Dec-24 | Dec-25 | Dec-26 | Dec-27 |
| Forecast \% Impact on Revenue Requirement - FBC Model | (0.78\%) | (0.82\%) | (0.86\%) | (1.00\%) | (1.05\%) |
| Forecast \% Impact on Rates - Commission Staff Model | (0.59\%) | (0.61\%) | (0.64\%) | (0.78\%) | (0.81\%) |
| Difference between FBC and Commission Staff Models | (0.19\%) | (0.21\%) | (0.22\%) | (0.22\%) | (0.24\%) |
|  | Dec-28 | Dec-29 | Dec-30 | Dec-31 | Dec-32 |
| Forecast \% Impact on Revenue Requirement - FBC Model | (1.08\%) | (1.16\%) | (0.90\%) | (0.90\%) | (1.02\%) |
| Forecast \% Impact on Rates - Commission Staff Model | (0.83\%) | (0.91\%) | (0.64\%) | (0.63\%) | (0.75\%) |
| Difference between FBC and Commission Staff Models | (0.25\%) | (0.26\%) | (0.27\%) | (0.27\%) | (0.27\%) |

With respect to the second bullet point in Comment 1:
The Company assumes that the comment is with reference to Exhibit B-6 BCUC IR1 Q97.1. Assuming that is correct, then the Commission staff comment is accurate.
24.2 Please confirm that Comment 2 made by Commission staff above is accurate, or explain otherwise.

## Response:

Comment 2 made by the Commission staff is accurate.
24.3 Please confirm that the calculation provided in Note 1 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct. If not confirmed, please provide an updated calculation and give a detailed rationale for each individual adjustment made by Fortis BC.

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## Response:

Confirmed.
24.4 Please confirm that Comment 3 made by Commission staff above is accurate, or explain otherwise.

## Response:

Confirmed. Comment 3 made by Commission staff above is accurate.
24.5 Please confirm that the calculation provided in Note 2 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct. If not confirmed, please provide an updated calculation and give a detailed rationale for each individual adjustment made by Fortis BC.

## Response:

Confirmed. The calculation provided in Note 2 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct.
24.6 Please confirm that Comment 3 made by Commission staff above is accurate, or explain otherwise.

## Response:

Confirmed. Please also refer to the response to BCUC IR No. 2 Q24.4.
24.7 Please confirm that the calculation provided in Note 3 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct. If not confirmed, please provide an updated

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calculation and give a detailed rationale for each individual adjustment made by Fortis BC.

## Response:

Confirmed. The calculation provided in Note 3 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct.
24.8 Please confirm that the calculation provided in Note 4 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct. If not confirmed, please provide an updated calculation and give a detailed rationale for each individual adjustment made by Fortis BC.

## Response:

Confirmed. The calculation provided in Note 4 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct.
24.8.1 Specifically, please confirm that the NPV of the theft reduction benefit of the proposed AMI project on the revenue requirement over twenty years of $\$ 9,857$ thousand is correct. If not confirmed please provide an updated calculation in a working excel document and give a detailed rational for each change made.

## Response:

Confirmed. The NPV of the theft reduction benefit of the proposed AMI project on the revenue requirement over twenty years of $\$ 9,857$ thousand is correct.
24.8.2 Specifically, please confirm that the NPV of the revenue requirement increase resulting from the proposed AMI project over twenty years of $\$ 10,900$ thousand is correct. If not confirmed please provide an
updated calculation in a working excel document and give a detailed rational for each change made.

## Response:

Confirmed. The NPV of the revenue requirement increase resulting from the proposed AMI project over twenty years of $\$ 10,900$ thousand is correct.
24.9 Does Fortis BC agree that the calculation provided in Note 4 of Schedule 1 in Appendix 1 to BCUC IR 2 demonstrates the appropriate mechanics by which to calculate the revenue requirement impact only (i.e. excluding the customer rates impact of changes to billable load) of the of the proposed AMI project? If not confirmed, please provide a detailed explanation as to why Fortis BC disagrees and propose what Fortis BC considers to be the appropriate mechanics.

## Response:

FortisBC agrees that the calculation provided in Note 4 of Schedule 1 in Appendix 1 to BCUC IR 2 demonstrates the appropriate mechanics by which to calculate the revenue requirement impact only (i.e. excluding the customer rates impact of changes to billable load) of the proposed AMI project.

### 25.0 Reference: Project Costs and Benefits

Order G-50-10; Exhibit B-1, Tab 5.0, p. 82-84; Exhibit B-1-1, Excel
Attachment, Tab "Net AMI"; Exhibit B-6, BCUC IRs 1.97.2, 1.118.1.1;
Exhibit B-6-5, BCUC IR 1.97.2.1

## Customer Rates Impact, Theft Benefit

The Fortis BC response to BCUC IR 1.97.2 confirms that Exhibit B-1-1 Excel Attachment Tab "Net AMI" Line 5.0 represents the "...the cumulative percentage decrease in the revenue requirement over 20 years, as opposed to a one percent reduction in rates."
"The Company submits that the forecast theft reduction benefits results in both a reduction of Fortis $B C$ 's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related

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to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
"The Company has not prepared the financial analysis of the AMI Project based on the impact of the theft reduction benefit on net billable load, but rather has treated the incremental revenue resulting from theft reduction as an offset to the revenue requirement, which produces a reasonable approximation of the impact to customer rates." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
"FortisBC believes the financial analysis for the Project provided as part of the Application avoids adding undue complexity and variability not related to the Project, while still providing a reasonable approximation of the expected impact of the AMI Project to average customer rates." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
Commission Order G-50-10 outlines the CPCN Application Guidelines for utilities filing for CPCN approval with the BCUC. Appendix A, Section 2 of Order G-50-10 outlines the CPCN "Application Requirements", including the following to support the "Project Need, Alternatives and Justification":
"(iii) A schedule calculating the revenue requirements of the project and feasible alternatives, and the resulting impact on customer rates;
(iv) A schedule calculating the net present values of the incremental cost and benefit cash flows of the project and feasible alternatives, and justification of the length of the term and discount rate used for the calculation."

Commission staff has prepared Schedule 1 (Part 2) in Appendix 1 to BCUC IR 2 in order to demonstrate the customer rates impact of the proposed AMI project. The Comments and Notes to the schedule include explanations for any adjustments made by Commission staff to the analysis provided by Fortis BC in Exhibit B-1-1 Excel Attachment, Tab "Net AMI" and any calculations performed by Commission staff.

## Comment 1.2

The forecast sales volume for Fortis BC is taken directly from the 2012-2013 Revenue Requirement Application (Exhibit B-1, Appendix 3A - Long-Term Energy Forecast After DSM (Net Load)) The net load, as opposed to gross load, is considered appropriate as losses should be excluded from billable load / sales volume.

Fortis states the following in the response to BCUC IR 1.118.1.1:
"Consistent with all capital expenditures undertaken by the utility, the costs and benefits are included in the Company's Revenue Requirements and therefore are incorporated into all customer rates. In addition, the proposed FortisBC AMI project results in a net
benefit to all customers as is evidenced by the financial analysis included as part of this Application." [Exhibit B-6, p. 287]

Based on the comments provided by Fortis BC in the response to BCUC IR 1.118.1.1, Commission staff considers it appropriate for the purposes of this analysis to use the net load for all customer classes (i.e. Residential, Commercial, Wholesale, industrial, Lighting and Irrigation).

## Comment 2.2

For the purposes of this analysis, Commission staff has used the average cost per kWh of billable load in order to demonstrate the impact of the proposed AMI project on customer rates. Commission staff considers this appropriate for the purposes of this analysis for several reasons:

- Fortis BC submits that their analysis provides "...a reasonable approximation of the expected impact of the AMI Project to average customer rates." Considering this, Commission staff also consider it appropriate to use average cost per kWh of billable load in order to demonstrate the impact on the forecast increase in net billable load from illegal, paying marijuana grow sites on customer rates.
- Fortis BC submits that "The Company has not prepared the financial analysis of the AMI Project based on the impact of the theft reduction benefit on net billable load, but rather has treated the incremental revenue resulting from theft reduction as an offset to the revenue requirement, which produces a reasonable approximation of the impact to customer rates." Fortis BC also submits that "Although revenue requirements do not in fact change as a result of theft reduction (aside from the reduction in power purchase expense related to deterrence as previously discussed), there clearly is benefit associated the impact of theft reduction resulting from AMI, which customers will see as a reduction in the average rate for electricity due to an increase in net billable load." The incremental net billable load from illegal, paying marijuana grow sites does not impact the revenue requirement calculation. Commission staff therefore considers it more appropriate to demonstrate the impact of the incremental net billable load on customer rates by way of an analysis of the average cost per kWh of billable load.


## Comment 3.2

Fortis $B C$ submits that "Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
The theft reduction benefit of the AMI project, as calculated by Fortis in Exhibit B-1-1 Excel Attachment Tab "Theft Reduction", calculates the estimated number of paying

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illegal, marijuana grow sites under AMI versus the Status Quo. Fortis has also estimated the annual consumption per illegal, marijuana grow sites as follows:
"...FortisBC historical data indicates 30 lights per site. Although Fortis BC data indicates the number is trending upward, the more conservative 30 has been used in the theft benefit calculation. Each light consumes an average 14 kWhs per day based on a combination of 18 and 12 hour cycles which translates into $\mathbf{1 5 1 , 2 0 0} \mathbf{k W h s}$ annually per site." [Exhibit B-1, Tab 5.0, p. 82]
Commission staff has calculated the increase in net billable load resulting from an increase in paying, illegal marijuana grow sites under AMI versus the Status Quo in Note 5 of Schedule 1 in Appendix 1 to BCUC IR 2.

## Comment 4.2

The difference between the average cost per kWh of billable load with and without the incremental net billable load from illegal, paying marijuana grow sites, as calculated by Commission staff, demonstrates the impact on the average cost per kWh of billable load.

## Comment 5.2

The difference between the average cost per kWh of billable load without AMI and with AMI (i.e. including the revenue requirement impact of $A M I$ and the incremental net billable load from illegal, paying marijuana grow sites), multiplied by the forecast billable load, demonstrates the total benefit to customers over a twenty year period. Commission staff has calculated this benefit, based on Fortis BCs assumptions in Note 6 of Schedule 1 in Appendix 1 to BCUC IR 2.
Commission staff notes the following with respect to the Comments and Notes provided above:

- In this specific analysis, Commission staff has not assessed, nor have they supported, any assumptions made by Fortis BC in relation to the theft reduction benefit. The analysis is intended to demonstrate the mechanics by which Commission staff consider appropriate to calculate the theft reduction benefit of the AMI project on customer rates over twenty years, using the assumptions made by Fortis in Exhibit B-1-1 Excel Attachment Tab "Theft Reduction".
- In this specific analysis, Commission staff has not assessed, nor have they supported, any other calculations or assumptions made by Fortis in calculating the revenue requirement impact of the AMI project in Exhibit B-1-1 Excel Attachment Tab "Net AMI" Line No. 5.
25.1 Please confirm that Comment 1.2 made by Commission staff above is accurate, or explain otherwise.

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## Response:

Comment 1.2 made by Commission staff above is accurate.
25.2 Please confirm that Comment 2.2 made by Commission staff above is accurate, or explain otherwise.

## Response:

Confirmed. Comment 2.2 made by Commission staff above is accurate.
Please also refer to the response to BCUC IR No. 2 Q24.1.
25.3 Please confirm that Comment 3.2 made by Commission staff above is accurate, or explain otherwise.

## Response:

Comment 3.2 made by Commission staff above is accurate.
25.4 Please confirm that the calculation provided in Note 5 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct. If not confirmed, please provide an updated calculation and give a detailed rationale for each individual adjustment made by Fortis.

## Response:

Confirmed.

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25.5 Please confirm that Comment 4.2 made by Commission staff above is accurate, or explain otherwise.

## Response:

Comment 4.2 made by Commission staff above is accurate but fails to recognize the impact of load growth on average rates. Please also refer to the response to BCUC IR No. 2 Q24.1.
25.6 Please confirm that Comment 5.2 made by Commission staff above is accurate, or explain otherwise.

## Response:

Confirmed. Comment 5.2 made by Commission staff above is accurate.
Please also refer to the response to BCUC IR No. 2 Q24.1.
25.7 Please confirm that the calculation provided in Note 6 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct. If not confirmed, please provide an updated calculation and give a detailed rationale for each change made by Fortis BC.

## Response:

Confirmed. The calculation provided in Note 6 of Schedule 1 in Appendix 1 to BCUC IR 2 is correct.

### 26.0 Reference: Project Costs and Benefits <br> Exhibit B-6-5, BCUC IR 1.97.2.1 <br> Customer Rates Impact, Theft Benefit

"The Company submits that the forecast theft reduction benefits results in both a reduction of FortisBC's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
26.1 Please provide a break-even analysis to demonstrate the number of incremental units of net billable load that are required from illegal, paying marijuana grow sites in order for the proposed AMI project to result in lower customer rates. Please provide the calculation in a working excel document and provide a detailed listing of all assumptions used in the analysis.

## Response:

The Company estimates that an average of approximately 9.8 GWh of net billable load in each of the 20 study years, or about $83,000 \mathrm{KWh}$ per site would be required in order for the proposed AMI project to break even.

This estimate was determined by running a goal-seek on the Commission staff model included as the electronic Appendix 1 to Exhibit A-15 of the Commission Information Request No. 2. The average consumption per illegal paying marijuana grow sites in kWh was set to be a variable (Row 101). The goal-seek function was then run to calculate a zero NPV on the incremental impact of net billable load (Cell E94). All other assumptions remained the same.

An electronic copy of the analysis is provided as Electronic Attachment BCUC IR2 26.1.

### 27.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IR 1.86.1; Exhibit B-6-5 BCUC IR 1.97.2.1; Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction" Theft Reduction Benefit, Boyd Report

The response from BCUC IR 1.86.1 includes a report by Professor Neil Boyd. In the report, Boyd notes the following:
"I [Boyd] would say that the Plecas Report calculations of 90 days in the grow cycle and 4 grow cycles per year likely assume a degree of organization that does not exist with most grow operations - that is, most growers are unlikely to be so organized as to consistently generated this annual energy per light, dependent, as it is, upon continuing operations for 360 of 365 days in a calendar year...
... If we take a more conservative approach we might reset the equation for annual energy expended per light to $90 \times 14 \times 3=3,780 \mathrm{kWh}$. Accordingly, the annual use of energy for marijuana production in the area served by FortisBC is $[113,400] \mathrm{kWh}$ per site (3,780 x 30 lights)."
Fortis BC explains the calculation of the "Theft Reduction" benefit in the Revised Response to BCUC IR 1.97.2.1 as follows:
"The Company submits that the forecast theft reduction benefit results in both a reduction in Fortis BC's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5 BCUC IR 1.97.2.1]
27.1 Please comment on Boyd's estimate of $113,400 \mathrm{kWh}$ annual energy consumption per site, as opposed to the Fortis estimate of $151,200 \mathrm{kWh}$ annual energy consumption per site.

## Response:

Please refer to the response to BCUC IR No. 2 Q62.3.
27.2 In calculating the Theft Reduction benefit of the "higher net billable load" resulting from an increase in marijuana grow operations starting to pay for electricity rather than steal under the proposed AMI project, please confirm that Fortis BC used an estimated average annual consumption per site of $151,200 \mathrm{kWh}$. If not confirmed, please explain otherwise.

## Response:

Confirmed.
27.3 Commission staff has prepared an analysis of the impact of the proposed AMI project on both the revenue requirement and customer rates, using Boyd's estimate of $113,400 \mathrm{kWh}$ annual energy consumption per illegal, marijuana grow site. Please refer to calculation in Schedule 2 of Appendix 1 to BCUC IR 2. The calculations in Schedule 2 are consistent with those provided by Commission staff in Schedule 1, with the exception of the estimated annual energy consumption per illegal, marijuana grow site. Please confirm that the calculations are correct, based on an estimate of $113,400 \mathrm{kWh}$ annual energy consumption per illegal, marijuana grow site. If not confirmed, please provide an updated calculation in a working excel document, a listing of all assumptions used and a detailed explanation for each change made to the calculations performed by Commission staff.

## Response:

The calculation in Schedule 2 is correct however the 113,400 kWh estimated annual energy consumption per site is not supported by FortisBC. Please see the response to BUC IR No. 2 Q62.3.

### 28.0 Reference: Theft

Exhibit A2-1; Exhibit B-6-5, BCUC IR 1.97.2.1, p. 14
Theft Reduction, Diplock and Plecas Report
Exhibit A2-1 is a report by Jordan Diplock and Darryl Plecas entitled: "The Increasing Problem of Electrical Consumption in Indoor Marihuana Grow Operations in British Columbia." Page 2 of the report notes the following with respect to illegal marijuana grow operations that are not stealing electricity (i.e. they are paying for electricity):
"What must also be taken into account is the amount of electricity consumed by operators of marihuana growing operations not stealing electricity. This would include another 6,339 cases per year. Again, using the findings of Chaisson and Plecas (2011a) and Chaisson and Plecas (2011 b), each of these operations, on average, would use 21.8 lights or $109,872 \mathrm{kWh}$ of electricity per year. The annual consumption then, which is, in effect, wasted consumption, on account that it is put toward an illegal enterprise, is nearly 696.5 GWh . At $0.0627 / \mathrm{kWh}$, this equates to another $\$ 43.7$ million worth of
electricity per year. Priced out at the higher rate, the cost would actually be $\$ 61.2$ million. That said, BC Hydro would not peg the cost this high, as its investigators have estimated that the average growing operation not involving theft uses just 10 lights. BC Hydro's estimate would be particularly accurate in those locations that currently employ electrical and fire safety inspection (EFSI) initiatives, as growing operations with 10 or more lights would consume more electricity than the 93 kWh per day threshold for overconsumption, and would come to the attention of EFSI inspection teams, rather than BC Hydro's own inspectors. According to the BC Hydro estimates, at the higher rate (\$0.0878), we should expect their estimate to be substantially lower at $\$ 28.1$ million."

Fortis BC explains the calculation of the theft reduction benefit in the Revised Response to BCUC IR 1.97.2.1 as follows:
"The Company submits that the forecast theft reduction benefit results in both a reduction in Fortis BC's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5 BCUC IR 1.97.2.1, p. 14]
28.1 Please comment on Diplock and Plecas' estimate that operators of marihuana growing operations not stealing electricity (i.e. sites that pay for electricity) consume on average 109,872 kWh annually per site, as opposed to the Fortis BC estimate of 151,200 kWh annual energy site.

## Response:

FortisBC did not use the Diplock and Plecas estimate of 36 lights for marijiuana theft sites as Company internal data did not support this number. Similarly, the report estimate of 21.8 lights for paying sites is not supported by Company data. Please see the response to CEC IR No. 1 Q81.1.
28.1.1 Did Fortis BC consider calculating the Theft Reduction benefit resulting from an increase in net billable load from marijuana grow sites under the proposed AMI project using the Diplock and Plecas' estimate that operators of marihuana growing operations not stealing electricity (i.e. sites that pay for electricity) consume on average $109,872 \mathrm{kWh}$ annually per site? If confirmed, please discuss why this estimate was not considered appropriate.

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## Response:

Confirmed. The Company has limited visibility of the size of operations that pay for electricity. The data compiled to date in 2012 indicates an average of 53.8 lights for paying licensed sites shut down by the RCMP. In the absence of more concrete data the Company elected to use the more conservative estimate of 30 lights for paying operations. Please see the responses to BCUC IR No. 1 Q83.3 and CEC IR No. 1 Q81.1.
28.2 Commission staff has prepared an analysis of the impact of the proposed AMI project on the revenue requirement calculation and customer rates, using Diplock and Plecas' estimate of $109,872 \mathrm{kWh}$ annual energy consumption per paying illegal, marijuana grow site. Please refer to calculation in Schedule 3 of Appendix 1 to BCUC IR 2. The calculation is consistent with those provided by Commission staff in Schedule 1, with the exception of the estimated annual energy consumption per paying illegal, marijuana grow site. Please confirm that the calculation, based on an estimate of $109,872 \mathrm{kWh}$ annual energy consumption per paying illegal, marijuana grow site is correct. If not confirmed, please provide an updated calculation in a working excel document, a listing of all assumptions used and a detailed explanation for each change made to the calculation performed by Commission staff.

## Response:

The calculation in Schedule 3 is not consistent with the calculation in Schedule 1 as premised in the question. It is consistent with the calculation in Schedule 2 with the exception of the estimated annual energy consumption per paying illegal marijuana grow site.

If the intent was to model changes to Schedule 2 then the calculation is correct. If the intent was to model changes in Schedule 1 then line 52 of Schedule 3 will need to be changed to 151,400 annual kWhs per illegal marijuana theft grow site. The result will be a change in the Revenue Requirement under AMI (\$000) to $\$ 10,885$, and the NPV of the AMI Project Impact on Average Customer Rates (\$000) including Benefit to Illegal Paying Marijuana Grow Sites to $(3,592)$. Please see the updated excel file which reflects a comparison with Schedule 1 provided as Electronic Attachment BCUC IR 228.2

The 109,872 kWh estimated annual energy consumption per paying site is not supported by FortisBC. Please see the responses to BCUC IR No.2 Q28.1 and CEC IR No. 1 Q81.1.

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### 29.0 Reference: Project Costs and Benefits

Order G-50-10; Exhibit B-6-5, BCUC IR 1.96.1 Revised Response;
Exhibit B-1-1, Tab 5.0, Table 5.1.1.a, Updated p. 73]
Cost and Benefit Cash Flows
Commission Order G-50-10 outlines CPCN application guidelines. The CPCN "Application Requirements" per Order G-50-10 include the following item that must be provided to support "Project Need, Alternatives and Justification" (Section 2 of the Application Requirements):
(iv) A schedule calculating the net present values of the incremental cost and benefit cash flows of the project and feasible alternatives, and justification of the length of the term and discount rate used for the calculation;" [Appendix A to Order G-50-10, page 6 of 12]
29.1 Please confirm that the net present value of the incremental cost and benefit cash flows provided by Fortis BC in BCUC IR 1.96 .1 is a cash outflow of $\$ 8,884$ thousand.

## Response:

Confirmed.
29.1.1 Please confirm that the net present value of the incremental cost and benefit cash flows provided by Fortis BC in BCUC IR 1.96.1 excludes all CPCN development and regulatory costs. If the answer is yes, please explain why 100 percent of these costs have been excluded.

## Response:

Confirmed. FortisBC excluded all of the CPCN development and regulatory costs under the assumption that all "sunk" costs were to be excluded from the analysis.

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29.1.2 Please provide the net present value of the incremental cost and benefit cash flows of the proposed AMI project, including the CPCN development and regulatory costs associated with the 2012 Application of $\$ 4,640$ thousand (i.e. excluding the 2007 AMI application costs of $\$ 275$ thousand as sunk costs). [Exhibit B-1-1, Tab 5.0, Table 5.1.1.a, Updated p. 73]

## Response:

The net present value of the incremental cost and benefit cash flows of the proposed AMI project, including the CPCN development and regulatory costs associated with the 2012 Application of $\$ 4,640$ thousand is a net cost of $\$ 12,822$ thousand.
29.1.2.1 Please provide the net present value of the incremental cost and benefit cash flows each alternative (i.e. PLC and AMR), including the CPCN development and regulatory costs associated with the 2012 Application of $\$ 4,640$ thousand (i.e. excluding the 2007 AMI application costs of $\$ 275$ thousand as sunk costs). [Exhibit B-1-1, Tab 5.0, Table 5.1.1.a, Updated p. 73]

## Response:

Please see the table below (which show an NPV cost, not an NPV benefit).
Table BCUC IR2 Q29.1.2.1 - NPV of Incremental Cost and Benefit Cash Flows

|  | NPV of Net <br> Cash Flow at <br> 8 Percent <br> Discount Rate <br> $(\$ 000 s)$ |
| :--- | ---: |
| PLC | 27,007 |
| AMR | 2,368 |

### 30.0 Reference: Project Costs and Benefits

## Exhibit B-11, CEC IR 1.40.1, p. 53

Capital Costs
"It is difficult to predict whether RF systems will evolve by enhancing networking capabilities, reducing costs or both. However, the pace of change is likely to be higher with RF systems (including mesh) than it is with PLC or AMR technologies.

The difference in the pace of changes in the technologies is due to a higher level of investment in RF AMI installations than other technologies, and from the standardization of the mesh technologies." [Exhibit B-11, CEC IR 1.40.1, p. 53]
30.1 In the response to CEC IR 1.40.1, Fortis BC indicates that "...the pace of change is likely to be higher with RF systems (including mesh) than it is with PLC or AMR technologies." Please confirm if Fortis BC considered delaying the proposed AMI project in order to realize any benefits associated with the pace of technological change related to RF systems, and explain why or why not.

## Response:

Any benefits from a delay in the proposed AMI project, whether in terms of reduced cost or enhanced functionality, are difficult to predict and quantify. Since the 2007 AMI Application, the cost of the project has increased but the benefits are similar (aside from the recognition of theft reduction).

FortisBC believes that the AMI project should be implemented in accordance with the timelines proposed in this Application for the reasons articulated in the response to BCUC IR No. 1 Q2.1.

### 31.0 Reference: Project Costs and Benefits

## Exhibit B-11, CEC IR 1.44.2, p. 62

## Capital Costs, PLC Alternative

"While the business needs defined the needed functionality of the system, FortisBC's unique service territory was also important. Compared with other utilities, FortisBC has a significant proportion of long rural distribution feeders and a lower number of customers per feeder. This was expected to have an impact on which technologies might be proposed by respondents to the RFP. For example, some technologies such as PLC require equipment to be installed on each feeder and require additional
infrastructure to propagate the communications signal along a long feeder. For FortisBC, the costs to deploy this technology would likely not be as economical as it would be for other utilities." [Exhibit B-11, CEC IR 1.44.2, p. 62]
"FortisBC cannot definitively say why FortisAlberta received PLC system proposals. However two factors likely contributed: 1) PLC technology is best suited for utilities with low meter density per square kilometer, and 2) FortisAlberta required daily (rather than hourly) reads.
Lower meter density negatively impacts the economics of an RF mesh solution relative to a PLC solution since RF mesh technologies rely on meter-to-meter communication. FortisAlberta customer density is approximately 11.2 meters per square kilometre vs. FortisBC density of 38.6 meters per square kilometre." [Exhibit B-6, BCUC IR 1.113.1.2]
31.1 Fortis BC submits that "Lower meter density negatively impacts the economics of an RF mesh solution relative to a PLC solution since RF mesh technologies rely on meter-to-meter communication. " Please provide any reasons why PLC meters would not be suitable to high-density customer service areas.

## Response:

FortisBC did not indicate that PLC meters would be generally unsuitable for high-density customer service areas. The Company simply pointed out the relative economics of RF mesh and PLC solutions with respect to customer density.
31.2 In the response to CEC IR 1.44.2, Fortis BC submits that "Compared with other utilities, FortisBC has a significant proportion of long rural distribution feeders and a lower number of customers per feeder. This was expected to have an impact on which technologies might be proposed by respondents to the RFP. For example, some technologies such as PLC require equipment to be installed on each feeder and require additional infrastructure to propagate the communications signal along a long feeder. For FortisBC, the costs to deploy this technology would likely not be as economical as it would be for other utilities." Fortis BC also submits that "Lower meter density negatively impacts the economics of an RF mesh solution relative to a PLC solution since RF mesh technologies rely on meter-to-meter communication." Please discuss the operational and financial obstacles to deploying RF meters in areas with a low number of customers per feeder, given that the lower meter density "...negatively impacts the economics of an RF mesh solution relative to a PLC solution."

1

## Response:

FortisBC assumes that any operational or financial obstacles related to RF solutions in lowerdensity areas were less than those associated with PLC-only or RF-PLC-hybrid systems. If that were not the case, RFP responses would have included PLC-only or hybrid systems.

Please note that the customer density figures provided in the response to BCUC IR No. 1 Q113.1.2 were based on incorrect data from the Canadian Electricity Association. That data has since been corrected. The correct values are 2.3 meters per square kilometre for FortisAlberta and 6.4 meters per square kilometer for FortisBC. These corrected figures do not affect the original response.

### 32.0 Reference: Project Costs and Benefits

## Exhibit B-1, Tab 7.0, p. 112; Exhibit B-6, BCUC IRs 1.106.4-1.106.5 Responses

## Capital Costs, PLC Alternative

"As mentioned in Section 4.2.2, no PLC proposals were received from any vendors during the RFP process. However, Itron was able to provide an estimate of PLC capital costs of approximately $\$ 66$ million for a system with nearly equivalent functionality to their RF technology." [Exhibit B-1, Tab 7.0, p. 112]

In the response to BCUC IR 1.106.4, FortisBC notes that "... the [Itron PLC] estimate was provided to Fortis BC has a written estimate."

The FortisBC response to BCUC IR 1.106.3 notes the following:
"Itron provided a written estimate for a 100\% OpenWay PLC solution. The Itron OpenWay system upon which the proposed AMI system is based is designed to consist primarily of RF equipped meters. Alternative meter communications options include direct-cellular and PLC equipped meters to address situations that cannot economically be accommodated by RF. PLC equipped OpenWay meters are currently not commercially available from Itron, but are expected to provide similar capabilities to the RF and cellular-equipped meters. These enhanced capabilities require a more expensive PLC infrastructure than typical PLC-equipped meters generally available on the market."
32.1 Please provide a copy of the written estimate of the PLC capital costs of $\$ 66$ million provided to Fortis BC by Itron.

1

## Response:

A copy of the written estimate of the PLC capital costs provided to FortisBC by Itron has been filed in confidence with the Commission.

Please note that this estimate is for Itron equipment and services only and does not include all components required for a complete AMI system as discussed in BCUC IR No. 2 Q33.1 and BCUC IR No. 2 Q33.1.1.
32.2 Fortis BC notes in the response to BCUC IR 1.106.3 that "...PLC equipped OpenWay meters are currently not commercially available from Itron." Does Itron currently manufacture PLC equipped meters?

## Response:

At this time, Itron does not currently manufacture PLC meters that are suitable for use in North America due to the relatively small market size, although it does manufacture PLC meters for other markets.

## Response:

FortisBC used the Itron PLC meters as a comparison because they are expected to provide very similar capabilities to the RF mesh OpenWay system. This preserves the benefits of the AMI system. Itron had proposed its PLC system early in the RFP process as a possible way of communicating with "hard-to-reach meters" (although it indicated that such a product was not currently available due to lower North American demand).

FortisBC also evaluated the FortisAlberta PLC system as a comparison (see below), but did not use the cost of that system for the PLC alternative due to its different functional capabilities as compared to the proposed AMI solution.

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FortisBC chose to use these two sources (Itron and FortisAlberta) since FortisBC values the candid opinions each party has provided to FortisBC throughout the development of the AMI Application. Using Itron and FortisAlberta to provide cost and functionality estimates for the PLC alternative analysis was also more cost effective than incurring the expense of issuing a new "PLC-only" RFP.

Using cost information from FortisAlberta, FortisBC prepared an estimate based on the PLC system implemented there. The cost of implementing that system is approximately $\$ 55$ million (with PLC-specific hardware costs not increased for inflation since the FortisAlberta system was procured). The estimate assumes the following:

- The same IT costs as the proposed AMI system (FortisAlberta did not procure IT systems)
- The same deployment costs as the proposed AMI system
- No inflation from the 2006 contracted FortisAlberta pricing
- No remote disconnect switches (FortisAlberta did not procure remote disconnect switches)

This system would not provide the following functions as compared to the proposed AMI system:

- Limited hourly reads
- No remote connect/disconnect
- No HAN capability

Therefore the following benefits would be reduced or eliminated:

- Theft detection (it is not clear what PLC feeder metering is available or at what cost, nor what the impact of daily vs hourly readings is on energy balancing)
- Remote connect/disconnect
- Future HAN benefits

None of the above limitations are assumed with the Itron PLC solution.

### 33.0 Reference: Project Costs and Benefits

Exhibit B-1, Tab 7.0, p. 112; Exhibit B-1, Tab 5.0, p. 70, Table 5.1.a;

Exhibit B-6, BCUC IRs 1.106.4-1.106.5 Responses
Capital Costs, PLC Alternative
"As mentioned in Section 4.2.2, no PLC proposals were received from any vendors during the RFP process. However, Itron was able to provide an estimate of PLC capital costs of approximately $\$ 66$ million for a system with nearly equivalent functionality to their RF technology." [Exhibit B-1, Tab 7.0, p. 112]

The response to BCUC IR 1.106.3 notes the following:
"Itron provided a written estimate for a 100\% OpenWay PLC solution. The Itron OpenWay system upon which the proposed AMI system is based is designed to consist primarily of RF equipped meters. Alternative meter communications options include direct-cellular and PLC equipped meters to address situations that cannot economically be accommodated by RF. PLC equipped OpenWay meters are currently not commercially available from Itron, but are expected to provide similar capabilities to the RF and cellular-equipped meters. These enhanced capabilities require a more expensive PLC infrastructure than typical PLC-equipped meters generally available on the market.

| Line Item | Difference Between <br> PLC and RF (positive <br> numbers indicate higher <br> PLC cost) (\$000s) |
| :--- | ---: |
| Meters | $\$ 4,861$ |
| Network Infrastructure and <br> Installation | $\$ 16,258$ |
| Head End System | $\$ 216$ |
| Security Appliances | $\$ 0$ |
| Professional Services | $\$ 698$ |
| Total | $\mathbf{\$ 2 2 , 0 0 0}$ |

33.1 Does the table prepared by Fortis BC in the response to BCUC IR 1.106.3 compare the total AMI project capital costs of $\$ 47,689$ thousand to the Itron estimate of the PLC capital costs of $\$ 66$ million?

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## Response:

The table prepared by FortisBC in response to BCUC IR No. 1 Q106.3 compares the cost of Itron provided equipment and services for the proposed RF AMI and the alternative PLC systems. It does not compare costs for theft detection equipment, IT infrastructure, WAN infrastructure or internal FortisBC expenditures such as Project Management and CPCN development and regulatory costs.
33.1.1 If not confirmed, please list each individual line item that was added / deducted from the PLC capital costs of $\$ 66$ million for the purposes of preparing the table in BCUC IR 1.106.3. Please also explain why each line item was added / deducted.

## Response:

Please see the response to BCUC IR No. 2 Q33.1. The table referenced in the question was a comparison of the vendor and equipment costs associated with the proposed RF AMI solution and a PLC alternative, not a comparison of the total costs of the systems. A comparison of the total capital costs of the proposed RF AMI solution and the Itron PLC alternative is provided in the response to BCUC IR No. 2 Q34.2.
33.1.2 If not confirmed, please list each individual line item that was added / deducted from the PLC capital costs of $\$ 66$ million for the purposes of preparing the table in BCUC IR 1.106.3. Please also explain why each line item was added / deducted.

## Response:

FortisBC notes that this question is a duplicate of BCUC IR No. 2 Q33.1.1 above. Please refer to the response to BCUC IR No. 2 Q33.1.1.
33.2 Please complete Column $B$ and $C$ of the table below. Column $C$ less Column $B$ should equal Column A. Column A should agree to the table provided by Fortis

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|  | Difference between <br> PLC and RF <br> (positive numbers <br> indicate higher PLC <br> cost) | AMI Project <br> Capital <br> Costs | PLC <br> Project <br> Capital <br> Costs |
| :--- | ---: | ---: | ---: |
|  | $(\$ 000 \mathrm{~s})$ |  |  |
| Meters | $\$ 4,861$ | $\$ 11,438$ | $\$ 16,299$ |
| Network Infrastructure and Installation | $\$ 16,258$ | $\$ 1,448$ | $\$ 17,706$ |
| Head End System | $\$ 216$ | $\$ 585$ | $\$ 801$ |
| Security Appliances | - | $\$ 204$ | $\$ 204$ |
| Professional Services | $\$ 698$ | $\$ 2,793$ | $\$ 3,491$ |
| Total | $\$ 22,033$ | $\$ 16,468$ | $\$ 38,501$ |


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### 34.0 Reference: Project Costs and Benefits

Exhibit B-1, Tab 7.0, p.112; Exhibit B-1, Tab 5.0, p. 70, Table 5.1.a;

Exhibit B-6, BCUC IRs 1.106.4-1.106.5 Responses
Capital Costs, PLC Alternative
"As mentioned in Section 4.2.2, no PLC proposals were received from any vendors during the RFP process. However, Itron was able to provide an estimate of PLC capital costs of approximately $\$ 66$ million for a system with nearly equivalent functionality to their RF technology." [Exhibit B-1, Tab 7.0, p. 112]
34.1 Does the Itron estimate of the PLC capital costs of $\$ 66$ million include all of the following cost categories? For any cost categories listed above that are excluded from the Itron estimate of the PLC capital costs of $\$ 66$ million, please list the cost categories that is excluded.
o Third party software and services
o Meters (including deployment)
o Network infrastructure
o System integration
o Theft detection
o Project management
o CPCN development / Approval costs
o Capitalized overhead, AFUDC, PST

## Response:

FortisBC confirms that the estimate of $\$ 66$ million referenced in the question includes all the listed cost categories.
34.1.1 Please provide a separate cost estimate for each cost category identified in the aforementioned IR as being excluded from the Itron estimate of PLC capital costs of $\$ 66$ million.

## Response:

Please refer to the response to BCUC IR No. 2 Q34.1.

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34.2 Please complete the following table. Column 5 should agree to the Itron estimate of the PLC capital costs of $\$ 66$ million. If there are any additional line items that are excluded from the table below, and specifically pertain to the PLC capital cost estimate, please update the table with any additional line items and provide an explanation for each one.

| Column: | 1 | 2 | 3 | 4 | 5 |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Line Item | AMI Project Capital Costs |  | PLC Capital Costs - Total | PLC Capital Costs Included in the Itron Estimate |
|  | Meters | 20,323 | A |  |  |
|  | Network Infrastructure and Installation | 4,449 | A |  |  |
|  | Head End System | - |  |  |  |
|  | Security Appliances | - |  |  |  |
|  | Professional Services | - |  |  |  |
|  | Third Party Software and Services | 5,830 | A |  |  |
|  | System Integration | 2,349 | A |  |  |
|  | Theft Detection | 1,100 | A |  |  |
|  | Project Management | 3,130 | A |  |  |
|  | CPCN Development / Approval Costs | 4,915 | A |  |  |
|  | Capitalized Overhead, AFUDC, PST | 5,592 | A |  |  |
|  | Total | 47,689 | A |  | 66,000 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| References: |  |  |  |  |  |
|  |  |  |  |  |  |
| A | Agreed to Exhibit B-1, Tab 5.0, p. 70, Table 5.1.a |  |  |  |  |

## Response:

Please see the responses to BCUC IR No. 2 Q33.1 and BCUC IR No. 2 Q33.2. The referenced Itron estimate did not include all project components. The $\$ 66$ million figure represents the total capital costs for a PLC solution based on the Itron estimate.

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Table BCUC IR2 Q34.2 - PLC AMI and RF AMI Capital Cost Comparison

| Line Item | AMI Project <br> Capital Costs | PLC Project <br> Capital Costs |
| :--- | ---: | ---: |
| Meters | $\$ 20,323$ | $\$ 20,489$ |
| Network Infrastructure and <br> Installation | $\$ 4,449$ | $\$ 18,492$ |
| Head End System | $\$ 0$ | $\$ 0$ |
| Security Appliances | $\$ 0$ | $\$ 0$ |
| Professional Services | $\$ 0$ | $\$ 0$ |
| Third Party Software and Services | $\$ 5,830$ | $\$ 7,872$ |
| System Integration | $\$ 2,349$ | $\$ 2,421$ |
| Theft Detection | $\$ 1,100$ | $\$ 1,100$ |
| Project Management | $\$ 3,130$ | $\$ 2,988$ |
| CPCN Development/Approval Costs | $\$ 4,915$ | $\$ 4,915$ |
| Capitalized Overhead, AFUDC, <br> PST | $\$ 5,592$ | $\$ 8,075$ |
| Total | $\$ 47,688$ | $\$ 66,352$ |

### 35.0 Reference: Project Costs

Exhibit B-1, Tab 7.0, p. 112; Exhibit B-6, BCUC IRs 1.106.4-1.106.5 Responses
Capital Costs, PLC Alternative
BCUC IR 1.106.5 requests the following: "How does [the Itron PLC] estimate compare on a unit costs basis with the actual costs experienced by Fortis Alberta in its roll-out of PLC based meters?"

In the response to BCUC IR 1.106.5, Fortis BC notes the following:
"The 126 million dollar FortisAlberta AMI expenditure that covers 470,000 customers results in a cost of approximately $\$ 268$ per customer.

This compares to the $\$ 47.7$ million expense proposed by Fortis BC covering 115,000 customer, or approximately $\$ 415$ per customer.

This cost is not directly comparable to the FortisBC expenditure for several reasons, including the fact that no costs related to HES or MDMS servers or software, provincial sales tax, regulatory process, contingency allowance, remote disconnects, theft

> detection metering or customer portal were incurred by FortisAlberta. These costs total approximately $\$ 11.4$ million in the Fortis BC AMI project.
> If FortisBC excludes those costs from its AMI project, the capital costs drops to approximately $\$ 36.3$ million of $\$ 316$ per customer. The bandwidth available with the FortisBC RF system at this expenditure level exceeds that available with the FortisAlberta PLC system. This allows hourly consumption data to be collected systemwide, for example, which challenges the FortisAlberta PLC system as described in the response to BCUC IR 1.113.1.1."
> 35.1 Please confirm that the FortisAlberta $\$ 126$ million dollar expenditure referenced in the response to BCUC IR 1.106 .5 relates to PLC meters, as opposed to RF meters. If not confirmed, please explain otherwise.

## Response:

FortisBC confirms that the $\$ 126$ million dollar expenditure referenced in the response to BCUC IR No. 1 Q106.5 relates to PLC meters and not to RF meters. Please also refer to the response to BCUC IR No. 2 Q32.2.1.
35.2 The Fortis BC response to BCUC IR 1.106.5 compares the FortisAlberta PLC expenditures to the Fortis BC AMI project capital costs; however, BCUC IR 1.106.5 requests a comparison between the FortisAlberta PLC expenditures and the Itron PLC estimate of $\$ 66$ million. Please compare the Itron PLC estimate of $\$ 66$ million to the FortisAlberta PLC expenditure on a unit costs basis, as requested in BCUC IR 10106.5.

## Response:

The \$66 million PLC estimate provided by Itron for covering FortisBC's 115,000 customers, equates to approximately $\$ 574$ per customer.

This figure is not comparable to the FortisAlberta figure of $\$ 268$ per customer for the same reasons that the FortisAlberta figure is not comparable to the proposed FortisBC AMI system cost of $\$ 415$ per customer that were detailed in the response to BCUC IR No. 1 Q106.5:

This cost is not directly comparable to the FortisBC expenditure for several reasons, including the fact that no costs related to HES or MDMS servers or software, provincial
sales tax, regulatory process, contingency allowance, remote disconnects, theft detection metering or customer portal were incurred by FortisAlberta.

The response to BCUC IR No. 2 Q32.2.1 provides an estimate of $\$ 55$ million for the FortisAlberta PLC system applied to FortisBC infrastructure. This figure, which equates to $\$ 478$ per customer, is more comparable to both the FortisBC and Itron estimates since it includes all of the missing elements above.
35.3 Please confirm if the following table prepared by Commission staff is correct. If not confirmed, please provide an updated table with an explanation for each individual change made.


## Response:

The referenced table is correct. However as discussed in response to BCUC IR No. 1 Q106.5, the FortisAlberta PLC system being used for comparison does not include all of the components, nor provide for all the functionality of the AMI system, proposed by FortisBC.

The cost per customer for the proposed FortisBC AMI system, with the costs adjusted to account for the reduced scope and functionality of the FortisAlberta system, is $\$ 316$ per customer as discussed in the response to BCUC IR No. 1 Q106.5. This figure is more comparable to the $\$ 268$ figure from FortisAlberta, although it still assumes PLC implementation on a distribution system similar to FortisAlberta.

The best cost comparison between the FortisAlberta PLC and proposed FortisBC RF systems arises from the calculation in the response to BCUC IR No. 2 Q32.2.1. This response provides an estimate of implementing the FortisAlberta PLC system on the FortisBC distribution system of $\$ 55$ million, or $\$ 478$ per customer. This estimate can be compared to the proposed FortisBC

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AMI system at $\$ 415$ per customer (although even these costs are not directly comparable for the reasons discussed in the response to BCUC IR No. 2 Q32.2.1).

The largest driver of the increased cost per customer of the PLC system is the lower customer/PLC injection point ratio at FortisBC (which average 2,100 customers per PLC injector) versus FortisAlberta (which averages 2,900 customers per PLC injector). A PLC injector is needed at each substation, with additional injectors required for split busses or when there are multiple distribution voltages at a substation.

### 36.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IR 1.113.1.2
Capital Costs, PLC Alternative under Fortis Alberta
The FortisBC response to BCUC IR 1.113.1.2 notes the following:
"FortisBC cannot definitively say why FortisAlberta received PLC system proposals. However two factors likely contributed: 1) PLC technology is best suited for utilities with low meter density per square kilometer, and 2) FortisAlberta required daily (rather than hourly) reads.

Lower meter density negatively impacts the economics of an RF mesh solution relative to a PLC solution since RF mesh technologies rely on meter-to-meter communication. FortisAlberta customer density is approximately 11.2 meters per square kilometre vs. FortisBC density of 38.6 meters per square kilometre."
36.1 Even though FortisAlberta uses daily, as opposed to hourly, meter reading, are the FortisAlberta PLC meters equipped to allow hourly meter reading?

## Response:

The FortisAlberta PLC meters are capable of providing hourly readings. However, as indicated in the response to BCUC IR No. 1 Q113.1.1, "FortisBC understands that the current generation of [FortisAlberta] PLC technology has restraints on the total number of hourly customers that can be supported off each substation."

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36.1.1 If the answer to the preceding IR is no, please comment on whether the current FortisAlberta PLC meters can be upgraded to allow hourly meter reading.

## Response:

Although the FortisAlberta PLC meters are technically capable of hourly reading, this is only possible where the meter count associated with a substation is not large. Where there are a larger number of meters connected to a substation, the FortisAlberta substation PLC equipment would need to be upgraded to the latest generation of PLC technology or a sufficient volume of meters transitioned to an RF mesh technology. Hourly reading also requires additional WAN equipment for redundancy purposes and implementation of an MDM head end.
36.1.1.1 If the answer to the preceding IR is yes, please discuss the process that would be required in order to upgrade the current FortisAlberta PLC meters to allow hourly meter reading.

## Response:

Please refer to the response to BCUC IR No. 2 Q36.1.1.
36.2 At present, does FortisBC require meter functionality that allows for hourly meter reading? Please explain.

## Response:

Yes, FortisBC currently uses hourly meter reading for large commercial, industrial and wholesale customers. This more granular data helps these customers understand and manage their consumption patterns and allows FortisBC to totalize and net their energy and demand readings as required. Until AMI, obtaining hourly readings for all customers was too expensive.

With respect to the initial implementation of $A M I$, FortisBC requires hourly data to provide maximum benefits with respect to:

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- Theft detection. Hourly reading allows more granular energy balancing and identification of theft consumption patterns.
- Providing customers with detailed energy use information to help them understand and manage their consumption (and thereby achieving the benefits associated with the Customer Information Portal).
36.2.1 If the answer to the preceding IR is no, please discuss when Fortis BC anticipates that it will require hourly meter reading functionality.


## Response:

Please refer to the response to BCUC IR No. 2 Q36.2.
36.3 Does the Fortis Alberta PLC system allow for hourly Time of Use billing? If not, please explain otherwise.

## Response:

Yes, the FortisAlberta PLC system allows for hourly time-of-use billing using meter registers (as opposed to using hourly data to calculate time-of-use billing determinants in the MDMS).

Register-based time-of-use billing requires the meter to be reconfigured each time a TOU rate period is changed.
36.4 Please list the main functional inadequacies of the Fortis Alberta PLC system as compared to the proposed Fortis BC requirements?

## Response:

Please refer to the response to BCUC IR No. 2 Q32.2.1.

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### 37.0 Reference: Project Costs and Benefits

## Exhibit B-6-5, BCUC IR 1.89.2 Revised Response

## Depreciation Rate, Manufacturer's Recommendations

In response to the BCUC IR requesting evidence of the manufacturer's recommendations supporting a useful life of 20 years for the Itron OpenWay CENTRON meters, Fortis BC provided an email from Itron dated November 8, 2012 that states: "In response to your query regarding the expected life of the OpenWay CENTRON meters, the expected life is 20 years." [Exhibit B-5-6, p. 8]

In the original Application dated July 26, 2012 Fortis BC notes the following with respect the expected useful life of the OpenWay CENTRON meters:
"Meters - Assumptions regarding depreciation rates for the AMI meters have been determined based on the observed useful lives as established through industry experience, as well as through the manufacturer's recommendations. This has resulted in a 5 percent depreciation rate based on an estimated economic life of 20 years"; [Exhibit B-1, Tab 5.0, p. 76]
37.1 Please provide any evidence to support the manufacturer's recommendations of the 20 year expected life of the AMI meters provided to Fortis before the original application date of July 26, 2012.

## Response:

Please refer to Attachment BCUC IR2 37.1.

From: Snyder, Jerrod [mailto:Jerrod.Snyder@itron.com]
Sent: March-30-12 11:48 AM
To: Dyck, Ian; Warren, Mark
Cc: Seaboldt, Bryan
Subject: Information regarding useful life of OpenWay CENTRON

Ian,
Per our discussion earlier this week, we are providing information to you regarding the useful life of the OpenWay CENTRON meter. As I noted at that time, Itron does not provide guidance on depreciation schedules, as those decisions are a function of utility policy. That said, we can provide information about failure rates to support FortisBC's decision process. I have provided information below. Please take a look and let me know if you think you need more.

Thanks,
Jerrod

Itron has a proven track record for highly reliable products. Several utilities have determined that for their purposes the OpenWay CENTRON Meter has a useful life expectancy of 20 years. This is based on a failure rate of less than $0.5 \%$ for single-phase meters and $0.75 \%$ for polyphase meters. Like all Itron meters and endpoints, our OpenWay components are designed to have a long, maintenance-free operating life.

Itron has performed many tests and measurements on the OpenWay CENTRON Meter to ensure that it is a reliable product. With more than 9 million meters deployed, we also have access to field data to determine the failure rates and reliability of the product. Currently, Itron can demonstrate field failure rates well below $0.5 \%$ for the combined product(s).

Here are some of the on-going tests that are run on the OpenWay CENTRON Meter:

- Outdoor Life Test—is run outside the Oconee Product Center at 240 V and 30 A in full, direct sunlight and exposure to the elements.
- HALT Testing—performed on powered and un-powered meters. The temperature is varied from $-90^{\circ} \mathrm{C}$ to $+130^{\circ} \mathrm{C}$.
- Temperature Humidity Test- $\left(80^{\circ} \mathrm{C} / 80 \%\right.$ REH $)$ : Performed on powered and unpowered test.
- Storage Test ( $50^{\circ} \mathrm{C} / 95 \%$ REH) —Performed in a high humidity location to simulate simple storage condition. This test is performed on unpowered meters.
- Elevated Temperature Test $\left(90^{\circ} \mathrm{C}\right)$-this test is performed on both powered and unpowered meters with periodic power outages to the former.

These tests allow us to accelerate the life of the product and predict the failure rate of the product. In addition, our field data allows us to calculate the number of true hours of operation that the product experienced before failure and, therefore, calculate failure rates.

Itron is well positioned to offer our robust warranty based on confidence in the reliability of Itron's current generation of metering products and our implementations of the following;

Reliability Engineering Group - established in 2001 with the expectation of setting an industry standard for reliability and life expectancy of solid state metering products.

Trace Expert System - first North American implementation offered by Trace Systems for tracking component level parts to one unique serial number and production period.
Independent Quality Validation - involvement by Clemson University and Maryland University (CALCE) in establishing life expectancy and product improvements year after year.

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### 38.0 Reference: Project Costs and Benefits <br> Exhibit B-6, BCUC IR 1.89.6 <br> Depreciation Rate

"If the depreciation period was set at 10 years for the new AMI meters, the NPV of the Net AMI benefit is approximately $\$ 13.5$ million (assuming an 8 percent discount rate) and the cumulative incremental benefit to rates in year 2025 is approximately 0.58 percent.
If the depreciation period was set at 15 years for the new AMI meters, the NPV of the Net AMI benefit is approximately $\$ 14.5$ million (assuming an 8 percent discount rate) and the cumulative incremental benefit to rates in year 2030 is approximately 0.87 percent.

If the depreciation period was set at 25 years for the new AMI meters, the NPV of the Net AMI benefit increases to approximately $\$ 19.9$ million (assuming an 8 percent discount rate) and the cumulative incremental benefit to rates in year 2032 decreases to approximately 0.87 percent." [Exhibit B-6, BCUC IR 1.89.6 Response]
38.1 Please confirm that the NPV of the Net AMI benefit will decrease by $\$ 4.1$ million (i.e. $\$ 13.5$ million versus $\$ 17.6$ million in Exhibit B-1-1, Excel Attachment, Tab "Net AMI") if the depreciation period is set at 10 years for the new AMI meters. If not confirmed, please explain otherwise.

## Response:

Confirmed.
38.2 Please confirm that the NPV of the Net AMI benefit will decrease by $\$ 3.1$ million (i.e. $\$ 14.5$ million versus $\$ 17.6$ million in Exhibit B-1-1, Excel Attachment, Tab "Net AMI") if the depreciation period is set at 15 years for the new AMI meters. If not confirmed, please explain otherwise.

## Response:

Confirmed.

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38.3 Please recalculate the revenue requirement impact of the depreciation of the new AMI meters (i.e. Line No. 63 Exhibit B-1-1, Excel Attachment, Tab "Gross AMI", Line No. 63) for each year between 2013 and 2032, assuming the following individual scenarios. Please provide the calculations in a working excel document.

- Useful life of 10 years
- Useful life of 15 years


## Response:

Assuming a useful life of 10 years reduces the net benefit of the AMI project to $\$ 3,699$ thousand from \$17,629 thousand.

Assuming a useful life of 15 years reduces the net benefit of the AMI project to $\$ 11,862$ thousand from \$17,629 thousand.

The requested working Excel files are provided as:

1. Electronic Attachment BCUC IR2 38.310 Years
2. Electronic Attachment BCUC IR2 38.315 Years

Please note the Company assumed that the replacement costs were escalated from 2014 and 2015 dollars at 1.8 percent per year and compliance meter exchanges were not replaced again at the end of the useful life.

### 39.0 Reference: Project Need

Exhibit B-1, Tab 3.0, p. 22
Clean Energy Act
"The Provincial Government has demonstrated its support for advanced metering for utilities other than BC Hydro. Section 17 (6) of the CEA provides:
(6) 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." [Exhibit B-1, Tab 3.0, p. 22]

> The Clean Energy Act defines "smart meter" in Section 17 (1) as follows: ""smart meter" means a meter that meets the prescribed requirements, and includes related components, equipment and metering and communication infrastructure that meet the prescribed requirements.' $\begin{aligned} & 39.1 \text { Does Fortis BC consider that PLC meters would be considered "smart meters" } \\ & \text { within the context of Section } 17 \\ & \text { (6) of the Clean Energy Act? Please discuss. }\end{aligned}$

## Response:

Assuming such meters complied with the prescribed requirements as provided in the associated Smart Meters and Smart Grid Regulation, they could be considered smart meters within the context of Section 17 (6) of the Clean Energy Act.

The majority of PLC systems installed in North America would not meet the requirements prescribed by Section 17 (1) (the Smart Meters and Smart Grid Regulation) since they do not support an in-home feedback device that transmits information in digital form to and receives information in digital form from an advanced meter.

Some PLC systems would not be able to comply with the requirement to provide meter readings at least as frequently as in 60-minute intervals.
39.2 Does Fortis BC consider that PLC meters would be considered "other advanced meters" within the context of Section 17 (6) of the Clean Energy Act? Please discuss.

## Response:

The term "other advanced meters" is not defined. However, it implies a high degree of sophistication even if not meeting the threshold for the definition of smart meter. PLC meters would need to be assessed on a case-by-case basis to determine if they were sophisticated enough to qualify.

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### 40.0 Reference: Project Costs and Benefits

## Exhibit B-6, IR 1.81.2 Response

## Theft Reduction Benefit, Marginal Revenue and Cost

"Marginal revenue is incremental revenue received per MWh at the residential tariff rate which is billed to FortisBC customers ( $\$ 120.04 .04$ per MWh in 2012).

Marginal cost is the incremental power purchase expense per MWh based on the BC Wholesale Market Energy Price Forecast (\$54.68 per MWh in 2012)." [Exhibit B-6, IR 1.81.2]
40.1 Please provide the detailed calculation of the $\$ 120.04$ per MWh marginal revenue figure, with reference to the actual residential tariff rate used.

## Response:

Please note the response to BCUC IR No. 1 Q81.2 should have indicated a 2012 MWh rate of $\$ 120.03$ per MWh as used in the financial analysis.
$\$ 120.03$ per MWh is 12.003 cents per kWh which is the residential tariff rate, effective July 1 (including the January 1 interim increase of 1.5 percent) for consumption above $1,600 \mathrm{kWhs}$ per bimonthly billing cycle.

### 41.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.56.3 Response

## Theft Reduction Benefit, Tracking Benefits

Fortis BC submits that the "Monitoring Plan" for the "Theft Reduction" benefit of the proposed AMI project is:
"Compare actual number of theft sites identified to the number of theft sites forecast on Row 26 of 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." [Exhibit B-6, BCUC IR 1.56.3]
41.1 Please confirm that Row 26 of the "Theft Reduction" worksheet relates to the "Number of Identified Theft Sites" under AMI. If not confirmed, please explain otherwise.

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## Response:

Confirmed.
41.2 Please confirm that Row 29 of the "Theft Reduction" worksheet relates to the "Recovered Revenue from Theft Identification" under AMI. If not confirmed, please explain otherwise.

## Response:

## Confirmed.

41.3 Please confirm that the "Monitoring Plan" discussed in BCUC IR 1.56.3Response relates to tracking the "Theft Reduction" benefit associated with an increase in identified theft sites and consequently an increase in revenue recovered from theft sites. If not confirmed, please explain otherwise.

## Response:

Not confirmed. The monitoring plan cannot track "an increase in identified theft sites" since the statement implies that the total number of theft sites in the Status Quo can be measured (in order to determine the difference between Status Quo and AMI). It is only possible to measure the total number of identified theft sites (and the total revenue recovered from them).
41.4 Please discuss what the "Monitoring Plan" is for tracking the theft reduction benefits associated with the AMI project for the following:

- The decrease in the total number of marijuana grow sites under the proposed AMI project, versus the Status Quo.
- The increase in the number of paying, illegal marijuana grow sites under the proposed AMI project versus the status quo.

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## Response:

FortisBC does not believe it is possible to develop a monitoring plan that measures increases or decreases in the total number of marijuana growth sites or the number of paying, illegal marijuana grow sites as compared to the Status Quo. If AMI is implemented, then it is not possible to measure what may have actually happened in the Status Quo.

Furthermore, although the total number of identified theft sites can be measured, it is not possible to measure the total number of marijuana growth sites or the number of paying, illegal marijuana grow sites, since the activity is clandestine.

### 42.0 Reference: Project Costs and Benefits

## Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction" <br> Theft Reduction Benefit, Recovered Revenue from Theft Sites

42.1 Please discuss the treatment of revered revenue from theft sites in Fortis BC's revenue requirement calculation. Specifically, please address the following:

- Does Fortis BC estimate the amount of revenue that will be recovered from theft sites and include the estimate as an offset to the Company's revenue requirement calculation?
- How does Fortis BC estimate the amount of revenue that will be recovered from theft sites?
- Is any variance between actual and forecast revenue recovered from theft sites captured in a variance account and credited to the ratepayer? If yes, please provide the name of the variance account. If not, please confirm if the variance flows to the shareholder as opposed to the ratepayer.
- Is revenue recovered from theft sites a monetary benefit to the shareholder or the ratepayer? Please discuss.


## Response:

Yes, FortisBC estimated the amount of revenue that will be recovered from theft sites and included the estimate as an offset to the Company's revenue requirement calculation. The estimate included forecasts of:

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- Revenue margin from increased/(decreased) paying sites,
- Power purchase reduction from (increased)/decreased theft sites,
- Recovered revenue from increased/(decreased) theft identification, and
- The difference in Back Billed Revenue at a 20 percent collection success for a one year average billing

On a forecast basis, there are no variances between actual and forecast revenue recovered from theft sites. Once actual theft recovery was realized, the variance would flow to the ratepayer. The monetary benefit will be to the benefit of the ratepayer as a result of both lower revenue requirements due lower power purchase costs, and through reduced rates due to higher net billable load.

### 43.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IR 1.33.1, p. 59
Meter Reading
BC Hydro estimated the average cost to read the five per cent of customers that would continue to be manual reads would be three times higher than the pre-Smart Meter costs. [Exhibit B-1, Appendix C-4, p. 27]

The FortisBC response to BCUC IR 1.33.1 includes Table BCUC IR 1.33.1.b which provides a comparison of the Status Quo meter reading costs, the Post-AMI meter reading costs for $1 \%$ manual meter reads and the Post-AMI meter reading costs for $5 \%$ manual meter reads, for each year until 2032.

Commission staff has prepared an analysis in Schedule 4 of Appendix 1 to BCUC IR 2 in order to compare the NPV of the incremental meter-reading benefit of the AMI-project with $1 \%$ manual meter-reads versus $5 \%$ manual meter-reads.
43.1 Please confirm that the calculation prepared by Commission staff in Schedule 4 is correct. If not confirmed, please provide an updated calculation in a working excel document and provide an explanation for each change made.

## Response:

Confirmed.
43.2 Please discuss how Fortis BC arrived at the assumption that only $1 \%$ of meters will require manual reads under the proposed AMI project.

## Response:

The assumption of 1 percent of meters requiring manual reads is based on the preliminary AMI radiofrequency propagation studies and the terms of the contract with Itron.

### 44.0 Reference: Project Costs and Benefits

Exhibit B-6, BCUC IR 1.70.1 Response, p. 159
Carrying Costs, Debt Return
"At the time of preparing the AMI application, reference was made to the Company's 2012-2013 RRA Evidentiary Update which had forecast weighted average cost of debt (WACD) of approximately 6.0 percent for 2012 and approximately 5.9 percent for 2013...the Company has forecast the same WACD for 2012 and a rate of 5.8 percent for 2013. The Company believes this is appropriate for the Project as this is the period in which the project would be financed. Once the debt associated with the project is issued, and the project is funded, future debt rates do not impact the economics of the project."
[Exhibit B-6, BCUC IR 1.70.1]
44.1 Fortis $B C$ submits in the response to BCUC IR 1.70.1 that "...future debt rates to not impact the economics of the project." Please confirm if the cost of debt included in Fortis BC's revenue requirement is based on the cost of debt for individual capital projects (i.e. the cost of debt for an individual capital project multiplied by the project capital costs for the same project) or the weighted average cost of debt for the Company as a whole.

## Response:

The cost of debt included in FortisBC's revenue requirement is based on the cost of debt for individual capital projects but is presented as the weighted average cost of debt for the Company as a whole. As individual projects are undertaken, the Company will issue long-term

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debt as required to finance the project. Over time as additional projects are undertaken, they too are financed at the debt rate at that time. The weighted average cost of debt for the Company is thereby comprised of many discrete debt issuances for discrete projects from previous periods. Therefore, future debt rates do not impact the economics of the project.

> 44.1.1 If the cost of debt included in Fortis BC's revenue requirement is based on the weighted average cost of debt for the Company as a whole, please explain further how the Company's future debt rates "do not impact the economics of the [AMI] project."

## Response:

Please refer to the response to BCUC IR No. 2 Q44.1.
44.2 Does Fortis $B C$ forecast the Company's long-term cost of debt? If confirmed, please provide Fortis BC's estimated weighted average cost of debt for each year between 2012 and 2032.

## Response:

The Company has not forecast the long-term cost of debt beyond 2013. In 2013, the Company expects to issue $\$ 120$ million of 30 year debt at a forecast rate of $4.75 \%$.
44.2.1 If the answer to the preceding IR is yes, please provide an updated cost of debt for the Status Quo and Gross AMI options, for each year between 2012 and 2032. Please provide calculations in a working excel document.

## Response:

Please refer to the response to BCUC IR No. 2 Q44.2.

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### 45.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.70.1 Response, p. 159

New Operating Costs - Baselines from Long Term Resource Plan
45.1 Please provide the forecast operating and maintenance expenditures for FortisBC as a whole, excluding the forecast new operating costs associated with the AMI project, for each individual year between 2013 and 2032, by the following categories:
o Power purchase management expense
o Generation
$0 \quad$ Utility operations
o Mandatory reliability standards
$0 \quad$ Cominco facility charge
o Brilliant Terminal Station
$0 \quad$ Internal Audit
$0 \quad$ Legal \& Regulatory
$0 \quad$ Customer Service
$0 \quad$ Community \& Aboriginal Affairs
0 Communications
o Human Resources
o Information Technology
$0 \quad$ Health, Safety \& Environment
$0 \quad$ Facilities Management
$0 \quad$ Finance \& Accounting
o Transportation Services
$0 \quad$ Supply Chain Management
o Corporate \& Executive Management

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## Response:

The Company does not forecast operating and maintenance expenditures at the level of detail requested beyond regulatory test years. The Company submitted detailed operating and maintenance expenditure forecasts in its 2012 - 2013 RRA and based on the Commission Decision, can provide those forecasts as below:

Table BCUC IR2 Q45.1-2012/2013 Operating and Maintenance Expenditures

|  | $\mathbf{2 0 1 2}$ | $\mathbf{2 0 1 3}$ |
| :--- | ---: | ---: |
| Category | $(\$ 000 \mathrm{~s})$ |  |
| Power Purchase Management Expense | 1,069 | 1,124 |
| Generation | 2,282 | 2,492 |
| Utility Operations | 18,236 | 18,695 |
| Mandatory Reliability Standards | 1,179 | 1,187 |
| Teck Facility Charge | 46 | 46 |
| Brilliant Terminal Station | 3,160 | 3,192 |
| Internal Audit | 396 | 393 |
| Legal and Regulatory | 1,672 | 1,702 |
| Customer Service | 6,624 | 6,706 |
| Community \& Aboriginal Affairs | 509 | 517 |
| Communications | 923 | 952 |
| Human Resources | 1,840 | 1,874 |
| Information Systems | 2,841 | 2,846 |
| Health, Safety and Environment | 925 | 953 |
| Facilities Management | 3,685 | 3,466 |
| Finance and Accounting | 3,275 | 3,360 |
| Transportation Services | 573 | 593 |
| Supply Chain Management | 498 | 505 |
| Corporate \& Executive Management | 5,112 | 5,674 |
|  | 54,843 | $\mathbf{5 6 , 2 7 7}$ |
| TOTAL O\&M |  |  |


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|  | AMI New Operating and Maintenance Costs (\$000s) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | 2013 | 2014 | 2015 | 2016 | 2017 |
| Customer Service Information Systems | 0 | 408 | 951 | 969 | 994 |
|  | 0 | 468 | 577 | 588 | 598 |
|  | 0 | 875 | 1,529 | 1,556 | 1,591 |
|  | 2018 | 2019 | 2020 | 2021 | 2022 |
| Customer Service Information Systems | 1,012 | 992 | 1,006 | 1,021 | 1,036 |
|  | 608 | 619 | 630 | 641 | 652 |
|  | 1,620 | 1,611 | 1,636 | 1,662 | 1,688 |
| Customer Service Information Systems | 2023 | 2024 | 2025 | 2026 | 2027 |
|  | 1,051 | 1,067 | 1,083 | 1,099 | 1,115 |
|  | 663 | 675 | 687 | 699 | 711 |
|  | 1,715 | 1,742 | 1,769 | 1,798 | 1,826 |
| Customer Service Information Systems | 2028 | 2029 | 2030 | 2031 | 2032 |
|  | 1,132 | 1,149 | 1,166 | 1,183 | 1,201 |
|  | 724 | 736 | 749 | 763 | 776 |
|  | 1,855 | 1,885 | 1,915 | 1,946 | 1,977 |

45.1.1 Please provide the AMI project New Operating Costs per Exhibit B-11, Excel Attachment, Tab "Gross AMI" Line No 46, broken out into the categories above, for each year between 2013 and 2032.

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### 46.0 Reference: Project Costs and Benefits <br> Exhibit B-1-1, Chapter 5, p. 72 \& Table 5.1.1.a, Updated p. 73; Exhibit B-6 <br> AMI Development and Regulatory Costs <br> "Fortis BC has been developing [the] CPCN Application over the past several years, capturing the costs in a non-rate base deferral account, and reporting the details to the Commission in the relevant revenue requirement filings. These deferred expenditures have been included in [the] Application as part of the Project and for Commission approval as part of the CPCN Application, and, following Project approval, will be amortized over the life of the Project." [Exhibit B-1-1, Chapter 5, p. 72] <br> Table 5.1.1.a summarizes the total AMI development and regulatory costs of $\$ 4,915$ thousand. [Exhibit B-1-1, Chapter 5, p. 72] <br> 46.1 Is the non-rate base deferral account for the AMI development and regulatory costs approved by Commission Order? If yes, please provide the reference for the relevant Order.

## Response:

Yes, please refer to Order G-162-09 which approved the negotiated settlement pertaining to the Company's 2010 Revenue Requirement application.
46.1.1 Please comment on whether the Commission has approved the recovery of the AMI development and regulatory costs in rates.

## Response:

The Commission had not previously approved the recovery of the AMI development and regulatory costs in rates as the Company had not previously applied for such recovery. FortisBC's request for approval to recover the AMI development and regulatory costs, as part of the proposed Project, is included as part of this AMI CPCN application.
46.2 Please confirm if the development and regulatory costs of $\$ 4,915$ thousand are all costs that would normally be capitalized under US GAAP. If yes, please

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provide an explanation as to why these costs are considered capital costs, with reference to the applicable FASB ASC US GAAP Section.

## Response:

Confirmed.
Where the regulator has provided approval for capitalization of costs, rate-regulated utilities normally capitalize costs under US GAAP ASC 980, Regulated Operations. ASC 980-10-05-5 indicates that "regulators sometimes include costs in allowable costs in a period other than the period in which the costs would be charged to expense by an unregulated entity. For the regulated entity, that procedure can...create assets (future cash inflows that will result from the rate-making process)."

The Company expects that these costs would be approved for transfer to the AMI capital project, and therefore create future cash inflows from the rate-making process, for two reasons; first, the Company has historically capitalized development and regulatory costs as part of capital projects and that treatment has been approved by the regulator and therefore would conform to ASC 980. Secondly, included in BCUC Order G-110-12 for the Company's 20122013 RRA Decision was the direction that the AMI development and regulatory costs would be transferred to the capital project once the project was approved. The capitalization of these costs was supported by the statement "the Commission Panel is of the view that the costs incurred in respect of a CPCN Application should not form part of rate base until such time as the capital project is approved" and that "this account is to attract an interest financing charge at FortisBC's WACD going forward, until such time as a determination on the CPCN Application is made."
46.2.1 If the answer to the preceding IR is yes, and the development and regulatory costs of $\$ 4,915$ thousand are all costs that would normally be capitalized under US GAAP, please comment on why a non-rate base deferral account is required.

## Response:

As per the Commission Panel Determination on page 125 of Order G-110-12, "the costs incurred in respect of a CPCN Application should not form part of rate base until such time as the capital project is approved."

A non-rate base deferral account is required in order to eliminate any impact on customer rates until the AMI project is implemented.

This treatment is similar to the treatment of Capital Work in Progress (CWIP) where CWIP is held outside of rate base, and attracts an Allowance for Funds Used During Construction (AFUDC) but is not included in rate base for rate setting purposes.

It is only when the assets are deemed "Used and Useful" that the assets are included in rate base.
46.3 Does Fortis BC consider that all US GAAP criteria under ASC 980 have been met for the AMI development and regulatory costs to be included in a non-rate base deferral account? Please explain.

## Response:

Yes, Fortis BC considers that all US GAAP criteria under ASC 980 have been met for the AMI development and regulatory costs to be included in a non-rate base deferral account. ASC 980-340-25-1 discusses the criteria that must be met in order to recognize a regulatory asset.

25-1 Rate actions of a regulator can provide reasonable assurance of the existence of an asset. An entity shall capitalize all or part of an incurred cost that would otherwise be charged to expense if both of the following criteria are met:
a. It is probable (as defined in Topic 450) that future revenue in an amount at least equal to the capitalized cost will result from inclusion of that cost in allowable costs for rate-making purposes.
b. Based on available evidence, the future revenue will be provided to permit recovery of the previously incurred cost rather than to provide for expected levels of similar future costs. If the revenue will be provided through an automatic rate-adjustment clause, this criterion requires that the regulator's intent clearly be to permit recovery of the previously incurred cost.

The AMI development and regulatory costs meet the above two criteria.
For the first criterion, probable is defined in ASC 450 as "the future event or events are likely to occur". Whether the AMI development and regulatory costs will be recovered will be based on the final determinations made by the Commission. However, it is common practice for regulated utilities to capitalize prudently incurred costs as regulatory assets prior to receiving a regulatory rate order. FortisBC believes the AMI development and regulatory costs, which include the cost

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of filing applications, performing studies, and various other planning costs, have been prudently incurred and that there is the expectation of recovery through future rates.

The second criterion is met for the AMI development and regulatory costs because the rate recovery in future rates would result from previously incurred costs, not for expected levels of similar future costs.

Furthermore, ASC 980-10-05 indicates that assets may be recognized if a regulatory order has been received to include costs to a period other than the period in which the costs would be charged to expense by a non-regulated entity. This criterion is satisfied in the case of the AMI development and regulatory costs which were approved by Commission Order G-110-12 for the Company's 2012-2013 RRA as a non-rate base deferral account to be transferred to the capital project.
46.4 Please provide the revised NPV of the proposed AMI project (i.e. Line No. 5 of Exhibit B-1-1, Excel Attachment, Tab "Net AMI") if the AMI development and regulatory costs are amortized over a period of 2, 5 and 10 years. Please provide the calculation in a working excel document.

## Response:

Please refer to the electronic attachments:

1. Electronic Attachment BCUC IR2 46.4-2 Year
2. Electronic Attachment BCUC IR2 46.4-5 Year
3. Electronic Attachment BCUC IR2 46.4-10 Year

Please note that in all cases, the amortization of the regulatory costs begins in 2015.
46.5 Please confirm if the AFUDC applied to the AMI development and regulatory costs is approved by Commission Order. If confirmed, please provide a reference to the Commission Order.

1

## Response:

AFUDC was accrued pursuant to a specific agreement made in the 2011 RRA NSA, which was approved by Commission Order G-184-10 on a without prejudice basis. Subsequently, per Order G-110-12 the Company was directed by the Commission that the account was to attract an interest financing charge at FortisBC's Weighted Average Cost of Debt beginning in 2012, until such time as a determination on the CPCN Application is made.

### 47.0 Reference: Project Costs and Benefits

Exhibit B-1, Chapter 5, pp. 92-95; Exhibit B-6, BCUC IR 1.48.2 Response
Measurement Canada Compliance
"[Table 5.3.4.a] outlines the costs to replace the Fortis BC electro-mechanical fleet under the new S-S-06 regulations, assuming the population is managed to the end of its life. Because this expenditure will be required if an AMI Project does not replace these meters, the benefit is an avoided cost that would no longer be required by another project. The costs include the meters, deployment and disposal for the approximately 88,000 electro-mechanical meters that would require replacement." [Exhibit B-1, Chapter 5, p. 94]
"The avoidance of capital costs related to the revised Measurement Canada sampling plans represents a benefit to FortisBC customers of $\$ 9.8$ million as evaluated on a net present value basis." [Exhibit B-1, Chapter 5, p. 94]
"The AMI Project will result in the replacement of nearly all existing meters with new AMI enabled meters. This will avoid operating costs that would have been incurred sampling and retesting meters for six years after meter deployment. After year six, the cost of meter exchanges is expected to begin returning to the pre-AMI deployment levels." [Exhibit B-1, Chapter 5, p. 94]
"The avoidance of costs related to the ongoing meter exchanges represents a benefit to FortisBC customers of $\$ 0.8$ million as evaluated on a net present value basis." [Exhibit B-1, Chapter 5, p. 95]
The following table was provided by Fortis BC in response to BCUC IR 1.48.3:

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47.1 Please confirm that the Cost per Meter for "Total MC Compliance plus Meter Replacement" in the table provided by Fortis BC in response to BCUC IR 1.48.3 is in thousands. For example, the cost per meter in 2014 is $\$ 0.16$.

## Response:

Confirmed. The potential for misunderstanding is caused by the fact that the 2013 figure is stated "not" in thousands, while from 2014-2032 the figures show "in thousands". FortisBC provides the following table amended so that all cells report in the same fashion.

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Table BCUC IR2 Q47.1

| Status Oue | Dec-13 | Deo-14 | Deo-15 | Deo-16 | Deo-17 | Deo-18 | Deo-19 | Deo-20 | Deo-21 | Dec-22 | Deo-23 | Deo-24 | Dec-25 | Deo-26 | Deo-27 | Deo-28 | Deo-29 | Deo-30 | Dec-31 | Deo-32 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  | Susta | ing Capital |  |  |  |  |  |  |  |  |  |  |  |
| Meter Growh ( $\mathbf{5 0 0 0}$ ) | \$119 | \$125 | \$122 | \$125 | \$125 | \$128 | \$131 | \$129 | \$132 | \$134 | *135 | \$139 | \$140\| | \$141 | \$142 | \$145 | \$147 | \$147\| | \$148 | 151 |
| Total New Meters installed year | 2,252 | 2,325 | 2,236 | 2,236 | 2,210 | 2,217 | 2,226 | 2,164 | 2,169 | 2,161 | 2,132 | 2,162 | 2,143 | 2,123 | 2,103 | 2,099 | 2,087 | 2,053 | 2.028 | 2.033 |
| Cost per Meter | 452.78 | 453.73 | 454.70 | \$55.69 | \$56.69 | 457.71 | \$58.75 | 459.81 | ${ }^{660.88}$ | ${ }^{661.98}$ | ${ }^{563.09}$ | \$64.23 | ${ }^{365.38}$ | ${ }^{666.56}$ | ${ }^{667.76}$ | ${ }^{568.98}$ | \$70.22 | \$77.49 | ${ }^{472.77}$ | \$74.08 |
| Meter Replacement( 5000 ) | \$41 | \$67 | *62 | ${ }^{881}$ | ${ }^{566}$ | \$110\| | 4531 | \$25 | \$31 | \$41 | \$36 | \$32 | \$22 | * 19 | \$26 | \$22 | \$23 | \$32 | \$13 | *8 |
| TotalMeters Replaced | 1117 | 1768 | 1612 | 2059 | 1411 | 2707 | 1296 | 595 | 720 | 942 | 823 | 707 | 478 | 399 | 556 | 460 | 468 | 639 | 256 | 159 |
| Cost per Meter | ${ }^{337.09}$ | \$37.76 | ${ }^{338.44}$ | ${ }^{\$ 39.13}$ | ${ }^{\$ 39.83}$ | ${ }^{\text {440.55 }}$ | \$4.1.28 | ${ }^{44.02}$ | ${ }^{542.78}$ | ${ }^{\text {\$43.55 }}$ | ${ }^{54.33}$ | ${ }^{445.13}$ | ${ }^{545.94}$ | ${ }^{46.77}$ | \$47.61\| | \$48.47 | \$49.34 | *50.23 | ${ }_{551.13}$ | \$52.06 |
| MC Compliance - Testing(\$000) | \$146 | \$909 | \$903 | \$1,478 | \$976 | \$2,310 | \$1.072 | \$1.645 | \$1,229 | \$1.070 | \$1,452 | 8820 | \$1,324 | ${ }^{4886}$ | 4501 | \$293 | ${ }^{4} 306$ | \$302 | \$432 | 5901 |
| Total Meters Tested | 0 | 4295 | 4169 | 7325 | 4419 | 11592 | 4741 | 7653 | 5350 | 4429 | 6241 | 3018 | 5368 | 1296 | 1327 | 338 | 372 | 329 | 865 | 2821 |
| Cost per Meter |  | \$211.54 | \$216.60 | \$201.79 | \$220.90 | \$199.28 | ${ }^{5226.08}$ | ${ }^{5214.95}$ | \$229.68 | ${ }^{\$ 24148}$ | \$232.70 | ${ }^{127.181}$ | ${ }^{5246.58}$ | \$374.84 | \$377.71 | ${ }^{8868.18}$ | ${ }^{\$ 823.43}$ | ${ }^{5918.47}$ | ${ }^{5499.48}$ | \$319.27 |
| MC Compliance - Testing( 5000 ) | \$146 | *909 | \$903 | \$1.478 | \$976 | \$2,310 | \$1.072 | \$1,645 | \$1,229 | \$1,070 | \$1,452 | 8820 | \$1,324 | ${ }^{4486}$ | ${ }_{5} 501$ | \$293 | ${ }^{5} 306$ | \$302 | \$432 | \$901 |
| Total Comploiance Groups Tested | 0 | 18 | 17 | 20 | 9 | 29 | 11 |  |  | 10 | 15 |  |  |  | 8 | 5 | 4 | 5 | 2 |  |
| Cost per Compliance Group |  | \$50.474.44 | \$53,116.83 | \$73,906.67 | \$108.462.0] | \$79.655.25 | \$97.442.59 | \$328,998.89 | \$204.799.31 | \$106.952.51 | ${ }^{\text {\$96,813.65 }}$ | \$117.189.92 | ${ }^{866,825.16}$ | \$161,932.63 | \$62.652.64 | \$58.688.91 | \$76.579.45 | \$60,435.32 | \$216.026.00 | ${ }^{\text {\$450,33.96 }}$ |
| Total MC Compliance plus Meter Replacement (\$000) | *188 | \$975 | \$965 | \$1,559 | \$1,032 | \$2,420 | \$1,125 | \$1.670 | \$1,260 | *1,111 | \$1,489 | \$852 | \$1,346 | *504 | *528 | \$316 | \$329 | \$334 | \$445 | *909 |
| Total Meters Replaced | 1117 | 6063 | 5781 | 9384 | 5830 | 14299 | 6037 | 8248 | 6070 | 5371 | 7064 | 3725 | 5846 | 1695 | 1883 | 798 | 840 | 968 | ${ }^{1121}$ | 2980 |
| Cost per Meter | \$168.23 | \$160.86 | \$166.92 | $\$ 166.10$ | \$177.08 | \$169.23 | \$186.41 | ${ }^{2} 202.47$ | ${ }^{2077.51}$ | \$206.77 | \$210.75 | ${ }^{2228.79}$ | \$230.18 | \$297.62 | $\$ 280.24$ | ${ }^{\text {3 395.67 }}$ | ${ }^{\text {\$392.15 }}$ | ${ }^{\$ 345.32}$ | \$397.09 | \$305.02 |
| 1 IHardware, Lieencing, and Support Costs (\$000). | t0 | s0 | \$0 | t0 | 40 | \$0 | t0 | t0 | \$0 | s0 | 50 | 50 | ${ }_{50}$ | s0 | $\pm 0$ | t0 | \% 0 | s0 | \$0 | \$0 |
| Total Meters Installed |  | 0 |  | 0 | , | 0 | 0 | 0 | 0 | 0 | 0 | 0 | , | 0 | 0 | 0 | 0 | 0 | 0 | - |
| Cost per Meter | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | ${ }^{50.00}$ | \$0.00 | ${ }^{50.00}$ | \$0.00 | \$0.00 | ${ }^{80.00 \mid}$ | ${ }^{50.00}$ | \$0.00 |


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47.2 Commission staff has prepared Schedule 5 in Appendix 1 to BCUC IR 2 as a comparison of the cost per meter due to (F) Meter Growth (G) Meter Replacement and (C) Meter Replacement due to Measurement Canada Compliance. Please confirm if the calculations in Schedule 5 are correct. If not confirmed, please provide an updated table and provide an explanation for each change made.

## Response:

Confirmed, the calculations in Schedule 5 are correct. Note that the reference should be to BCUC IR No. 1 Q48.2, not to Q48.3 as stated in the preamble.
47.2.1 Based on the table prepared by Commission staff in Schedule 5, in each year between 2013 and 2032 the cost per meter of meter replacement due to Measurement Canada Compliance significantly exceeds the cost per meter of both Meter Replacement and Meter Growth. For example, in 2013, the cost per meter for each scenario is as follows:

Cost per meter - Measurement Canada compliance $=\mathbf{\$ 2 1 1 . 5 4}$
Cost per meter - Meter Growth $=\$ 53.73$
Cost per meter - Meter Replacement $=\$ 37.76$
Please explain why the capital cost per meter for Measurement Canada Compliance significantly exceeds the capital cost per meter due to Meter Growth and Meter Replacement.

## Response:

Measurement Canada compliance costs of $\$ 211.54$ per meter (in 2014) represents the translation of all of the compliance project-related costs into a cost per meter basis, and include the following:

- \$37.76 - cost of meter
- \$107.51 - cost of labour to switch out the meter
- \$2.11 - disposal cost of meter
- $\$ 2.44$ - back office cost per meter
- $\$ 61.72$ - the sum of project management, contact center call volume associated with meter change-out program, parallel meter accuracy checks, and capitalized overhead all divided by the number of meters for a "cost per meter".

Meter Growth costs of $\$ 53.73$ per meter (in 2014) is just the cost of the meter, derived from the 2010 average meter cost inflated to the year in question. All other costs are part of operational budgets.

Meter Replacement costs of $\$ 37.76$ per meter (in 2014) is just the cost of the meter, derived from the 2011 cost of the majority of meters in the FortisBC meter fleet, inflated to the year in question. All other costs are part of operational budgets.
47.2.2 Please provide a schedule calculating the Measurement Canada Compliance capital costs under the Status Quo for each year between 2013 and 2032, using the cost per meter for Meter Growth, as calculated by Fortis BC in the response to BCUC IR 1.48.2. Please provide the calculation in a working excel document.

## Response:

Please see the response for BCUC IR No. 2 Q47.2.1, which describes the breakdown of the Measurement Canada Compliance capital costs under the Status Quo, on a cost per meter basis.

The Company understands that there are two ways in which to answer the posed question:

- Method A) replace the $\$ 211.54$ cost per meter (as per the application) with the indicated $\$ 53.73$ cost per meter, and recalculate the aggregate Measurement Canada Compliance costs, or
- Method B) replace only the $\$ 37.76$ "meter cost" portion of the $\$ 211.54$ with the indicated $\$ 53.73$ (leaving all other inputs as is), and recalculate the aggregate Measurement Canada Compliance costs.

Please see Method A and Method B schedules shown below, which are also provided as Electronic Attachment BCUC IR2 47.2.2.

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[^1]Method A:


Method A excludes all other capital project related costs and results in an understated cost per meter figure.

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## Method B:



### 48.0 Reference: Project Costs and Benefits

## Exhibit B-1-1, Excel Attachment, Line No. 31; Exhibit B-11, BCPSO IR 1.38.4, p. 25; <br> Measurement Canada Compliance

According to the NPV analysis in Exhibit B-1-1, the Measurement Canada Compliance capital costs are zero between 2012 and 2032 under the proposed AMI project, the PLC alternative and the AMR alternative. [Exhibit B-1-1, Excel Attachment, Line No. 31 of Tab "Gross AMI", "Gross PLC" and "Gross AMR", respectively]

According to the NPV analysis in Exhibit B-1-1, the Measurement Canada Compliance capital costs are $\$ 18,555$ thousand between 2012 and 2032 under the Status Quo option. [Exhibit B-1-1, Excel Attachment, Tab "Status Quo", Line No. 31]

BCPSO IR 1.38.4 requests the following information: "Are there Measurement Canada compliance costs associated with the new AMI enabled meters? If yes, are they included in the New Operating Costs?" [Exhibit B-11, BCPSO IR 1 Q38.4, p. 25] In response to BCPSO IR 1 Q 38.4, Fortis BC submits that "The net Measurement Canada compliance costs (the difference between compliance costs for Status Quo and AMI meters) are included in the Meter Exchanges row." [Exhibit B-11, BCPSO IR 1.38.4, p. 25]
"[Table 5.3.4.a] outlines the costs to replace the Fortis BC electro-mechanical fleet under the new S-S-06 regulations, assuming the population is managed to the end of its life. Because this expenditure will be required if an AMI Project does not replace these meters, the benefit is an avoided cost that would no longer be required by another project. The costs include the meters, deployment and disposal for the approximately 88,000 electro-mechanical meters that would require replacement." [Exhibit B-1, Chapter 5, p. 94]
48.1 Please discuss why there is no capital cost associated with meter replacements due to Measurement Canada Compliance under the proposed AMI project. [Exhibit B-1-1, Excel Attachment, Line No. 31, Tab "Gross AMI"]

## Response:

There are capital costs associated with meter replacements due to Measurement Canada Compliance under the proposed AMI project.

In the normal course compliance exchanges are separated into the capital costs associated with acquisition of meters and the operating costs associated with the compliance program. The

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capital costs are captured on line 29 "Meter Growth and Replacement" of the Net AMI schedule, and the operating costs are captured on line 49 "Meter Exchanges" of the Net AMI schedule.

As is stated in the Application in Section 5.3 .5 (pg 94), "the AMI Project will result in the replacement of nearly all existing meters with new AMI enabled meters. This will avoid operating costs that would have been incurred sampling and retesting meters for six years after meter deployment". Similarly, the capital costs of the new AMI meters would also be avoided for six years. Line 29 of the Net AMI schedule demonstrates the associated capital costs beginning in 2022, running until 2025 (the time period required for compliance testing of the complete meter fleet), and then starting again in 2032.
48.1.1 Does Fortis BC consider that meter replacements due to Measurement Canada Compliance will be zero under the proposed AMI project? Please discuss this, taking into consideration that the Measurement Canada Compliance capital costs are estimated to be zero over a twenty year period under the proposed AMI project. [Exhibit B-1-1, Excel Attachment, Line No. 31, Tab "Gross AMI"]

## Response:

Please refer to the response for BCUC IR No. 2 Q48.1.
48.1.1.1 If the answer to the preceding IR is no, please provide separate schedules for both the proposed AMI project and Status Quo with a) the total estimated capital costs of Meter Replacement due to Measurement Canada Compliance for each year between 2013 and 2032 and b) the number of meters that are expected to be replaced each year.

## Response:

Please see the response for BCUC IR No. 2 Q48.1. The requested schedule is provided below:

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Table BCUC IR2 Q48.1.1.1

| Stitas On | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \# Meters in sample groups | 1117 | 1768 | 1612 | 2059 | 1411 | 2707 | 1296 | 595 | 720 | 942 | 823 | 707 | 478 | 399 | 556 | 460 | 468 | 639 | 256 | 159 |
| cost per Meter | 37.09 | 37.76 | 38.44 | 39.13 | 39.83 | 40.55 | 41.28 | 42.02 | 42.78 | 43.55 | 44.33 | 45.13 | 45.94 | 46.77 | 47.61 | 48.47 | 49.34 | 50.23 | 51.13 | 52.06 |
| New Meter Costs | \$ 41,430 | \$ 66.756 | \$ 61.961 | 80,567 | \$ 56,205 | \$ 109.770 | \$ 53.499 | \$ 25,004 | \$ 30.802 | \$ 41,024 | 36,487 | \$ 31,908 | 21,961 | \$ 18.662 | \$ 26,473 | \$ 22,296 | \$ 23,092 | \$ 32,097 | \$ 13.091 | \$ 8,277 |


| 边 ${ }^{\text {d }}$ | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \# Meters in sample groups | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1872 | 1872 | 1872 | 1872 | 156 | 156 | 156 | 156 | 156 | 156 | 1872 |
| cost per Meter | 125.10 | 127.35 | 129.64 | 131.97 | 134.35 | 136.77 | 139.23 | 141.74 | 144.29 | 146.88 | 149.53 | 152.22 | 154.96 | 157.75 | 160.59 | 163.48 | 166.42 | 169.42 | 172.47 | 175.57 |
| New Meter Costs | \$ | \$ | \$ | \$ | \$ | \$ - | \$ - | \$ - | \$ | \$ 274,967 | \$ 279,916 | \$ 284,954 | \$ 290,084 | \$ 24,609 | \$ 25,052 | \$ 25,503 | \$ 25,962 | \$ 26,429 | \$ 26,905 | \$ 328,668 |


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48.2 Please discuss why there is no capital cost associated with meter replacements due to Measurement Canada Compliance under the PLC alternative [Exhibit B-11, Excel Attachment, Line No. 31, Tab "Gross PLC"]

## Response:

There are capital costs associated with meter replacements due to Measurement Canada Compliance under the PLC alternative. Please see the response for BCUC IR No. 2 Q48.1.
48.3 Please discuss why there is no capital cost associated with meter replacements due to Measurement Canada Compliance under the AMR alternative. [Exhibit B-1-1, Excel Attachment, Line No. 31, Tab "Gross AMR"]

## Response:

There are capital costs associated with meter replacements due to Measurement Canada Compliance under the AMR alternative. Please see the response for BCUC IR No. 2 Q48.1.
48.4 Please provide the detailed supporting calculations in a working excel document used by Fortis BC to calculate the Measurement Canada Compliance meter replacement costs in Exhibit B-1-1, Excel Attachment, Tab "Status Quo", Line No. 31.

## Response:

Please see the following table, also provided in Electronic Attachment BCUC IR2 48.4.

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| :---: | :---: | :---: |
| Application for a Certificate of Public Convenience and Necessity |  |
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Table BCUC IR2 48.4 - Meter Replacement Costs

|  |  | 2012 | 2013 |  | 2014 |  | 2015 |  | 2016 |  | 2017 |  | 2018 |  | 2019 | 2020 |  | 2021 |  | 2022 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EM Meters to be Replaced |  |  |  |  | 3678 |  | 3501 |  | 6884 |  | 3884 |  | 11168 |  | 4407 | 7204 |  | 4708 |  | 3738 |
| Electronic Meters to be Replaced |  |  |  |  | 617 |  | 668 |  | 441 |  | 535 |  | 424 |  | 334 | 449 |  | 642 |  | 691 |
| Total Meters to be replaced |  |  |  |  | 4295 |  | 4169 |  | 7325 |  | 4419 |  | 11592 |  | 4741 | 7653 |  | 5350 |  | 4429 |
| cost per Meter |  | 36.43 | 37.09 |  | 37.76 |  | 38.44 |  | 39.13 |  | 39.83 |  | 40.55 |  | 41.28 | 42.02 |  | 42.78 |  | 43.55 |
| New Meter Costs | \$ | \$ - |  | \$ | 162,169 | \$ | 160,245 | \$ | 286,621 | \$ | 176,024 | \$ | 470,061 | \$ | 195,710 | \$ 321,605 | \$ | 228,872 | \$ | 192,883 |
| Replacement Labour Costs / Meter |  | \$103.80 | \$105.66 |  | \$107.57 |  | \$109.50 |  | \$111.47 |  | \$113.48 |  | \$115.52 |  | \$117.60 | \$119.72 |  | \$121.87 |  | \$124.07 |
| Replacement Labour Costs | \$ | \$ - |  | \$ | 461,994 | \$ | 456,513 | \$ | 816,538 | \$ | 501,465 | \$ | 1,339,130 | \$ | 557,548 | \$ 916,203 | \$ | 652,021 | \$ | 549,492 |
| Disposal Costs / Meter |  | \$2.04 | \$2.07 |  | \$2.11 |  | \$2.15 |  | \$2.19 |  | \$2.23 |  | \$2.27 |  | \$2.31 | \$2.35 |  | \$2.39 |  | \$2.43 |
| Displosal Costs | \$ | S |  | \$ | 9,062 | \$ | 8,955 | \$ | 16,017 | \$ | 9,837 | \$ | 26,268 | \$ | 10,937 | \$ 17,972 | \$ | 12,790 | \$ | 10,779 |
| BackOffice Costs / meter |  | \$2.35 | \$2.39 |  | \$2.44 |  | \$2.48 |  | \$2.53 |  | \$2.57 |  | \$2.62 |  | \$2.66 | \$2.71 |  | \$2.76 |  | \$2.81 |
| BackOffice Costs | \$ | \$ |  | \$ | 10,467 | \$ | 10,343 | \$ | 18,499 | \$ | 11,361 | \$ | 30,339 | \$ | 12,632 | \$ 20,757 | \$ | 14,772 | \$ | 12,449 |
| Contact Centre Call Volume increa | \$ | \$ - |  | \$ | 4,269 | \$ | 4,346 | \$ | 4,510 | \$ | 4,591 | \$ | 4,764 | \$ | 4,850 | \$ 5,027 | \$ | 5,117 | \$ | 5,301 |
| parallel meter accuracy checks | \$ | \$ - |  | \$ | 18,200 | \$ | 18,528 | \$ | 18,861 | \$ | 15,000 | \$ | 15,270 | \$ | 15,545 | \$ 15,825 | \$ | 16,110 | \$ | 16,399 |
| Project Management | \$ | \$ - | \$ 128,497 | \$ | 130,810 | \$ | 133,165 | \$ | 135,562 | \$ | 138,002 | \$ | 140,486 | \$ | 143,014 | \$ 145,589 | \$ | 148,209 | \$ | 150,877 |
| Capitalized Overhead | \$ | \$ - | \$ 17,990 | \$ | 111,576 | \$ | 110,893 | \$ | 181,525 | \$ | 119,879 | \$ | 283,684 | \$ | 131,633 | \$ 202,017 | \$ | 150,905 | \$ | 131,345 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Costs |  | 0 | \$ 146,487 | \$ | 908,547 | \$ | 902,986 | \$ | 1,478,133 | \$ | 976,159 | \$ | 2,310,002 | \$ | 1,071,869 | \$ 1,644,994 | \$ | 1,228,796 | \$ | 1,069,525 |
| Avoided Cost | \$ | \$ | \$ $(146,487)$ | \$ | $(908,547)$ | \$ | $(902,986)$ | \$ | $(1,478,133)$ | \$ | $(976,159)$ | \$ | $(2,310,002)$ | \$ | $(1,071,869)$ | \$ (1,644,994) | \$ | $(1,228,796)$ | \$ | $(1,069,525)$ |


|  |  | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EM Meters to be Replaced |  | 5567 | 2734 | 5058 | 1296 | 1327 | 338 | 372 | 329 | 865 | 1450 |
| Electronic Meters to be Replaced |  | 674 | 284 | 310 | 0 | 0 | 0 | 0 | 0 | 0 | 1371 |
| Total Meters to be replaced |  | 6241 | 3018 | 5368 | 1296 | 1327 | 338 | 372 | 329 | 865 | 2821 |
| cost per Meter |  | 44.33 | 45.13 | 45.94 | 46.77 | 47.61 | 48.47 | 49.34 | 50.23 | 51.13 | 52.06 |
| New Meter Costs | \$ | 276,687 | \$ 136,208 | \$ 246,628 | \$ 60,615 | \$ 63,183 | \$ 16,383 | \$ 18,355 | \$ 16,526 | \$ 44,232 | \$ 146,848 |
| Replacement Labour Costs / Meter |  | \$126.30 | \$128.57 | \$130.89 | \$133.24 | \$135.64 | \$138.08 | \$140.57 | \$143.10 | \$145.68 | \$148.30 |
| Replacement Labour Costs | \$ | 788,238 | \$ 388,034 | \$ 702,605 | \$ 172,684 | \$ 179,997 | \$ 46,672 | \$ 52,292 | \$ 47,080 | \$ 126,009 | \$ 418,347 |
| Disposal Costs / Meter |  | \$2.48 | \$2.52 | \$2.57 | \$2.61 | \$2.66 | \$2.71 | \$2.76 | \$2.81 | \$2.86 | \$2.91 |
| Displosal Costs | \$ | 15,462 | \$ 7,612 | \$ 13,782 | \$ 3,387 | \$ 3,531 | \$ 916 | \$ 1,026 | \$ 923 | \$ 2,472 | 8,206 |
| BackOffice Costs / meter |  | \$2.86 | \$2.91 | \$2.97 | \$3.02 | \$3.07 | \$3.13 | \$3.18 | \$3.24 | \$3.30 | \$3.36 |
| BackOffice Costs | \$ | 17,858 | \$ 8,791 | \$ 15,918 | \$ 3,912 | \$ 4,078 | \$ 1,057 | \$ 1,185 | \$ 1,067 | \$ 2,855 | 9,478 |
| Contact Centre Call Volume increa | \$ | 5,397 | \$ 5,590 | \$ 5,690 | \$ 5,890 | \$ 5,996 | \$ 6,204 | \$ 6,316 | 6,534 | \$ 7,015 | \$ 7,235 |
| parallel meter accuracy checks | \$ | 16,695 | \$ 16,995 | \$ 17,301 | \$ 17,613 | \$ 17,930 | \$ 18,252 | \$ 18,581 | 18,915 | \$ 19,256 | 19,602 |
| Project Management | \$ | 153,593 | \$ 156,357 | \$ 159,172 | \$ 162,037 | \$ 164,954 | \$ 167,923 | \$ 170,945 | \$ 174,022 | \$ 177,155 | \$ 180,344 |
| Capitalized Overhead | \$ | 178,350 | \$ 100,742 | \$ 162,554 | \$ 59,659 | \$ 61,553 | \$ 36,037 | \$ 37,618 | \$ 37,109 | \$ 53,059 | \$ 110,608 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Total Costs | \$ | 1,452,280 | \$ 820,329 | \$ 1,323,650 | \$ 485,798 | \$ 501,221 | \$ 293,445 | \$ 306,318 | \$ 302,177 | \$ 432,052 | \$ 900,668 |
| Avoided Cost | \$ | $(1,452,280)$ | \$ $(820,329)$ | \$ (1,323,650) | \$ $(485,798)$ | \$ $(501,221)$ | \$ $(293,445)$ | \$ (306,318) | \$ $(302,177)$ | \$ $(432,052)$ | \$ $(900,668)$ |


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### 49.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.49.1 Response, p. 100; Exhibit B-6, BCUC IR 1.37.1 <br> Capital Costs

"FortisBC has one procurement contract for the proposed AMI project, with Itron, dated March 19, 2012 for approximately $\$ 21$ million." [Exhibit B-6, BCUC IR 1.37.1]
The response to BCUC IR 1.49 .1 provides a breakdown of the Project Contingency, Costs Subject to Fixed-Price or Fixed Unit-Price Basis and Costs Not Subject to FixedPrice or Fixed Unit-Price Basis. The following is an excerpt from Table BCUC IR 1.49.1.

| AMI Project Capital Cost Summary |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Item | Project Contingency | Costs Subject to Fixed-Price or FixedUnit price Basis | Costs Not Subject to Fixed-Price or Fixed Unit Price Basis | Total Costs |
|  | Total 2013-2015 |  |  |  |  |
|  |  |  |  |  |  |
| 1 | Third Party Software and Services | \$452 | \$5,378 | \$0 | \$ 5,830 |
| 2 | Meters (Including Deployment) | \$925 | \$18,812 | \$587 | \$ 20,323 |
| 3 | Network Infrastructure | \$660 | \$1,830 | \$1,959 | \$ 4,449 |
| 4 | System Integration | \$214 | \$0 | \$2,136 | \$ 2,349 |
| 5 | Theft Detection | \$100 | \$0 | \$1,000 | \$ 1,100 |
| 6 | Project Management | \$167 | \$0 | \$2,963 | \$ 3,130 |
| 7 | CPCN Approval Costs | \$0 | \$0 | \$4,915 | \$ 4,915 |
| 8 | Capitalized OH, AFUDC, PST | \$0 | \$0 | \$5,592 | \$ 5,592 |
| 9 | Total | \$2,516 | \$26,021 | \$19,152 | \$ 47,689 |
| 10 | Percentage of Total Cost | 5.3\% | 54.6\% | 40.2\% | 100.0\% |

49.1 Please provide the Project Contingency costs of $\$ 2,516$ thousand as a percentage of Costs Not Subject to Fixed-Price or Fixed-Unit Price Basis, excluding CPCN Approval Costs and Capitalized Overhead, AFUDC and PST. Please provide a copy of the calculation in a working excel document.

## Response:

Please see the table provided below, also provided as Electronic Attachment BCUC IR2 49.1:

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Table BCUC IR2 Q49.1.

| AMI Project Capital Cost Summary (\$000s) 2013-2015 |  |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
|  | Item | Costs Not Subject to <br> Fixed-Price or Fixed- <br> Unit Price Basis | Contingency (\$000) | Contingency <br> (\%) |
| 12 | Third Party Software and Services | $\$ 0$ | $\$ 0$ | $0.00 \%$ |
| 13 | Meters (Including Deployment) | $\$ 587$ | $\$ 44$ | $7.50 \%$ |
| 14 | Network Infrastructure | $\$ 1,959$ | $\$ 588$ | $30.00 \%$ |
| 15 | System Integration | $\$ 2,136$ | $\$ 214$ | $10.00 \%$ |
| 16 | Theft Detection | $\$ 1,000$ | $\$ 100$ | $10.00 \%$ |
| 17 | Project Management | $\$ 2,963$ | $\$ 167$ | $5.63 \%$ |
| 18 | CPCN Approval Costs | $\$ 4,915$ | $\$ 0$ | $0.00 \%$ |
| 19 | Capitalized OH, AFUDC, PST | $\$ 5,592$ | $\$ 0$ | $0.00 \%$ |
| 20 | Total | $\$ 19,152$ | $\$ 1,112$ | $\mathbf{5 . 8 1 \%}$ |
| 21 | Contingency Percentage of Total (less <br> Line 18 \& 19) |  | $\mathbf{1 2 . 8 6 \%}$ |  |

49.2 Please discuss why the "Costs Not Subject to Fixed-Price or Fixed-Unit Price Basis" of $\$ 26,021$ thousand exceeds the Itron contract cost of $\$ 21$ million.

## Response:

The $\$ 26,021$ represents "Costs Subject to Fixed-Price or Fixed-Unit price", and not the "Costs Not Subject to Fixed-Price or Fixed-Unit Price Basis" referenced by the question.

The Itron contract of $\$ 20.8$ million (rounded to $\$ 21$ million) price quoted does not include the fixed-unit costs associated with meter deployment sub-contract of approximately $\$ 5.3$ million.
49.2.1 Please provide a break-down of the $\$ 26,021$ thousand "Costs Not Subject to Fixed-Price or Fixed-Unit Price Basis" by vendor.

## Response:

Please refer to the response to BCUC IR No. 2 Q49.2.

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### 50.0 Reference: Project Description

## Exhibit B-11, BCPSO IR 1.55.1, BCSEA IR 1.68.1; Exhibit B-6-5, BCUC IR 1.97.2.1;

Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction"
Opt-Out Provision
"Fortis BC understands that Central Marine Power, which has one of the more established opt-out programs, has an opt-out rate of just over 1 percent of customers and that the rate is declining." [Exhibit B-11, BCPSO IR 1.55.1]
"Fortis BC believes that the "opt-out" customers should pay for the incremental costs and lost benefits related to their choice." [Exhibit B-11, BCSEA IR 1.68.1]
"The Company submits that the forecast theft reduction benefits results in both a reduction of FortisBC's annual revenue requirement and an increase in net billable load. The revenue requirement decrease is due to reduced power purchase expense related to marijuana grow operations being deterred from operating in FortisBC's service territory. Higher net billable load is due to more growers paying for their electricity as opposed to stealing electricity." [Exhibit B-6-5, BCUC IR 1.97.2.1, Revised Response]
50.1 Please provided a detailed schedule of forecast incremental costs and lost benefits of the proposed AMI project, assuming a 1 percent opt-out rate, for each year between 2013 and 2032. Please provide the detailed schedule in a working excel document.

## Response:

In answering this question, FortisBC has used the conditions and assumptions noted in the response to BCUC IR No. 2 Q50.2.

The following table is provided to recap the impacts implicit in the question:

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| :---: | :---: | :---: | :---: | :---: |
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Table BCUC IR2 50.1.a

|  | NPV (\$000) |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Costs \& Benefits | Application | 1\% Opt-out | Difference |  |
| Project Capital | 39,815 | 39,945 | 130 | ** |
| Sustaining Capital: |  |  |  |  |
| Meter Growth and Replacement | 1,717 | 1,717 | (0) |  |
| Handheld Replacement | (581) | (549) | 32 | ** |
| Measurement Canada Compliance | $(9,758)$ | $(9,758)$ | 0 |  |
| IT Hardware, Licencing, and Support Costs | 5,642 | 5,642 | (0) |  |
| Operating Expenses |  |  |  |  |
| New Operating Costs | 14,320 | 14,320 | 0 |  |
| Meter Reading | $(23,785)$ | $(22,753)$ | 1,032 | ** |
| Remote Disconnect/Reconnect | $(5,466)$ | $(5,334)$ | 132 | ** |
| Meter Exchanges | $(1,478)$ | $(1,478)$ | 0 |  |
| Contact Centre | (441) | (436) | 5 | ** |
| Theft Reduction |  |  |  |  |
| Theft Reduction | $(38,386)$ | $(38,386)$ | 0 |  |
|  |  |  |  |  |
| Notes: | ${ }^{*}$ recovered from | Opt-out cu | stomers |  |

3 Please see the Net AMI schedule below which factors in a 1 percent Opt Out rate. The

| FortisBC Inc. (FortisBC or the Company) | Submission Date: <br> Application for a Certificate of Public Convenience and Necessity <br> for the Advanced Metering Infrastructure Project | December 14, 2012 |
| :---: | :---: | :---: |

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Table BCUC IR2 50.1.b


| FortisBC Inc. (FortisBC or the Company) |  |  |  | Submission Date: <br> December 14, 2012 |
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| for the Advanced Metering Infrastructure Project |  |  |  |  |$\quad$| Response to British Columbia Utilities Commission (BCUC or the Commission) |
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50.2 Would Fortis BC consider pursuing the proposed AMI project with an opt-out provision? If yes, please discuss under what conditions Fortis BC would consider an opt-out provision acceptable, including, but not limited to:

- The maximum number of opt-outs that would be acceptable to Fortis $B C$.
- The conditions that would be required for a customer to opt-out.
- A detailed listing of the costs and lost benefits that "...customers should pay for."
- If customers electing to opt-out would require a new electromechanical, digital or other type of meter.


## Response:

FortisBC believes that an opt-out provision (or, for that matter, a "wired" AMI alternative) is not required. The evidence does not validate the health and environmental concerns related to "wireless" AMI meters expressed by a small proportion of the population. Nor does the evidence support the security concerns expressed by an even smaller proportion of the population.

Advanced meters are safe, as confirmed by health and science authorities including B.C.'s Provincial Health Officer, Health Canada and the World Health Organization. FortisBC AMI meters are well below Health Canada's exposure limits as well as being below the most rigorous precautionary standards in the world.

Nevertheless, FortisBC accepts that the BCUC has the authority to impose an opt-out provision as a condition of the approval of the CPCN.

Although FortisBC does not recommend providing customers with an "opt-out" option, it has considered the matter carefully and suggests the following principles if such an option was to be provided:

## The maximum number of opt-outs that would be acceptable to FortisBC

FortisBC cannot estimate a maximum number of opt-out customers that could be accommodated under the conditions outlined below, nor is it certain how such a maximum number could be utilized in a practical sense.

It is difficult to assess the negative impact on theft detection benefits at higher opt-out levels, although, presuming customers are required to have a "radio-off" AMI meter, the Company believes that at opt-out levels typically seen of between approximately $0.0-1.5 \%$, the benefit erosion would not be material. In the opt-out costing, below, FortisBC has assumed a $0.5 \%$
opt-out rate. Please see the response to BCUC IR No. 2 Q84.4 for an analysis of various optout rates.

From the November 2012 issue of Power Grid International:
In practice, the number of customers who opt out of smart meters - fewer than 1 percent - confirms that most customers support having a smart meter or at least do not oppose it.

Customers in Maine, the state with the highest level of press coverage regarding the issue, are most active, with some 1.4 percent of customers opting out (about 8,000 customers of the 600,000 total). Here are some others reported recently:

- Avista Corp: zero percent
- Florida Power \& Light Co.: 0.3 percent
- Lafayette Utilities System: 0.4 percent
- Pacific Gas \& Electric Co.: 0.5 percent
- Portland Gas \& Electric Co.: 0.0005 percent
- San Diego Gas \& Electric Co.: 0.05 percent

The average of these, including Maine, is 0.4 percent - about 1 in 250 customers.

## The conditions that would be required for a customer to opt-out

1. On request, customers would be provided with a standard AMI meter (the same as other customers), but with the meter's components that transmit data by radio turned off.
2. Meter readings and operational data would be downloaded manually bi-monthly from radio-off meters.
3. Radio-off customers bear the full incremental cost of the manual meter reading download process, including the labour, vehicles, incremental meter reading hardware and software.
4. Only a residential customer that is the FortisBC account holder associated with the meter can request a radio-off meter. Once the account holder terminates the service related to the meter, the meter will be reconfigured to "radio-on" operation.

## If customers electing to opt-out would require a new electro-mechanical, digital or other

 type of meterIt is important that "radio-off" AMI meters are deployed to help preserve advanced metering benefits and keep opt-out costs low (please also refer to the responses to CEC IR No. 1 Q50.5, BCPSO IR No. 2 Q16.1, and BCUC IR No. 2 Q84.4). This minimizes the cost to opt-out customers, who must bear the financial burden associated with the increased costs and
reduced benefits related to their choice. Cost increases and benefit reductions are minimized with a "radio-off" AMI meter for the following reasons:

1. Hourly meter readings are still obtained (but the data is available to the customer and the FortisBC less frequently). This helps substantially preserve the revenue protection benefits since energy balancing is still possible;
2. Fewer meter types needs to be inventoried and tracked throughout the service territory, saving money;
3. The cost of switching premises between "radio-on" and "radio-off" is minimized since the AMI meter does not have to be exchanged; and
4. Measurement Canada and meter exchange benefits are maintained.

A "radio-off" opt-out option would require BCUC approval of new terms and conditions and standard charges that would allow FortisBC to charge a one-time fee and a per-read charge to residential customers that have a radio-off meter installed at their premises at their request.

## A detailed listing of the costs and lost benefits that "...customers should pay for"

As described in the response to CEC IR No. 1 Q50.6:
On the above assumptions, the radio-off option fees would be:
A per-manual download fee of approximately $\$ 22$, assuming that $0.5 \%$ of customers elect the radio-off option. If more customers select radio-off, the per-download cost would be lower. If fewer customers select radio-off, the per-download cost would be higher.

A one-time fee of approximately $\$ 110$. This fee recovers incremental costs associated with:

- additional collectors and repeaters, as required, to ensure the integrity of the RF mesh network; and
- administrative costs associated with processing radio-off requests and maintaining an inventory of radio-off meters.

The one-time fee of $\$ 110$ includes the following work, which is required to initially reconfigure the AMI meter, communication infrastructure and software to accommodate a radio-off opt-out customer:

- An estimate of two hours per meter in administrative and IT work required for manual meter configuration within the AMI system; and
- An estimate of the average additional RF range extenders required (and the labour required to install them) to maintain the RF mesh.

The per-manual download fees of $\$ 22$ per bimonthly read has been estimated in a manner similar to that described in the response to CEC No. 141.1 which estimates the manual download cost for customers with AMI meters that cannot communicate due to the lack of an economic WAN option.

The radio-off opt-out fees include all labour, non-labour (such as time away costs, and travel expenses), handheld support, and vehicle expenses. The underlying assumptions are:

Read Time:
The actual "read" time (the time spent in front of the meter) would change from the existing average of approximately 1 minute per read to a new average read time of 3 minutes per read in order to accommodate the requirement to download interval data manually from the AMI meter.

Travel Time:
The significant variable is the travel time between reads. Given that the Company cannot determine the geographic dispersion of the impacted customer premises, it was first assumed that the reads were equally distributed over the Company's service territory. The service territory (in $\mathrm{km}^{2}$ ) was divided by the number of customers ( $0.5 \%$ of total customers) to determine an average distance between reads. Given an average travel speed between reads, this produced an average travel time for each read.

The Travel Time was added to the average "read" time of 3 minutes to determine an average total read + travel time for each manual read. To this result the hourly cost of manual meter reading was applied, resulting in a cost per read.

FortisBC has not added a 1.8 multiplier to the cost (as described further in the response to CEC No. 1 Q41.1 for the manual meter reading costs associated with a hypothetical analysis of 1\% and $5 \%$ of customers requiring manual meter reading due to the lack of an economic WAN option which includes an assumption that these meters would be located in remote hard to reach areas).
50.2.1 If the answer to the preceding IR is no, please explain why not.

## Response:

Please see the response to BCUC IR No. 2 Q50.2.

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50.3 In Fortis BC's opinion, would an opt-out provision reduce the "Theft Reduction" benefit of the proposed AMI project? Please discuss this in the context of the following individual elements of the Theft Reduction benefit:

- The reduction in the revenue requirement due to a decrease power purchase expenses related to marijuana grow operations under the proposed AMI project, as estimated by Fortis BC.
- An increase in net billable load under the proposed AMI project, due to more growers paying for their electricity as opposed to stealing electricity.


## Response:

Under the opt-out assumptions articulated in the responses to BCUC IR No. 2 Q50.2, in particular the requirement that opt-out customers receive a radio-off AMI meter and a $0.5 \$ \mathrm{opt}$ out rate, the impact to theft reduction is expected to be immaterial due to the Company's ability to still detect and deter theft which is related to:

- The reduction in the revenue requirement due to a decrease power purchase expenses related to marijuana grow operations under the proposed AMI project, as estimated by FortisBC.
- An increase in net billable load under the proposed AMI project, due to more growers paying for their electricity as opposed to stealing electricity.

Please also refer to the responses to BCUC IR No. 2 Q50.2, CEC IR No. 1 Q50.5 and BCPSO IR No. 2 Q16.1.
50.4 Please provide a revised "Theft Reduction" benefit calculation, assuming that 50 percent of total illegal, marijuana grow sites are able to "opt-out" of the proposed AMI project. Please provide the calculation in a working excel document, consistent with calculations provided in Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction".

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## Response:

Please refer to the response to BCUC IR No. 2 Q50.3. FortisBC does not expect a material theft reduction if the opt-out option described in the response to BCUC IR No. 2 Q50.2 is implemented. Illegal marijuana growers will not be incented to opt-out since the Company will still obtain the same information from the meters to allow energy balancing. Furthermore, opting-out would require that FortisBC continue to attend illegal marijuana growers' properties, further decreasing the likelihood that they will opt-out.

Should growers elect to opt-out, energy balancing will still be effective in detecting theft and therefore deterring theft.
50.4.1 Based on the calculations provided in the preceding IR, please provide the revised NPV of the "Theft Reduction" benefit under the proposed AMI project.

## Response:

The NPV of the proposed AMI project would not change. Please refer to the response to BCUC IR No. 2 Q50.4.

### 51.0 Reference: Project Costs and Benefits

Exhibit B-1 of the 2012-2013 Revenue Requirement and Review of ISP proceeding; Exhibit B-1-1, Excel Attachment, Tab "Net AMI" Line No. 5;

Exhibit B-6, BCUC IR 1.53.14.2
System Losses
Fortis BC submits in the response to BCUC IR 1.53.14.2 that "The Company has forecast loss reductions of 2 GWh associated with theft reduction due to AMI in its 2012 - 2013 Revenue Requirements Application." [Exhibit B-6, BCUC IR 1.53.14.2]

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| :--- |

Exhibit B-1 of the 2012-2013 Revenue Requirement and Review of ISP proceeding notes the following in Tab 3, p. $11^{2}$ :
"System losses consist of:

1. Losses in the transmission and distribution system;
2. Company use;
3. Losses due to wheeling through the BC Hydro system; and
4. Unaccounted-for energy (meter inaccuracies and theft)

Losses are calculated by using a two year rolling average. The actual gross loss rate for 2012 is the average of the 2009 rate of 9.23 percent and the 2010 rate of 8.42 percent, which is 8.82 percent. The loss rate for 2013 is further reduced to 8.76 percent due to the AMI-based loss reduction program."

Exhibit B-1-1 of the 2012-2013 Revenue Requirement and Review of ISP proceeding includes an ISP Consultation Report in Appendix K. Attachment 10 of Appendix K notes the following ${ }^{3}$ :

| 12. | • Will AMI cause a rate reduction? |
| :--- | :--- |
| 13. | • No, the cost for the program offsets the savings for a net sum zero <br> Customers with more energy use information. |

51.1 Please provide a breakdown of the estimated system losses for each year between 2013 and 2032, by the following individual categories:

1. Losses in the transmission and distribution system;
2. Company use;
3. Losses due to wheeling through the BC Hydro system; and
4. Unaccounted-for energy (meter inaccuracies and theft)
[^2]| FortisBC Inc. (FortisBC or the Company) <br> Application for a Certificate of Public Convenience and Necessity <br> for the Advanced Metering Infrastructure Project | Submission Date: <br> December 14, 2012 |
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|  | Type of System Loss | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
| :--- | :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  |  |  |  |  |  |  |  |  |  |  |
| 1 | Losses in the <br> transmission and <br> distribution system | 313 | 310 | 272 | 258 | 227 | $n / a$ | $n / a$ | $n / a$ | 1380 |
| 2 | Company use | 12 | 13 | 11 | 12 | 12 | $n / a$ | $n / a$ | $n / a$ | 61 |
| 3 | Losses due to wheeling <br> through the BC Hydro <br> system | 40 | 23 | 30 | 51 | 41 | $n / a$ | $n / a$ | $n / a$ | 183 |
| 4 | Unaccounted-for energy <br> (meter inaccuracies) | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | 0 |
| 5 | Unaccounted-for energy <br> (theft) | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | $n / a$ | 0 |
|  | Total | 364 | 346 | 313 | 321 | 280 | 306 | 309 | 310 | 2,549 |

The response to BCUC IR No 2 Q2.1 ${ }^{5}$, which followed up BCUC IR No. 1 Q2.1 above provided the following clarification:
"In the response to BCUC IR1 (Losses) Q2.1, FortisBC did not assume that unaccounted for energy plus meter inaccuracies equaled zero - the Company assumed

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that unaccounted for energy plus meter inaccuracies were included in the Line 1 (Losses in the transmission and distribution system)."
51.2 The excerpt from the 2012-2013 revenue requirement and ISP proceeding notes that "The loss rate for 2013 is further reduced to 8.76 percent due to the AMIbased loss reduction program." Please comment on whether or not the forecast revenue requirement, before the proposed AMI project, in Exhibit B-1-1, Excel Attachment, Tab "Net AMI" Line No. 5 includes system loss reductions due to the AMI project.

## Response:

The forecast revenue requirement in Exhibit B-1-1, Excel Attachment, Tab "Net AMI" Line No. 5 is the difference in revenue requirements between the Status Quo, without any loss reductions due to AMI, and the revenue requirements with AMI including system loss reductions due to the AMI project. Therefore, the forecast revenue requirement in Exhibit B-1-1, Excel Attachment, Tab "Net AMI" Line No. 5 includes system loss reductions due to the AMI project.
51.3 Please confirm if the forecast Revenue Requirement in Line No. 12 of Exhibit B-1-1, Excel Attachment, Tab "Net AMI" includes forecast loss reductions associated with theft reduction due to AMI.

## Response:

Line No. 12 of Exhibit B-1-1, Excel Attachment, Tab "Net AMI" does not include forecast loss reductions associated with theft reduction due to AMI.
51.3.1 If the answer is yes, please discuss if the Forecast Revenue Requirement on Line No. 12 of Exhibit B-1-1, Excel Attachment, Tab "Net AMI" already includes some of the Theft Reduction benefits calculated in Exhibit B-1-1, Excel Attachment, Tab "Theft Reduction".

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## Response:

Please refer to the response to BCUC IR No. 2 Q51.3.
51.3.2 If the answer is no, please confirm if the value of forecast loss reductions of 2 GWh in Fortis BC's 2012-2013 Revenue Requirement Application were added back to arrive at the forecast 2012 and 2013 Revenue Requirement per Line No. 12 of Exhibit B-1-1, Excel Attachment, Tab "Net AMI".

## Response:

The forecast AMI loss reductions of 2 GWh in Fortis BC's 2012-2013 Revenue Requirement Application were not included in the forecast 2012 and 2013 Revenue Requirement Line No. 12 of Exhibit B-1-1, Excel Attachment, Tab "Status Quo". The impact of the AMI loss reductions were included in the Gross AMI tab and the difference was presented in the Net AMI tab.
51.4 Please discuss the comment made Attachment 10 of Appendix K of the 2012 Integrated System Plan that AMI will not result in a rate reduction and "...the cost for the program offsets the savings for a net sum of zero."

## Response:

The 2012-2013 Integrated System Plan public consultation occurred in early 2011 during the early stages of business case development for the AMI project. At that time, the AMI benefits were not developed to a point where FortisBC could publicly state that they would be sufficient to more than offset the cost of the AMI project. From early 2011 to the filing of the Application in summer 2012, FortisBC continued to develop the probable Project benefit, producing the current forecast of costs and benefits as provided in the Application.

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### 52.0 Reference: Project Costs and Benefits <br> Exhibit B-6, BCUC IR 1.51.1 <br> AFUDC

"AFUDC for the project was calculated by applying the AFUDC rate to the average work-in-progress balance in each quarter from Q3 2013 up to and including Q3 2014." [Exhibit B-6, BCUC IR 1.51.1]
52.1 Please provide the detailed calculation of the forecast AFUDC of the proposed AMI project in a working excel document. Please include the average work-inprogress balance and the AFUDC rate used to calculate the AFUDC balance in each quarter from Q3 2013 up to and including Q3 2014.

## Response:

The detailed calculation can be found in Line 23 (Row 34) of the Gross AMI tab of the electronic model filed with the Commission as Exhibit B-1-1. The AFUDC rate is the after tax Weighted Average Cost of Capital. The calculation is as follows:

AFUDC Rate $=($ Equity Ratio $\times$ Return on Equity $)+($ Debt Ratio $\times$ Debt Rate $\times(1-$ Tax Rate $)$
e.g. 2014 AFUDC Rate $=(40 \% \times 9.9 \%)+(60 \% \times 5.98 \% \times(1-25 \%))$

$$
\begin{aligned}
& =(3.96 \%)+(2.69 \%) \\
& =6.65 \% \text { rounded to } 6.7 \%
\end{aligned}
$$

The average work-in-progress balance and the AFUDC rate used to calculate the AFUDC balance in each quarter from Q3 2013 up to and including Q3 2014 is provided below.

|  | 2013 |  |  |  | 2014 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Q3 |  | Q4 |  | Q1 |  | Q2 |  | Q3 |
| Average Work in Progress | \$ | \$ 1,695,254 | \$ | 8,504,244 |  | \$14,799,499 |  | \$17,274,425 |  | 21,249,352 |
| AFUDC Rate |  | 1.65\% |  | 1.65\% |  | 1.68\% |  | 1.68\% |  | 1.68\% |
| AFUDC | \$ | \$ 27,972 | \$ | 140,320 | \$ | 247,892 | \$ | 289,347 | \$ | 355,927 |


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52.2 Please confirm if the AFUDC rate for 2013 and 2014 is approved by Commission Order. If confirmed, please provide the reference for the Order. If not confirmed, please explain otherwise.

## Response:

Partly confirmed. The Company normally establishes its After Tax Weighted Average Cost of Capital and therefore its AFUDC rate in the determination of its revenue requirements in the test year(s). In the 2012 - 2013 RRA, the Company had forecast a 2013 AFUDC rate of 6.7 percent, however as a result of Commission Directives in Order G-110-12; the rate was revised to 6.6 percent. The rates for 2014 and beyond will be the subject of subsequent regulatory applications.

### 53.0 Reference: Project Costs and Benefits <br> Exhibit B-6, BCUC IR 1.51.1 <br> Capitalized Overhead

"Capitalized overhead was calculated by applying a capitalized overhead rate of 7 percent on the average capital expenditure in the year..." [Exhibit B-6, BCUC IR 1.51.3]
53.1 Please confirm if the Capitalized Overhead rate of 7 percent is approved by Commission Order. If confirmed, please provide the reference for the Order. If not confirmed, please explain otherwise.

## Response:

Not confirmed.
The Capitalized Overhead rate in any year is based on the forecast Revenue Requirements and Capital Expenditure Plan. Based on previous Commission approvals, and most recently by Order G-110-12, the Company calculates its Capitalized Overhead as 20 percent of its Gross Operating and Maintenance (O\&M) costs in the year. That amount is divided by the approved Capital Expenditure in the year to arrive at Capitalized Overhead rate to be applied to the capital expenditure in the year. The rate will vary year over year depending on Gross O\&M, the Capitalized Overhead rate (expressed as a percentage of Gross O\&M), and the level of Capital Expenditures, all of which are ultimately approved by the Commission.

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The Capitalized Overhead rate for 2013 was forecast to be about 14 percent. However, due the nature of the AMI project, where the majority of the project costs were of a turnkey nature, with limited Company resources employed to deliver the project, the Company decided that the project should only attract half of the capitalized overhead rate or about 7 percent.

### 54.0 Reference: Project Costs and Benefits

## Exhibit B-6, BCUC IR 1.51.1

## PST

54.1 For each of 2013, 2014 and 2015, please provide the total costs under the proposed AMI project that are subject to PST.

## Response:

Please see the following table:
Table BCUC IR2 Q54.1

|  | 2013 | 2014 | 2015 |
| ---: | ---: | ---: | ---: |
| Total Costs $\$(000)$ | $\$ 2,673$ | $\$ 8,957$ | $\$ 10,996$ |
| PST | $\$ 187$ | $\$ 627$ | $\$ 770$ |
|  | $\$ 0$ Total | $\$ 2,860$ | $\$ 9,584$ |
|  |  | $\$ 11,766$ |  |

### 55.0 Reference: Health and Safety - EMR-Related Health Concerns

FortisBC states on page 7 of its application, "Health - some stakeholders have expressed concerns regarding the health effects associated with a wireless RF AMI network. FortisBC submits that the proposed AMI technology complies with Health Canada's Safety Code 6 as further detailed in Section 8.4.2. As such, FortisBC submits that its proposed AMI Project does not present any risk to customers' health or safety."

In addition, on Page 32 of the Exponent report (Appendix C-5), Fortis states, "Knowledge about the existence of RF energy sources such as a base station facility is a source of reporting bias, particularly if a person holds the opinion that such exposures contribute to his or her symptoms."
55.1 Does FortisBC consider the 'nocebo effect', as referenced in the Exponent report and in other academic studies of the potential link between RF/EMF radiation and human health, to be a significant source of negative effects for some of these concerned stakeholders? If not, please explain why not.

## Response:

Yes. Scientific research on radiofrequency fields and assessments of this research by health and scientific agencies has described the belief and perception of some individuals that they can detect or develop symptoms in the presence of these fields as unrelated to the physical stimulus itself (referred to as electromagnetic hypersensitivity). As stated by the World Health Organization "The symptoms are certainly real and can vary widely in their severity. Whatever its cause, EHS can be a disabling problem for the affected individual. EHS has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF exposure." (http://www.who.int/peh-emf/publications/facts/fs296/en/index.html)

Please also refer to the response to BC Hydro IR No. 2 Q2.6.1.
55.1.1 Has FortisBC weighed the costs of providing some level of simple EMF shielding or other mitigation methods for its customers as a way of dealing with perception-based negative health effects?

## Response:

FortisBC has not evaluated shielding or other mitigation methods to address perceptions of some persons that exposure to radiofrequency signals from AMI meters might produce negative health effects, or the costs of methods. The metal back plate of a meter already significantly attenuates the RF signal within the residence. Please refer to the response to BC Hydro IR No. 2 Q2.10.1. As advised by the WHO, "Treatment of affected individuals should focus on the health symptoms and the clinical picture, and not on the person's perceived need for reducing or eliminating EMF in the workplace or home."

Furthermore, research on the perception of risks of radiofrequency fields of mobile phones conducted on behalf of the Department of Health in the United Kingdom provides qualitative and

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quantitative evidence that precautionary recommendations increase not decrease public concern, ${ }^{6,7}$ a finding supported by other research as well. ${ }^{8,9}$

One of the studies cited above ${ }^{3}$ concluded:
The results of the two experiments support the warnings in the WHO background document (WHO 2000) on cautionary policies "that such policies be adopted only under the condition that scientific assessments of risk and science-based exposure limits should not be undermined by the adoption of arbitrary cautionary approaches." We tend to add that any precautionary policy should consider possible countervailing risks such as increasing fear and unnecessarily spreading anxieties. These adverse impacts of precaution should be brought to the attention of policy makers.

A very recent assessment of the potential health risks of low-level radiofrequency fields by an Expert Committee convened by the Norwegian Institute of Public Health to advise the Ministry of Health and Care Services and the Ministry of Transport and Communications ${ }^{10}$ concluded:

The current regulations are based on the ICNIRP reference values for maximum exposure. The Expert Committee does not recommend special measures to reduce exposure, e.g., by changing the threshold limit values. The knowledge base in this health risk assessment provides no reason to assert that adverse health effects will occur from the typical public exposure. This also applies to the use of wireless communications in the office environment.

The mandate also asks the Committee to consider whether uncertainties are revealed that require the application of the precautionary principle when managing the risk and, if so, how the precautionary principle should be applied.

The Committee has therefore thoroughly discussed whether there are grounds to apply the precautionary principle for weak RF fields. The Committee considers that the conditions for applying the principle have not been met. Furthermore, the Committee considers that the administrative authorities can select a precautionary strategy according to the lowest level, i.e. "any exposure should not be higher than needed for the intended purpose to be achieved".

[^4]Regarding persons with health problems attributed to electromagnetic fields, the Committee concluded:

The Committee believes that there is no need to revise radiation protection legislation for individuals who attribute their health problems to electromagnetic field exposure. It is scientifically improbable that the reduction of exposure to electromagnetic fields is significant for health problems attributed to electromagnetic fields. The Committee therefore believes that there is no basis to recommend measures aiming to reduce exposure to electromagnetic fields for individuals with health problems attributed to electromagnetic fields. The health service and other parties should instead encourage the reduction of avoidance behaviour and discourage implementation of measures for which there is no scientific basis. However, it is always important to respect individuals and their choices.

### 56.0 Reference: Privacy

## Exhibit B-9, Attachment 2

 FortisBC Privacy Policy"When we wish to use or disclose the Personal Information for a new purpose, we will identify the new purpose prior to such use or disclosure and obtain consent at that time, unless such use or disclosure without consent is permitted or required by law." (p. 2 of 6, FortisBC Privacy Policy)
56.1 Does FortisBC receive written acceptance from customers for the use of personal information? If not, why not.
"From time to time, we may store your Personal Information outside of Canada, where it may be subject to the lawful access requirements of the jurisdiction in which it is being held." (p. 5 of 6, FortisBC Privacy Policy)

## Response:

FortisBC does not require that customers provide written consent for the use of their personal information as written consent is not a requirement under the Personal Information Protection Act. FortisBC has a Privacy Policy which explains the purposes for which FortisBC collects, uses and discloses their personal information and by accepting service from FortisBC a customer consents to the collection, use and disclosure of their personal information for those purposes.

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56.2 For what purpose and under what circumstances would FortisBC store Personal Information of its British Columbia customers outside of Canada?

## Response:

Any personal information from the AMI system will not be not sent or stored outside of Canada and will reside on FortisBC's servers located within British Columbia.
56.3 What would the business implications be to FortisBC if this provision were removed from the FortisBC Privacy Policy in order to maintain British Columbia resident Personal Information within British Columbia or Canadian jurisdiction?

## Response:

Pursuant to the Personal Information Protection Act, FortisBC is required to notify customers of the purposes for which it collects, uses and discloses their personal information (these purposes are listed in the FortisBC Privacy Policy). The Personal Information Protection Act also requires that if an organization is going to collect, use or disclose that information for a purpose other than those that the customer is already aware of they must obtain consent from the customer to do so (unless collection, use and disclosure is permitted without consent under the Personal Information Protection Act). The legislative requirements under the Personal Information Protection Act are why FortisBC includes this statement in its Privacy Policy.

### 57.0 Reference: Project Alternatives

Exhibit B-6, BCUC IR 1.106.1
Communications
The FortisBC response to BCUC IR 1.106.1notes the following:

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"In fact, the negotiated AMI contract allows Itron to propose and/or substitute alternative, functionally-similar LAN solutions (such as PLC or direct cellular connection) where they are more economic than the main RF solution."
57.1 Has FortisBC reserved the right to approve any "functionally similar" substitutions?

## Response:

Yes, FortisBC has reserved the right to approve any "functionally similar" substitutions.
57.2 In the event of a "more economic" substitution, are all savings to the benefit of FortisBC customers or would some or any of the economic savings be retained by Itron?

## Response:

All savings related to a "more economic" substitution are to the benefit of FortisBC customers.

> 57.3 Please confirm whether Itron has PLC or direct cellular connection meter technologies commercially available.

## Response:

Yes, Itron is a provider of direct cellular connection metering.
As noted in the response to BCUC IR No. 2 Q32.2, Itron currently does not manufacture PLC equipped meters that are suitable for use in North America due to the relatively small PLC market share.

### 58.0 Reference: Health and Safety - Marijuana Grow Operations <br> CPCN Guidelines, Appendix A; Clean Energy Act, Section 2; Exhibit B-6, BCUC IR 1.78.2 <br> Evaluation framework <br> Appendix A of the 2010 Certificates of Public Convenience and Necessity Application Guidelines ${ }^{11}$ states that an application under sections 45 and 46 of the UCA should contain: <br> " 2 (ii) A comparison of the costs, benefits and associated risks of the project and feasible alternatives, including estimates of the value of all of the costs and benefits of each option or, where these costs and benefits are not quantifiable, identification of the cost or benefit that cannot be quantified." <br> Section 2 of the Clean Energy Act includes as a British Columbia energy objective "to encourage economic development and the creation and retention of jobs." <br> FortisBC stated in BCUC IR 1.78.2 "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." <br> 58.1 Does FortisBC consider that Section 2 of the CEA considered illegal activities as the type of economic development that should be encouraged in BC? If yes, please explain why.

## Response:

FortisBC doubts that Section 2 of the Clean Energy Act was intended to encourage economic development through illegal activities.
58.2 Does FortisBC consider that it is legal and/or ethical for a company to knowingly profit (or allow its customers to profit) from the illegal activities of other customers? Please explain why/why not.

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## Response:

FortisBC does not expect to profit from the illegal activities of its customers. FortisBC customers are however expected to benefit from lower rates, fewer overall grow operations and improved safety as a result of implementing the AMI project and discouraging the theft of electricity.
58.2.1 Does FortisBC consider that no financial benefit (in terms of lower bills to ratepayers) should be included in CPCN net benefits calculation where this benefit only occurs as a result of an increase in sales to illegal activities? Please explain why/why not.

## Response:

If the AMI project is implemented as proposed real financial benefits will occur due to illegal marijuana grow operations being incented to pay for their electricity. It would seem disingenuous and improper not to attribute those financial benefits to the capital investment from which they are derived. In addition, the Company is not aware of any authoritative texts or guidelines for preparing financial analyses that suggest cash flows or other financial consequences of illegal activities are to be ignored when performing an analysis.
58.3 Does FortisBC consider that negative financial effects on illegal marijuana grow operators (whether paying or not paying) should not be a consideration in the AMI evaluation, however, negative health and safety effects on these consumers can be a consideration? Please explain why/why not.

## Response:

FortisBC believes that all customers should pay for the electricity they use in accordance with the FortisBC Electric Tariff No. 2. Financial hardship to customers caused by the fair and equitable application of the Tariff should not be a consideration in the AMI evaluation.

The health and safety benefits resulting from the AMI project are attributable to all customers, and should form part of the evaluation.

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FortisBC does not consider there to be any negative health and safety effects from the AMI project that need to be considered. If there were, they should be considered for any customer affected.
58.4 Does FortisBC consider that broader BC social impacts related to the AMI option (for example, any expected affect on organized crime) can be a consideration in the evaluation, even if they affect residents who are not FortisBC customers? Please explain why/why not.

## Response:

FortisBC understands that consideration of the public interest is broad. Certain social impacts may fall within the scope of that consideration. Whether an effect on organized crime would be expected, its nature if expected or its bearing would depend on the particular facts.
58.5 Does FortisBC consider that effects outside of BC (such as a shift of illegal activities to other Provinces) should be considered out of the scope of an AMI evaluation? Please explain why/why not.

## Response:

FortisBC understands that consideration of the public interest is broad. Certain effects that cross provincial borders may be within the scope and others not, depending on the particular facts.
58.6 Does FortisBC consider that, for the purposes of the AMI cost/benefit evaluation, the key considerations related to marijuana grow-operations are listed below? Please explain why/why not:

- Health and safety: community health and safety issues associated with a higher number of illegal grow-ops under the status quo than under the AMI proposal.
- Financial: financial benefits resulting from a reduction in network losses through better identification of electricity theft. Any negative

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financial impacts on rates resulting from a reduction in electricity sales to illegal activities would be excluded from the evaluation.

## Response:

FortisBC does consider both health and safety impacts as well as financial ones are key considerations related to marijuana production sites for the purposes of the AMI cost/benefit evaluation. From a health and safety perspective the risk of electrical fires notably associated with theft sites is of particular concern to the Company.

FortisBC does not agree that any negative financial impacts on rates resulting from a reduction in electricity sales to illegal activities would be excluded from the evaluation. Marijuana production is not the only illegal business which consumes electricity and the Company has very little visibility of the legality of purpose for which customers use electricity. Financial impacts related to electricity sales are not excluded for any other customer end use when performing financial analysis and the Company submits that all rate impacts whether positive or negative should be accurately reflected in the AMI proposal independent of the activities which generate the sales.

### 59.0 Reference: Health and Safety - Marijuana Grow Operations

Exhibit B-1, Tab 5, Section 5.3.2, pp. 80, 81; Exhibit B-6, BCUC IR 1.86.1, Appendix 1, p. 8; City of Abbotsford, A Community Public Safety Initiative - Removing Marijuana Grow Op Hazards in the City of Abbotsford, 2005, p. 4; Plecas, Diplock \& Garis, Commercially viable indoor marihuana growing operations: what makes them such a serious issue; pp 8-26

Problem description
FortisBC states on page 80 and 81 of its Application:
"Energy theft is a serious concern for FortisBC and its customers for safety and financial reasons. Premises where theft is occurring have been altered without the certification required under the Safety Standards Act. Many of these service alterations impose fire hazards and other risks on unknowing neighbours, first responders and electric utility workers."

In the Appendix to BCUC IR 1.86.1, page 8, Professor Boyd states:
"Finally, I note that the material provided to me by Fortis does not quantify the potential public safety benefit of AMI (in relation to the dangers inherent in theft of electricity). More specifically, the avoidance and/or limitation of fatalities and serious injuries to citizens have economic costs that should be considered."

Appendix 2 to this IR (see Attachment Panel) is an October 2005 report by the City of Abbotsford titled 'A Community Public Safety Initiative - Removing Marijuana Grow Op Hazards in the City of Abbotsford'. ${ }^{12}$ Page 4 of this report states:

## Community Public Safety Concerns

Two public forums were held to allow the citizens of Abbotsford to voice their concerns about Grow Ops in their neighbourhoods and how they were affected. It was clear the citizens of Abbotsford were concerned for their safety, the safety of their children, and the safety of their neighbourhoods. In particular, citizens identified the following concerns:

- there is potential for fire to spread to neighbouring properties due to electrical bypasses or over-stress on electrical systems;
- growers often have children living with them in houses with Grow Ops;
- mould and carbon monoxide poisoning can be present in Grow Op houses;
- the electrical work is generally not done by a qualified electrician and not in compliance with the Provincial Safety Standards Act;
- Building Code infractions are present within Grow Op houses;
- Grow Rips occur in otherwise crime-free neighbourhoods; this can result in neighbourhood children and innocent citizens being harmed;
- there is a real fear that houses are sold to purchasers without their knowledge that safety issues exist;
- there is general neglect of a house that contains a Grow Op, which affects the overall neighbourhood.

Appendix 3 to this IR (see Attachment Panel) is a Plecas, Diplock \& Garis report titled 'Commercially viable indoor marihuana growing operations in British Columbia: what makes them such a serious issue?" ${ }^{13}$ This report states:
"Because indoor marihuana grow ops require a great deal of electricity to power the typically 1000 watt bulbs used to provide the plants with light, these operations are susceptible to serious electrical hazards including fire. ... Of particular concern is that the previously discussed dangers such as high humidity, increased $\mathrm{CO}_{2}$ levels, high energy light systems, and improper and unregulated construction and electrical work

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make marihuana grow sites much more hazardous to children than a typical home." (Page 8)
"These dangers are not limited to only the grow operators, but pose a serious threat to neighbours and first responders. Contamination from the chemicals used in the growing process is a major health concern for people in neighbouring properties. According to the focus group (Surrey Fire Service focus group, July 10, 2009), there is a real risk of drinking water contamination in the neighbourhood as a result of back flushing. Also, the spilling and dumping of chemicals can result in the migration of substances into neighbouring properties, which would require remediation to eliminate the danger." (Pages 8, 9)
"In addition to the health risks identified above, there is also the potential for marihuana production to cause social problems to communities. These problems include attracting and supporting criminal activity, lowering property values, increasing living costs, and impacting the environment. These problems may be of most concern for those living within close proximity to marihuana growing operations, but the negative effects of marihuana production influence all British Columbians." (Page 9)
"In addition to the potential for home invasions and other violence to increase as a result of the drug trade, the presence of marihuana growing operations also offers an avenue for young people to become involved in criminal activity. This is especially true for children who are raised in residences housing grow ops, since they are exposed to a lifestyle that includes illegal activities." (Page 10)
"If the large majority of grow ops go on undetected, this implies that there may be many contaminated residences that used to be former growing operations. ... Even for those who do manage to avoid living near or buying a home that used to house an indoor marihuana growing operation, there are economic and environmental costs that affect everyone. One such example may be in the housing market, where home buyers are competing with prospective marihuana growers to purchase property. Not only are drug producers damaging and devaluing homes for future owners, but they may also be driving up the costs with the demand for new drug production sites." (Page 11)
"[Commercially viable indoor marihuana growing operations] are harmful operations intended to generate on-going tax free profits for those who own them. Collectively across the province of British Columbia commercial marihuana growers take money out of the pockets of every taxpayer and worse and increasingly so, facilitate the ability of organized crime to become richer, stronger, and more pervasive." (Page 26)
59.1 Does FortisBC consider that illegal grow operations have the following negative health and safety impacts on its customers and for $B C$ in general? If no, please explain why not.

> - Attracting and supporting criminal activities

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- Increased fire risk
- 

Property damage which may not be disclosed to home purchasers
Drinking water contamination

- Health and safety concerns for occupiers of grow-op buildings, which may include children.


## Response:

The negative health and safety impacts of commercial indoor marijuana sites for FortisBC customers and the general public of BC are well documented by numerous authorities on the matter. The Company does consider these concerns to be valid.
59.2 Has FortisBC consulted with its customers and the broader community in order to better understand both the size of the illegal marijuana grow-operation on its network, and the health and safety implications of these illegal operations on its customers and the broader BC community? If no, please explain why not. If yes, please explain the consultation undertaken and the result.

## Response:

FortisBC has not consulted directly with its customers and the broader community generally on the nature and size of illegal marijuana production sites. Criminal activity, property damage, drinking water contamination and health impacts of building occupancy both generally and specific to marijuana production is beyond the scope and expertise of the Company. It would not be appropriate for FortisBC to initiate a dialogue with customers on subjects where it has no authority or knowledge.

The Company is not indifferent to the concerns raised about the health and safety impacts related to marijuana production and is particularly concerned about the increased fire risk they present. Customers have been informed of these risks by way of a bill insert and have been encouraged to report any suspicion of energy theft directly to the utility. Energy theft complaints are taken seriously and investigated. Sites which are found in violation of the Electric Code are disconnected until the service is restored. Suspicions of criminal activity and other concerns should be reported to the appropriate authorities who are empowered to respond.

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### 60.0 Reference: Health and Safety - Marijuana Grow Operations

## Exhibit B-6, BCUC IR 1.86.1, Appendix 1, pp. 3-7

## AMI impact

In Appendix to BCUC IR 1.86.1, Professor Boyd states:
"If no more than 5 per cent of growers are stealing - because the risks of detection and arrest are simply overwhelming - then it follows that there may not be any increase in marijuana grows in the Fortis region, but perhaps even a decrease in the number of sites, contrary to the projections made by the company." (Page 7)
"Public opinion polls in Canada demonstrate significant support for the decriminalization of possession, and for some degree of regulation of the industry." (Pages 3, 4)
"If FortisBC was to resist AMI deployment and local governments in the region were to simultaneously embrace the [Safety Standards Amendment] Act of 2006, a worst case scenario seems likely to emerge. The number of growers in the region would increase, given knowledge of the lack of AMI deployment, and the majority would steal electricity, knowing that their high levels of consumption would be reported by Fortis to local governments, and, in turn, to police." (Page 6)
60.1 Please confirm the following:

- under the Probable AMI forecast, FortisBC conservatively projects that the number of illegal marijuana sites will increase at 1 percent annually, compared to the status quo of 2 percent annually
- under the Potential AMI forecast, FortisBC projects that the number of illegal marijuana sites will increase at 1 percent annually, compared to the status quo of 3 percent for the first five years (2 percent annually thereafter).


## Response:

Confirmed.

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60.2 Please respond to Professor Boyd's comments that AMI may result in a more significant decrease in the number of illegal marijuana sites (rather than just a smaller annual increase).

## Response:

Please see the responses to BCUC IR No. 1 Q87.2 and BCUC IR No. 2 Q62.3.
60.3 Please describe the health and safety impacts on BC residents related to a projected reduction in the number of illegal marijuana grow-operations from the FortisBC AMI proposal.

## Response:

To the extent that there is a decline in both the number of overall sites and the number of theft sites under AMI relative to the Status Quo, the published health and safety impacts as noted by the Commission in BCUC IR No. 2 Q59.2 will be reduced.
60.4 Does FortisBC consider that AMI could increase the ability of local governments to use the Safety Standards Amendment Act of 2006 to address illegal marijuana grow operation concerns in their areas? If yes, please describe and state if this could result in any additional health and safety benefits for $B C$ residents.

## Response:

The 2006 Amendment to the Safety Standards Act empowered municipalities to request available electricity consumption information for accounts consuming in excess of 93 kWhs per day in the most recent billing period to the request and for the previous 24 months. As AMI meters will record hourly consumption data versus cumulative 60 day information the utility will have more granular consumption data available. However, this additional detail will not necessarily increase the ability of municipal governments to address illegal marijuana production sites.

While a reduction of illegal marijuana sites within municipal boundaries where safety focussed initiatives are specifically in place may increase health and safety benefits for the residents of

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that municipality, BC residents in general may not benefit as producers may simply move operations to another municipality where there is no such program or they may switch to theft of alternate energy sources which will increase health and safety risks for BC residents.
60.4.1 Please describe whether, and to what extent, legalization of marijuana could reduce the expected health and safety benefits associated with a decrease in the number of illegal marijuana grow operations under the AMI proposal.

## Response:

To the extent that the number of illegal marijuana production sites decrease (increase) with industry regulation there will be a corresponding increase (decrease) in the expected health and safety benefits under the AMI proposal. A number of different scenarios may develop and it is difficult to predict with any certainty the impact of changes in BC regulation on health and safety benefits for FortisBC customers.

Additionally, many of the health and safety risks cited by the Commission in BCUC IR No. 2 Q59.1 are the responsibility of other jurisdictions and it is difficult to predict how these concerns might be addressed for legal operations under regulation.
60.4.2 Does FortisBC consider that, in evaluating the AMI proposal, health and safety benefit estimates related to a reduction in the number of illegal marijuana grow operations should be (i) reduced to reflect the risk of legalization of marijuana at some point during the project term and/or (ii) increased to reflect an increase in ability by local governments to address illegal marijuana grow operations? If no, please explain why not. If yes, please explain to what extent estimated benefits should be reduced/increased to reflect these factors.

## Response:

FortisBC does not consider that, in evaluating the AMI proposal, health and safety benefit estimates related to a reduction in the number of illegal marijuana grow operations should be:

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i. reduced to reflect the risk of legalization of marijuana at some point during the project term; and/or
ii. increased to reflect an increase in ability by local governments to address illegal marijuana grow operations

Please see the responses to BCUC IR No. 2 Q63.1, Q60.4 and Q64.1.
60.5 To what extent would allowing individual customers to opt out of AMI affect the ability of FortisBC to achieve health and safety benefits related to a reduction in the number of illegal marijuana grow operations? Please explain and quantify where possible.

## Response:

Assuming that an opt-out program is implemented in the manner described in the response to BCUC IR No. 2 Q50.2, FortisBC does not anticipate that allowing individual customers to opt out of AMI will materially affect the health and safety benefits related to a reduction in the number of illegal marijuana production sites. Please also refer to the responses to BCUC IR No. 2 Q50.4 and BCUC IR No. 2 Q60.3.

### 61.0 Reference: Electricity Theft - Marijuana Grow Operations

Exhibit B-6, BCUC IR 1.81.2, 1.81.3; Order G-3-12, pp. 37-39 Cost of Energy
FortisBC, in BCUC IR 1.81.2, states "Marginal Cost [for Theft Reduction] is the incremental power purchase expense per MWh based on the BC Wholesale Market Energy Price ( $\$ 54.68$ per MWh for 2012).

FortisBC, in BCUC IR 1.81.3states "All power purchase costs are based on the BC Wholesale Market Energy Price Forecast. FortisBC considers these revenue and cost rate forecasts to be reasonable and as such did not consider other alternatives."

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Commission 2012 Order G-3-12 on FortisBC Inc. Residential Inclining Block Rate states on pages 37 to 39 : ${ }^{14}$
"The following table summarizes FortisBC's various marginal cost and LRMC values presented throughout this Application.

Table 3: FortisBC's Marginal Cost and Long-Run Marginal Cost of Energy

| Definition | Value | Reference |
| :--- | :--- | :--- |
| Marginal Cost: short-term <br> avoided costs over the 2012 to <br> 2015 period, based primarily on <br> avoided 3808 Energy Purchases <br> with minor amount of market <br> purchases and surplus sales) | $\$ 38.04$ per MWh | Exhibit B-8, Commission Panel IR 7.1 |
| Long-Run Marginal Cost: cost to <br> acquire additional power through <br> market purchases where existing <br> resources are insufficient to meet <br> load requirements | $\$ 84.94$ per MWh | Exhibit B-8, Commission Panel IR 7.2 |

... In the 2008 BC Hydro Residential Inclining Block (RIB) Decision, the Commission determined that the long-run cost of new supply is the appropriate referent for the Step-2 energy rate (BC Hydro 2008 RIB Decision, p. 107, Order G-124-08). The Panel finds that no new evidence has been provided in this proceeding to cause it to depart from those conclusions. Accordingly, the Commission Panel determines that the longrun marginal cost of new supply continues to be the appropriate referent for the Block-2 energy rate. ...

While the Panel considers the most appropriate referent to be the cost of acquiring energy through new resources, we note that all of the above marginal costs represent only the cost of acquiring the energy. Thus, there is ambiguity between the LMRC as defined by FortisBC and the true long-run marginal cost of new supply to the customer. The Block 2 rate is a delivered rate, while the LRMC is a cost of acquisition - it only relates to the cost of procuring energy but does not include the LRMC of transporting that energy to customers through transmission and distribution networks. FortisBC estimates the LRMC at $\$ 125.80$ per MWh, or 12.58 cents per kWh, which includes line losses of 11 percent, but does not include other delivery costs. ...

Because of the uncertainty of the actual LRMC, the Panel does not agree that the Block 2 rate be capped at this time. However, FortisBC is directed to provide an update of the full long-run marginal cost of acquiring energy from new resources, including the cost to transport and distribute that energy to the customer as part of the reporting to be submitted in 2014."

[^7]61.1 Please provide FortisBC's estimate of the long-run marginal cost of acquiring energy from new resources, including the cost to transport and distribute that energy to residential customers (consistent with that requested on page 41 of Commission Order G-3-12). Please state all assumptions used in arriving at this estimate, including those for transmission and distribution line losses, ancillary services, and incremental network costs.

## Response:

As illustrated in the table provided in BCUC IR No. 2 Q61.0, FortisBC's LRMC for acquisition of new resources is $\$ 111.96 / \mathrm{MWh}$. Adding $11 \%$ FortisBC system losses increases that LRMC to $\$ 125.80 / \mathrm{MWh}$. FortisBC does not currently have the information to forecast the cost to transport and distribute that energy to residential customers, and convert it to a meaningful levelized per unit cost of delivery. As directed on page 41 of Commission Order G-3-12, FortisBC is working to develop this information so that it can include the full long-run marginal cost as part of the reporting to be submitted in 2014.
61.2 Please explain why FortisBC has used a short-term avoided cost of energy in its analysis on Table 5.3.2.b and 5.3.2.c of the Application, rather than the long-run marginal cost of acquiring energy from new resources determined to be the appropriate referent price by the Commission for the residential Block-2 energy rate.

## Response:

In keeping with the overall conservative approach to determining the benefits associated with AMI implementation, the Company selected the lower, short-run value as the more conservative estimate for the cost of energy. Using the higher long-run value would result in an increase in the overall project benefit.
61.2.1 Does FortisBC object to using the full long-run marginal cost of acquiring energy from new resources (determined to be the appropriate referent price by the Commission for the residential Block2 energy rate) to estimate the cost of energy theft by marijuana grow operations and the revenue requirement impact of a change in the

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number of paying illegal marijuana grow-operations on its network? If yes, please explain why.

## Response:

FortisBC would not object, however as noted in the response to BCUC IR No. 2 Q61.2, the Company elected to use the short-term avoided cost as part of the overall conservative approach to modelling the benefits associated with the AMI Application, and believes this to be an appropriate approach. FortisBC notes that using the BC New Resource Market Energy Forecast including transportation and distribution costs estimated at 11 percent increases the NPV of the theft reduction benefit to $\$ 42.1$ million. This improves the economics of the project to $\$ 22.3$ million. Please refer to Electronic Attachment BCUC IR2 61.2.1.

### 62.0 Reference: Electricity Theft - Marijuana Grow Operations

## Exhibit B-6, BCUC IR 1.86.1, Appendix 1, BCUC IR 1.87.1, BCUC IR

 1.85.4.1;Exhibit B-1, Tab 5, Section 5, p. 69, Section 5.3.2, pp. 81-87
Benefit quantification
FortisBC includes as an Appendix to BCUC IR 1.86.1 a June 24, 2012 letter by Neil Boyd, Professor School of Criminology, Simon Fraser University which provides a written opinion with respect to the potential and probable impacts of AMI deployment within the geographic area served by FortisBC.

FortisBC states on page 69 of the application "The summary table below displays the savings to FortisBC customers between 2015 and 2030 and calculates the net present value of those savings in 2012 dollars."

FortisBC includes on page 81 to 87 of the Application, and in response to BCUC IR 1.87.1, its assumptions in calculating the NPV of net benefit to customers related to illegal marijuana grow operations for the Probable and Potential AMI forecast.
FortisBC includes a table in response to BCUC IR 1.85.4.1 which shows that, from 2006 to 2011, $\$ 355,086$ was collected as a result of back-billing for electricity theft out of a total invoiced amount of $\$ 714,411$. FortisBC states that approximately $98 \%$ of this amount is related to marijuana grow operations.
62.1 Please provide the resume of Professor Neil Boyd.

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## Response:

A resume provided to FortisBC by Professor Boyd is provided as Appendix BCUC IR2 62.1.
62.1.1 Please confirm that "11,400 kWh per site ( $3,780 \times 30$ lights)" on page 3 of Professor Boyd's report should read "113,400 kWh per site (3,780 X 30 lights)". If no, please explain why.

## Response:

The correction in this calculation has been confirmed with Professor Boyd.
62.2 Does FortisBC consider that the table below is a reasonable summary of the key assumptions made by FortisBC in estimating electricity theft by illegal marijuana grow operations, and Professor Boyd's expert opinion on that evidence. If no, please clarify.

|  | FortisBC <br> Status Quo | FortisBC AMI <br> Probable | FortisBC AMI <br> Potential | Prof. Boyd |
| :--- | :--- | :--- | :--- | :--- |
| Number of illegal <br> marijuana sites in <br> Fortis BC service <br> area | 824 | 824 | 824 | 820 |
| Annual energy <br> use per site | $151,200 \mathrm{kWh}$ | $151,200 \mathrm{kWh}$ | $181,440 \mathrm{kWh}$ <br> $(20 \%$ <br> increase as <br> 36 lights/site <br> assumed) | Conservative estimate of 3,780 <br> kWh x 30 = 113,400 kWh |
| Annual change in <br> total number of <br> sites | 2\% increase <br> each year (8\% <br> increase by <br> 2016) | $1 \%$ increase <br> each year (4\% <br> increase by <br> $2016)$ | Status quo: <br> 3\% annual <br> increase per <br> year for first 5 <br> years (13\% <br> increase by <br> 2016), then <br> 2\%/year. <br> AMI: 1\% | increase by 2016 unlikely. <br> annual <br> increase. |
| AMI: If no more than 5\% | steating, reasonable to assume <br> that there may not be any <br> increase in the number of sites, <br> and maybe even a decrease. |  |  |  |


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|  | FortisBC <br> Status Quo | FortisBC AMI Probable | FortisBC AMI Potential | Prof. Boyd |
| :---: | :---: | :---: | :---: | :---: |
| Percentage sites stealing electricity | 25\%, increasing to $30 \%$ by 2017 | 25\% decreasing to $5 \%$ by 2021 | 25\% <br> decreasing to 5\% by 2021, with further decreases post 2021 | Status quo: same as current levels with some increase due to influx of growers. <br> AMI: Virtually certain that theft will decrease markedly, but exact estimate cannot be made with precision. May not be as low as $5 \%$. |
| Theft detection rate | 8\% | Increasing from 8\% to 25\% by 2016 | Increasing from 8\% to 25\% by 2016 | Not commented on |
| Recovered revenue from theft detection | Each theft site is billed for an average 1 year loss with collection success rate of $20 \%$ |  |  | Not commented on |
| Cost of Energy | BC Wholesale Market Energy Curve |  |  | Not commented on |
| LED penetration / legalization | None |  |  | Legalization/LED changes are entirely within the realm of possibility and could dramatically affect the validity of projections made. |

## Response:

The table is a reasonable comparison summary of the assumptions identified. Two minor corrections are noted below:

- In Row 3 Column 5 a greater than (underlined for emphasis) $40 \%$ increase in the number of sites is unlikely; and
- In Row 4 Column 4 the percentage of sites stealing electricity decreases from $25 \%$ to $4 \%$ by 2021 in the AMI Potential.
62.3 Does FortisBC support the opinion provided by Professor Neil Boyd in his June 24, 2012 letter? If no, please identify which aspects of the opinion FortisBC disagrees with and why.

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## Response:

FortisBC has stated on page 83 , line $26-28$ of the Application the uncertainty associated with predicting long term customer behaviour in an evolving environment. This uncertainty dictated the wisdom of seeking an independent opinion of the assumptions made and the Company requested a review by Professor Boyd at Simon Fraser School of Criminology.

FortisBC considered carefully Professor Boyd's response and finds many areas of agreement. Some of his opinion has been incorporated in the final calculation of the $\$ 38.4$ million theft benefit.

The following four areas detail aspects of his opinion that were not incorporated in the AMI Probable scenario presented in the Application.

1. Professor Boyd's opinion of 3 grow cycles per year versus the 4 assumed by FortisBC was not accepted for the AMI Probable because it is not supported by FortisBC experience. The Company has consistently assumed and invoiced for 4 annual grow cycles since 2006. This assumption has never been challenged by producers who pay the invoice. While Professor Boyd did not present any supporting evidence for his conservative opinion, the reduction to 113,400 annual KWhs per site was incorporated in the additional Low Forecast of $\$ 29$ million presented in Table 5.3.2d from the Application.
2. FortisBC does not disagree with Professor Boyd's opinion that the total number of sites may increase from a low of $10 \%$ to a maximum of $40 \%$ by 2016 . However this is a very wide range and FortisBC has chosen instead to use a more consistent approach by adopting a $2 \%$ forecast increase in customer growth. The change from $8 \%$ to $10 \%$ in the Status Quo has a negligible impact on the calculation.

Professor Boyd's assumption that if AMI results in a theft ratio of 5\% the number of production sites may not increase but may even decrease was not accepted or included in the calculation. For a detailed discussion on why AMI will not result in a decline of marijuana producers in FortisBC's service territory please see the response to BCUC IR No. 1 Q87.2.
3. FortisBC agrees with Professor Boyd's opinion that theft will decrease markedly under AMI, and that a precise estimate is difficult to determine. However the Company does not accept that the theft ratio may not be as low as $5 \%$ under AMI. The Company has achieved a noteworthy reduction in its theft ratio under its current program with limited resources, technology and data quality as confirmed by Professor Boyd. It seems entirely reasonable to predict that the improvements possible under AMI deployment will yield an additional 20\% reduction in the theft ratio.
4. Professor Boyd's opinion that legalization and LED changes are entirely possible and could dramatically affect the validity of the projections made has limited acceptance at FortisBC. These changes are remotely possible and if they materialize could impact the assumptions made, however, they have not been modeled in the calculation of the theft benefit because there is considerable uncertainty on whether or not they will ever materialize within the life of the project.

The Company finds little to support the use of LED technology in indoor marihuana production. Please see the response to BCUC IR No. 1 Q84.3.1 for a detailed discussion on the impact of LED use.

The decriminalization or regulation of the marijuana industry in Canada has a number of political and legal hurdles that will take considerable time to resolve. The recent increase in criminal penalties for marijuana production and the proposed changes to the medical marijuana industry in Canada do not signal a more relaxed attitude to this industry. Additionally if decriminalization or regulation were to occur they would not address the lucrative export market.

More important than the differences noted above, Professor Boyd confirms the difficulty for FortisBC or for anyone else in predicting with any degree of certainty in an evolving environment over the long term. Considerably more certain are the safety and financial risks imposed on FortisBC customers in the status quo. Energy theft attributed to marijuana production means that in excess of 200 premises do not meet the Electric code and are costing ratepayers in excess of $\$ 3$ million annually. Eight percent of these sites are currently detected while the remaining 92 percent are undetected. It is not reasonable or desirable to delay a response until all facts can be predicted with complete certainty.
62.3.1 Please respond to Professor Boyd's opinion that electricity theft under AMI, while virtually certain to decrease markedly, may not drop as low as $5 \%$.

## Response:

Please refer to the response to BCUC IR No. 2 Q62.3.
62.4 Please explain why FortisBC assumes each theft site is billed for an average 1 year loss with collection success rate of $20 \%$, when its back-billing success rate associated with theft of electricity was $\$ 355,086$ out of a total of $\$ 714,411$.

## Response:

The collection success for theft invoices has been higher than expected for this type of billing however there is no certainty that this can be sustained over the longer term. FortisBC, in keeping with the conservative approach used in calculating the theft benefit, has reduced the collection success rate to 20 percent.
62.4.1 How far back does FortisBC generally bill for electricity from nonpaying illegal marijuana grow operations? Please explain why.

## Response:

The duration of billing for energy theft for marijuana sites diverting energy is generally based on the length of time the site has been in operation as estimated by the attending RCMP officer. The maximum time FortisBC will bill for is 2 years. The logic is that the risk of dispute and the risk of non-payment increases in relation the amount of the invoice and it is preferable to recover a portion of loss rather than nothing at all.
62.5 Please explain why, under the AMI scenario, the theft detection rate only increases from $8 \%$ to $25 \%$. Please include in your response a description of the barriers which prevent an even greater increase in the theft detection rate, and how these barriers could be addressed.

## Response:

Page 88 of the Application details $\$ 1.1$ million in capital investment and a $\$ 0.24$ million increase in annual operating expense associated with the energy balancing component of AMI deployment. This budget does not provide for full scale energy balancing and the accompanying field staff to support an immediate comprehensive approach. The success of theft detection is necessarily limited by the amount of capital investment and associated

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resources. It does not seem reasonable to project theft detection beyond a conservative 25 percent level until the results of the initial strategic approach can first be evaluated. It may be that this relatively modest investment will generate satisfactory returns or that additional capital expense can be justified by incremental returns.
62.6 Please determine the net benefit to ratepayers (i.e. NPV of the difference in electricity theft due to illegal marijuana grow operations under AMI compared to the status quo), over the project period under the following scenarios. Please exclude any financial impacts related to paying illegal grow-operations. Please describe all assumptions used and include a working excel spreadsheet showing the analysis.

For each scenario, please also explain to what extent FortisBC considers such a scenario appropriate for the purposes of evaluating the financial benefit to ratepayers of AMI as it relates to a reduction in electricity theft due to illegal marijuana grow operations.

|  | Scenario 1A | Scenario 1B | Scenario 2 | Scenario 2B |
| :--- | :--- | :--- | :--- | :--- |
| Description | 0\% site increase <br> under AMI, short- <br> term avoided <br> energy cost | 0\% site increase <br> under AMI, LRMC <br> energy cost of new <br> resources | 2\% site decrease <br> under AMI, short- <br> term avoided <br> energy cost | 2\% site decrease <br> under AMI, LRMC <br> energy cost of new <br> resources |
| Number of illegal <br> marijuana sites in <br> Fortis BC service <br> area (2012) | 824 | 824 | 824 | 824 |
| Annual energy <br> use per site | $113,400 \mathrm{kWh}$ | $113,400 \mathrm{kWh}$ | 113,400 kWh | 113,400 kWh |
| Annual change in <br> total number of <br> sites | $2 \%$ increase each <br> year for status <br> quo. 0\% per year <br> increase for AMI | $2 \%$ increase each <br> year for status quo. <br> $0 \%$ per year <br> increase for AMI | $2 \%$ increase each <br> year for status <br> quo. 2\% per year <br> decrease for AMI | $2 \%$ increase each <br> year for status quo. <br> $2 \%$ per year <br> decrease for AMI |
| Percentage sites <br> stealing electricity | $25 \%$, increasing <br> to 30\% by 2017 <br> for status quo. <br> $25 \%$ decreasing | $25 \%$, increasing to <br> $30 \%$ by 2017 for <br> status quo. <br> $25 \%$ decreasing to <br> $5 \%$ by 2021 for AMI | $25 \%$, increasing <br> to 30\% by 2017 <br> for status quo. <br> $25 \%$ decreasing <br> to 5\% by 2021 for <br> AMI | $25 \%$, increasing to <br> 30\% by 2017 for <br> status quo. <br> $25 \%$ decreasing to <br> $5 \%$ by 2021 for AMI |


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|  | Scenario 1A | Scenario 1B | Scenario 2 | Scenario 2B |
| :--- | :--- | :--- | :--- | :--- |
| Theft detection <br> rate | 8\% for status quo. <br> Increasing from <br> $8 \%$ to 25\% by <br> 2016 for AMI | 8\% for status quo. <br> Increasing from 8\% <br> to 25\% by 2016 for <br> AMI | 8\% for status <br> quo. <br> Increasing from <br> $8 \%$ to 25\% by <br> 2016 for AMI | 8\% for status quo. <br> Increasing from 8\% <br> to 25\% by 2016 for <br> AMI |
| Recovered <br> revenue from theft <br> detection | Set based on <br> average actual <br> results from 2006 <br> to 2011 | Set based on <br> average actual <br> results from 2006 to <br> 2011 | Set based on <br> average actual <br> results from 2006 <br> to 2011 | Set based on <br> average actual <br> results from 2006 to <br> 2011 |
| Cost of Energy <br> (refer to Order G- <br> 3-12, pp. 37-39) | Short-term <br> avoided cost <br> (Midgard <br> Consulting 2011 <br> report, Table <br> 5.1.3.3A) | LRMC of additional <br> power from new <br> resources, including <br> the cost to <br> transport/distribute <br> that energy to <br> residential <br> customers. | Short-term <br> avoided cost <br> (Midgard <br> Consulting 2011 <br> report, Table <br> $5.1 .3 .3 A)$ | LRMC of additional <br> power from new <br> resources, including <br> the cost to <br> transport/distribute <br> that energy to <br> residential <br> customers. |
| LED penetration / <br> legalization | None | None | None | None |

## Response:

The requested NPV values are contained in the table below. The requested supporting calculations are provided as Electronic Attachment BCUC IR2 Q62.6. All assumptions are unchanged from the AMI Probable Scenario as filed except for the ones detailed in the following table.

None of these scenarios are considered appropriate for the following reasons:

1. The number of marijuana production sites is not projected to remain constant or decline under AMI versus the Status Quo. Please see the response to BCUC IR No. 1 Q87.2;
2. Professor Boyd's estimate of 113,400 kWhs annually per site is not accepted by FortisBC as Company experience from 2007-2011 supports the 151,200 KWH estimate used in the Application. Please see the response to BCUC IR No. 2 Q62.3;
3. The recovered revenue from theft detection calculated as the average of the 2006-2011 periods was not used in the Application as the values show a decreasing trend for 20122011. Please see the response to BCUC IR No. 2 Q62.4;
4. The LRMC of new resources plus distribution and transportation costs as the power purchase price for the load associated with marijuana production is supported in the Plecas Report. However this price is not consistent with the conservative approach

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| Table BCUC IR 2 Q 62.6 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Scenario 1A | Scenario 1B | Scenario 2 | Scenario 2B |
| Description | 0\% site increase under AMI, short-term a voided energy cost | 0\% site increase under AMI, LRMC energy cost of new resources | 2\% site decrease under AMI, short-term avoided energy cost | $2 \%$ site decrease under AMI, LRMC energy cost of new resources |
| Number of illegal marijuana sites in Fortis BC service area (2012) | 824 | 824 | 824 | 824 |
| Annual energy use per site | 113,400kWh | 113,400kWh | 113,400 kWh | 113,400 kWh |
| Annual change in total number of sites | 2\% increase each year for status quo. 0\% per year increase for AMI | 2\% increase each year for status quo. 0\% per yearincrease for AMI | 2\% increase each year for status quo. 2\% per year decrease for AMI | $2 \%$ increase each year for status quo. 2\% per year decrease for AMI |
| Percentage sites stealing electricity | $25 \%$, increasing to $30 \%$ by 2017 for status quo. <br> 25\% decreasing to 5\% by 2021 for AMI | 25\%, increasing to 30\% by 2017 for status quo. <br> 25\% decreasing to 5\% by 2021 for AMI | 25\%, increasing to 30\% by 2017 for status quo. <br> 25\% decreasing to 5\% by 2021 for AMI | $25 \%$, increasing to $30 \%$ by 2017 for status quo. <br> 25\% decreasing to 5\% by 2021 for AMI |
| Theft detection rate | 8\% for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI | 8\% for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI | 8\% for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI |
| Recovered revenue from theft detection calculated as 1 year back bill plus 49\% | Set based on average actual results from 2006 to 2011 | Set based on average actual results from 2006 to 2011 | Set based on average actual results from 2006 to 2011 | Set based on average actual results from 2006 to 2011 |
| Cost of Energy (refer to Order G-3-12, pp. 37-39) | Short-term avoided cost (Midgard Consulting 2011 report, Table (5.1.3.3A) | LRMC of additional power from new resources, including the cost to transport/distribute that energy to residential customers. | Short-term a voided cost (Midgard Consulting 2011 report, Table (5.1.3.3A) | LRMC of additional power from new resources, including the cost to transport/distribute that energy to residential customers. |
| LED penetration / legalization | None | None | None | None |
| Financial Impacts from paying illegal grow operations | Not Included | Not Included | Not Included | Not Included |
| NPV Theft Benefit | \$ 17,781,583 | \$ 25,387,519 | \$ 18,042,445 | \$ 26,023,963 |

generally taken in calculating the theft reduction benefit attributed to AMI deployment and the Company chose instead to use the Midgard price table. Please see the response BCUC IR No. 2 Q61.2 and the Company chose instead to use the Midgard price table. Please see the response BCUC IR No. 2 Q61.2.

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62.6.1 Please redo the analysis above, but assume the percentage of sites stealing electricity decreases from $25 \%$ to $10 \%$ by 2021 for AMI.

## Response:

The requested NPV values are contained in the table which follows. The requested excel file supporting the calculations are provided as Electronic Attachment BCUC IR2 62.6. All assumptions are unchanged from the AMI Probable Scenario as filed except for the ones detailed in the following table.

The proposal that the percentage of sites stealing electricity will decline to ten versus five percent as proposed in the Application is not deemed appropriate as FortisBC has achieved noteworthy results under the Status Quo with limited resources, technology and data quality. Please see the response to BCUC IR No. 2 Q62.3.

The remaining changes in the calculation proposed by the Commission are also not deemed to be appropriate. Please see the response to BCUC IR No. 2 Q62.6.

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| Table BCUC IR 2 Q 62.6.1 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Scenario 1A | Scenario 1B | Scenario 2 | Scenario 2B |
| Description | 0\% site increase under AMI, short-term avoided energy cost | 0\% site increase under AMI, LRMC energy cost of new resources | 2\% site decrease under AMI, short-term avoided energy cost | 2\% site decrease under AMI, LRMC energy cost of new resources |
| Number of illegal marijuana sites in Fortis BC service area (2012) | 824 | 824 | 824 | 824 |
| Annual energy use persite | 113,400kWh | 113,400kWh | 113,400 kWh | 113,400 kWh |
| Annual change in total number of sites | 2\% increase each year for status quo. <br> 0\% per year increase for AMI | 2\% increase each year for status quo. <br> 0\% per year increase for AMI | 2\% increase each year for status quo. <br> 0\% per year increase for AMI | 2\% increase each year for status quo. <br> 0\% per year increase for AMI |
| Percentage sites stealing electricity | 25\%, increasing to 30\% by 2017 for status quo. <br> 25\% decreasing to $10 \%$ by 2021 for AMI | $25 \%$, increasing to $30 \%$ by 2017 for status quo. <br> 25\% decreasing to $10 \%$ by 2021 for AMI | $25 \%$, increasing to $30 \%$ by 2017 for status quo. <br> 25\% decreasing to $10 \%$ by 2021 for AMI | $25 \%$, increasing to $30 \%$ by 2017 for status quo. <br> 25\% decreasing to $10 \%$ by 2021 for AMI |
| Theft detection rate | 8\% for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to $25 \%$ by 2016 for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% by 2016 for AMI |
| Recovered revenue from theft detection calculated as 1 year back bill plus 49\% | Set based on average actual results from 2006 to 2011 | Set based on average actual results from 2006 to 2011 | Set based on average actual results from 2006 to 2011 | Set based on average actual results from 2006 to 2011 |
| Cost of Energy (refer to Order G 3-12, pp. 37-39) | Short-term avoided cost (Midgard Consulting 2011 report, Table 5.1.3.3A) | LRMC of additional power from new resources, including the cost to transport/distribute that energy to residential customers. | Short-term avoided cost (Midgard Consulting 2011 report, Table 5.1.3.3A) | LRMC of additional power from new resources, including the cost to transport/distribute that energy to residential customers. |
| LED penetration / legalization | None | None | None | None |
| Financial Impacts from paying illegal grow operations | Not included | Not included | Not included | Not included |
| NPV Theft Benefit | \$ 17,141,879 | \$ 24,020,224 | \$ 17,568,618 | \$ 24,981,148 |

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62.6.2 Please also determine the NPV using the same approach as above, but using assumptions made in the Application for (i) the FortisBC AMI Probable scenario, and (ii) the FortisBC AMI Potential scenario. In table form, please compare the key assumptions used by FortisBC for these two scenarios with the four scenarios modeled in the

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question above. Please describe all assumptions used and include a working excel spreadsheet showing the analysis.

## Response:

Please see the tables which follow and Electronic Attachment BCUC IR2 62.6. All assumptions are unchanged from the AMI Probable and AMI Potential as filed except for the ones noted in the following tables. Please see the response to BCSEA IR No. 1 Q 34.3 for a description of the assumptions used in the AMI Potential Scenario.

Please note, due to a minor cell reference error, the NPV of Theft Benefit for the AMI Potential Scenario has been corrected to $\$ 51,644,127$ from $\$ 52,041,696$ as presented in the Application.

| Table BCUC IR 2 Q 62.6.2a- NPV Scenario Comparison AMI Probable |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Key Assumptions | AMI Probable as filed | Scenario 1A | Scenario 1B | Scenario 2 | Scenario 2B |
| Cost of Energy | Midgard avoided short term cost (2011) | Midgard avoided short term cost (2011) | LRMC new resources plus distribution and transportation costs | Midgard avoided short term cost (2011) | LRMC new resources plus distribution and transportation costs |
| Percentage of sites stealing electricity | $25 \%$ increasing to $30 \%$ by 2017 for status quo 25\% decreasing to 5\% for AMI | $25 \%$ increasing to $30 \%$ by 2017 for status quo <br> 25\% decreasing to $5 \%$ for AMI | $25 \%$ increasing to $30 \%$ by 2017 for status quo <br> $25 \%$ decreasing to $5 \%$ for AMI | $25 \%$ increasing to $30 \%$ by 2017 for status quo 25\% decreasing to $5 \%$ for AMI | $25 \%$ increasing to $30 \%$ by 2017 for status quo <br> 25\% decreasing to 5\% for AMI |
| Number of illegal marihuana sites at FortisBC (2012) | 824 | 824 | 824 | 824 | 824 |
| Annual energy use per site (KWhs) | 151,200 | 151,200 | 151,200 | 151,200 | 151,200 |
| Annual Change in \# of sites | 2\% annual increase for status quo. <br> 1\% annual increase for AMI | 2\% annual increase for status Quo. <br> 0\% annual increase for AMI | 2\% annual increase for status quo. 0\% annual increase for AMI 0\% annual increase for AMI | 2\% annual increase for status quo. 2\% decrease for AMI 0\% annual increase for AMI | 2\% annual increase for status quo. 2\% decrease for AMI <br> 0\% annual increase for AMI |
| Theft Detection Rate | 8\% for status quo. <br> Increasing from 8\% to 25\% for AMI | 8\% for status quo. <br> Increasing from 8\% to 25\% for AMI | 8\% for status quo. <br> Increasing from 8\% to 25\% for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI |
| Recovered revenue from theft detection | 1 year back billing plus 20\% | 1 year back billing plus 20\% | 1 year back billing plus 20\% | 1 year back billing plus 20\% | 1 year back billing plus 20\% |
| LED penetration/legalization impacts | None | None | None | None | None |
| NPV of Theft Benefit | \$ 38,386,403 | \$ 30,001,781 | \$ 37,042,395 | \$ 15,751,205 | \$ 28,706,179 |


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| Table BCUC IR 2 Q 62.6.2b - NPV Scenario Comparison AMI Potential |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Key Assumptions | AMI Potential as filed | Scenario 1A | Scenario 1B | Scenario 2 | Scenario 2B |
| Cost of Energy | Midgard avoided short term cost (2011) | Midgard avoided short term cost (2011) | LRMC new resources plus <br> distribution and <br> transportation costs | Midgard avoided short term cost (2011) | LRMC new resources plus <br> distribution and <br> transportation costs |
| Percentage of sites stealing electricity | $25 \%$ increasing to $32 \%$ by 2017 for status quo <br> 25\% decreasing to 0\% for AMI | $25 \%$ increasing to $32 \%$ by 2017 for status quo <br> 25\% decreasing to 0\% for AMI | $25 \%$ increasing to $32 \%$ by 2017 for status quo <br> 25\% decreasing to 0\% for AMI | $25 \%$ increasing to $32 \%$ by 2017 for status quo <br> 25\% decreasing to 0\% for AMI | $25 \%$ increasing to $32 \%$ by 2017 for status quo <br> $25 \%$ decreasing to $0 \%$ for AMI |
| Number of illegal marihuana sites at FortisBC (2012) | 824 | 824 | 824 | 824 | 824 |
| Annual energy use per site (KWhs) | 181,400 | 181,400 | 181,400 | 181,400 | 181,400 |
| Annual Change in \# of sites | 3\% annual increase for status quo 2013-2017 and 2\% thereafter. <br> 1\% annual increase for AMI | 3\% annual increase for status quo 2013-2017 and 2\% thereafter. <br> 0\% annual increase for AMI | 3\% annual increase for status quo 2013-2017 and 2\% thereafter. <br> $0 \%$ annual increase for AMI | 3\% annual increase for status quo 2013-2017 and 2\% thereafter. <br> 0\% annual increase for AMI | 3\% annual increase for status quo 2013-2017 and 2\% thereafter. <br> 0\% annual increase for AMI |
| Theft Detection Rate | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI | $8 \%$ for status quo. <br> Increasing from 8\% to 25\% for AMI |
| Recovered revenue from theft detection | 1 year back billing plus 20\% | 1 year back billing plus 20\% | 1 year back billing plus $20 \%$ | 1 year back billing plus 20\% | 1 year back billing plus 20\% |
| LED penetration/legalization impacts | None | None | None | None | None |
| NPV of Theft Benefit | \$ 51,644,127 | \$ 40,470,260 | \$ 51,641,797 | \$ 21,420,312 | \$ 39,689,082 |

62.7 Please explain why the NPV analysis presented by FortisBC on page 69 of the Application states that it is for the period between 2015 and 2030 (in 2012 dollars), and yet the NPV of net benefit on Table 5.3.2.b starts at 2012.

## Response:

Please note, page 69 of the Application, line 11, should have indicated for the period between $\underline{2013}$ and $\underline{2032}$ (in 2012 dollars). There is no theft benefit recorded for 2012.

### 63.0 Reference: Electricity Theft - Marijuana Grow Operations

## Exhibit B-6, BCUC IR 1.86.1, Appendix 1, 1.83.4.1, 1.86.2; CBC News

 Article, March 2012, Edmonton firefighter suspended after grow-op bust
## Sensitivity analysis

Professor Boyd states in the Appendix to FortisBC response to BCUC IR 1.86.1:
"Public opinion polls in Canada demonstrate significant support for the decriminalization of possession, and for some degree of regulation of the industry. ... cannabis culture forums discuss the emerging efficacy of LED lighting ..." (Pages 3, 4)
"Changes within the industries of control and product could dramatically affect the validity of any projections made, whether by Fortis, myself, or other researchers - and these changes are entirely within the realm of possibility." (Page 4)
"There are no local governments served by FortisBC that require Fortis to disclose account information of customers with high loads. ... Consider, alternatively, the approach taken by Mission BC. ... from 2000 to 2005 only 13\% of indoor grows discovered in the city of Mission had stolen electricity. In the period 2006 to 2010 the incidence of theft of electricity in uncovered grows in the city was almost five times higher; 57 per cent of these operations had evidence of theft: the grows were larger, with more plants, and a higher average number of lights." (Page 5)
"If FortisBC was to resist AMI deployment and local governments in the region were to simultaneously embrace the [Safety Standards Amendment] Act of 2006, a worst case scenario seems likely to emerge. The number of growers in the region would increase, given knowledge of the lack of AMI deployment, and the majority would steal electricity, knowing that their high levels of consumption would be reported by Fortis to local governments, and, in turn, to police." (Page 6)

Appendix 4 to this IR (see Attachment Panel) is a CBC news report titled "Edmonton firefighter suspended after grow-op bust." ${ }^{15}$ The reports states:
"Police say they found 500 marijuana plants valued at more than $\$ 500,000$ at the home. Police say it was the first grow-op in Canada to have used LED (light-emitting diode) lights in the operation, which draw less electricity and are more difficult to detect."

FortisBC states in BCUC IR 1.83.4.1 "It appears that there is considerable information available (much of it from LED suppliers) to suggest that LED lighting has a great deal of "future potential", but there is little credible evidence to support a current trend towards LED use by marijuana grow operations."

[^8]FortisBC states in BCUC IR 1.86.2 "FortisBC does not contemplate the conversion to LED lighting systems by producers during the life of the project. ... However, if it were possible that a marketable prototype were in use by up to two percent of growers beginning in 2017 ..."
A November 7, 2012 CNN report states: ${ }^{16}$
"Moments after President Barack Obama was declared elected Tuesday night ... Washington state was joining Colorado in declaring pot legal. ... Kirk Tousaw, a Vancouver Island lawyer [stated] "Canadian prohibitionists that used to claim that we can't legalize because of American reaction at the border have lost that argument"."
63.1 Please describe whether, and to what extent, legalization of marijuana in BC could reduce the expected financial benefit associated with the AMI proposal as it relates to a reduction in electricity theft.

## Response:

The Company does not predict that the potential regulation of marijuana production in $B C$ will result in the decline of the theft reduction benefit projected under AMI. Several things must be considered in arriving at this conclusion.

Provincial legalization of an illegal substance that is governed by the federal Controlled Drug and Substance Act (CDSA) will not necessarily result in greater autonomy for illegal BC marijuana producers. Changes in federal regulation will be required to facilitate provincial legalization. The enactment of the Conservative Omnibus Bill in March 2012 increased penalties for illegal marijuana production in Canada, which does not signal a federal move towards legalization.

The 2011 Diplock and Plecas report filed by the Commission as Exhibit A2-1 cites domestic consumption in BC at 9-12 percent of total provincial production. Provincial regulation in BC will not eliminate the lucrative 90 percent national and international export markets.

If federal and provincial jurisdictions were to align to facilitate provincial regulation it seems reasonable to expect the provincial market will increase as users will not face criminal charges. The tetra hydro cannabinol ("THC") content of illegal marijuana has increased four- fold since 1980 largely due to indoor production methods. ${ }^{17}$ These users will not necessarily move to the use of a regulated product if the quality as measured by the THC content is less than that

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offered on the illegal market. The result of provincial regulation could be an increase in the domestic market for illegal production and a corresponding increase in the theft benefit.

The Company has indicated in the Application the uncertainty in predicting long term customer behaviour in an evolving environment. This challenge has also been identified by Professor Boyd. FortisBC has calculated a conservative theft benefit based on the most current information available which clearly signals the negative safety and financial impacts for FortisBC customers. A myriad of assumptions both nationally and globally can be made regarding future developments that may increase or decrease the theft benefit calculation depending on which assumptions occur together and the timing in which they may occur during the life of the Project. Illegal marijuana producers are a resourceful group and will respond in ways to protect existing markets or create new ones in order to preserve profits. Given the uncertainty on the future of the industry in BC, Canada and globally, the Company submits that it is not possible to predict the potential positive or negative impacts of provincial regulation for marijuana producers on the Application. Please also see the response to BCUC IR No. 2 Q63.2.
63.1.1 Does FortisBC consider that, in evaluating the AMI proposal, financial benefits related to a reduction in electricity theft by illegal marijuana grow operations should be shown as a range of reasonable benefits to reflect a risk of legalization in BC over the project term? If no, please explain why not. If yes, please explain what this range should be.

## Response:

Please refer to the response to BCUC IR No. 2 Q63.1.
63.2 Please describe whether, and to what extent, recent legalization of marijuana in Washington and Colorado could reduce the expected financial benefit associated with the AMI proposal (for example, by reducing demand for BC grown marijuana or increasing the probability that marijuana will be legalized in $B C$ ).

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## Response:

FortisBC does not anticipate that the legalization of marijuana production in Washington and Colorado will result in the decline of the theft reduction benefit projected under AMI. The following factors are considered in arriving at this conclusion.

As in Canada, marijuana is a federally controlled substance in the US and the federal government has yet to indicate its response to the state votes. Regulation endorsed by state constituents will not necessarily result in federally authorized marijuana production.

The Washington and Colorado markets represent only a portion of the $B C$ export marijuana market. The markets in other American states and existing global markets for BC will remain.

Marijuana legalization in Washington and Colorado will likely result in an increased demand for marijuana and if the regulated US drug is of lesser quality then demand for the illegal BC product will increase. This scenario will increase rather than decrease the theft benefit under the AMI proposal.

Illegal marijuana production is a very lucrative business and producers will find creative ways to differentiate their product (i.e. "higher" THC content) or create new markets in the face of regulated competition.

Proposed marijuana legalization by two American states does not open the US border nationally to an illegal Canadian product nor does it remove the barriers to federal and provincial regulation in Canada. Considerable discussion will be necessary within and between both nations before wide scale changes will occur in the marijuana industry. Given the strongly held views on marijuana regulation, industry changes at federal levels that might impact the theft benefit calculation will be slow in development. The Company submits that it is not possible to predict the impact of state regulation for $B C$ or on the Application generally. Please refer to the response to BCUC IR No. 2 Q63.1.
63.2.1 Please update the FortisBC estimate of NPV of benefit from AMI as it relates to a reduction of theft related to illegal marijuana grow operations to reflect these recent developments.

## Response:

It is not possible to calculate the impact of these recent developments on the NPV of theft benefit for the AMI Project. FortisBC believes that any impact will be negligible and may
actually improve the theft detection benefit. Please refer to the responses to BCUC IR No. 2 Q63.1 and Q63.2.
63.3 Is FortisBC satisfied that there is no evidence to support a risk of a move towards LED lights by a significant number of illegal marijuana grow operations over the project term? Please include in the response consideration of the LED illegal grow operation in Edmonton.

## Response:

FortisBC is satisfied that there is no evidence to support a risk of a move towards LED lights by a significant number of illegal grow operations over the life of the project. Please see the response to BCUC IR No. 1 Q83.4.1 for the rationale supporting this belief.

The single marijuana production site found in Edmonton represents $0.01 \%$ of the 8449 total marijuana sites charged with cultivation in Canada for 2003. Please see Table 1.1 in the 2005 Plecas, Malm and Kinney report provided as Appendix CSTS IR1 77.7. FortisBC respectfully submits that this does not constitute sufficient evidence to indicate a significant switch to the use of LED lights in illegal marijuana production. The Company is of the view that a more significant consideration is the experience of the $B C$ Growers' Association (please see the response to BCUC IR No. 1 Q83.4.1). This group is motivated financially to reduce energy consumption and to date has not found a proven prototype for commercial applications.
63.3.1 Does FortisBC consider that, in evaluating the AMI proposal, financial benefits related to a reduction in electricity theft by illegal marijuana grow operations should be shown as a range of reasonable benefits to reflect a risk of a move to LED lights over the project term? If no, please explain why not. If yes, please explain what this range should be.

## Response:

FortisBC does not consider that there is sufficient evidence to indicate a risk of movement to LED lights for illegal marijuana production and did not consider this scenario in the calculation of
the range of reasonable benefits for theft reduction. Please see also the response to BCUC IR No. 1 Q84.3.1 and BCUC IR No. 2 Q63.3.
63.4 Has FortisBC consulted with local governments to identify if their use of the provisions of the Safety Standards Amendment Act of 2006 to identify illegal marijuana grow operations could change in the future under both the Status Quo and AMI scenario? If yes, please explain the results of consultation. If no, please explain why not.

## Response:

FortisBC has not consulted generally with local governments in its service area to determine their future intent regarding the use of the provisions of the 2006 Safety Standards Act Amendment. The changes to the Act have been well publicized by the Ministry of Mines, Energy and Resources along with the experiences of the lower mainland municipalities that have engaged under the Amendment. To date there has been no engagement of the provisions within the FortisBC service area and no signal of interest since 2008. The Company saw no benefit from additional consultation.
63.4.1 Please describe whether, and to what extent, a request by local governments served by FortisBC to disclose account information of customers with high loads for the purpose of identifying illegal marijuana grow operations could affect the expected financial benefits associated with the AMI proposal as it relates to a reduction in electricity theft over the project term.

## Response:

FortisBC does not anticipate municipal engagement under the Safety Standards Act 2006 Amendment. However should local governments in the service area engage, theft ratios under both the Status Quo and AMI Scenarios will deteriorate. As Professor Boyd indicates, municipal engagement with no AMI deployment at FortisBC will create a worse- case scenario for FortisBC customers as theft ratios could increase to $50 \%$ in the Status Quo and may decline to $15 \%$ under AMI. Please see the response to BCUC IR No. 1 Q87.2.3.

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63.4.1.1 Does FortisBC consider that, in evaluating the AMI proposal, financial benefits related to a reduction in electricity theft by illegal marijuana grow operations should be shown as a range of reasonable benefits to reflect the risk of local government use of the provisions of the Safety Standards Amendment Act of 2006 to identify illegal marijuana grow operations? If no, please explain why not. If yes, please explain what this range should be.

## Response:

Fortis $B C$ does not consider the risk of municipal engagement under the Safety Standards Act Amendment of 2006 sufficient to be considered in calculating a range of reasonable benefits for the Project. There are no signals from local governments indicating an interest in engaging under the Act. However the Company notes that if such a scenario were to occur the NPV of the theft benefit will increase beyond that submitted in the Application. Please see the response to BCUC IR No. 1 Q87.2.3 and BCUC IR No. 2 Q63.4.1.

### 64.0 Reference: Marijuana Grow Operations - General

CPCN Guidelines, Appendix A; RCMP, Drug Situation in Canada - 2007, p.3; Edmonton Police Service, Green Team, home page; Global News, Toronto Police see a dramatic rise in grow operation busts, April 2011; City of Surrey and University of the Fraser Valley, Community Response to Marijuana Grow Operations, 2009, p.14; Exhibit B-6, BCUC IR 1.85.5

Alternative options
Appendix A of the 2010 Certificates of Public Convenience and Necessity Application Guidelines states that the application under sections 45 and 46 of the UCA should contain the following:
"2 (i) ... The applicant should identify alternatives that it deemed to be not feasible at an early screening stage, and provide the reason(s) why it did not consider them further;

2 (ii) A comparison of the costs, benefits and associated risks of the project and feasible alternatives, including estimates of the value of all of the costs and benefits of each option or, where these costs and benefits are not quantifiable, identification of the cost or

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benefit that cannot be quantified. Cost estimates used in the economic comparison should have, at a minimum, a Class 4 degree of accuracy ..."
The Guidelines states on page 6: ${ }^{18}$ "Cost estimates used in the economic comparison should have, at a minimum, a Class 4 degree of accuracy as defined in the Advancement of Cost Engineering ("EECA International") Recommend Practice No. 10S-90".
A RCMP report titled "Drug Situation in Canada - 2007" ${ }^{19}$ states on Page 3 "Canadian law enforcement agencies have reported marihuana cultivation in all provinces, although British Columbia (B.C.), Ontario, and Quebec remain the primary producing regions, as demonstrated by smuggling patterns."
The Edmonton Police Service Green Team website page included the following statement: ${ }^{20}$
"There has been an increase in the proliferation of marijuana grow operations in the City of Edmonton and the Province of Alberta. Marijuana grows have become highly organized and sophisticated. Marihuana production has become a multi-billion dollar industry in Canada and is the economic engine of organized crime!"
An April 2011 Global News report titled "Toronto Police see a dramatic rise in grow operation busts" states: ${ }^{21}$
"The number of marijuana grow operation busts by Toronto police has increased $77 \%$ since 2008, documents show. 248 properties which Toronto police allege were current or former grow operations were found in 2010 - mostly in neighbourhoods in the inner suburbs - which compares with 199 in 2009 and 140 in 2008."

A 2009 report by the City of Surrey and University of the Fraser Valley titled "Community Response to Marijuana Grow Operations: A Guide Towards Promising Practices" states: 22
"Additionally, during the summer of 2009, STOP Grow Ops Calgary Coalition partnered with utility companies to investigate electricity theft. New methods and technologies are being considered and piloted to identify promising practices for theft detection. The STOP Grow Ops Calgary Coalition has targeted theft of power to help shift the response to grow operations from enforcement to prevention. Being able to detect electricity theft not only can result in faster and more cost-effective investigations, it would also act as a

[^10]serious deterrent to grow operations and remove serious public safety hazards from neighbourhoods." (Page 14)

FortisBC state in BCUC IR 1.85.5 "The alternative option described above [expansion of the role of the Revenue Protection Program (which could be coupled with advanced meters at the feeder level)] has not been considered by FortisBC since the deployment of advanced meters at the feeder level in the absence of advanced meters at customer premises is not an effective tool in identifying electric theft."
64.1 Please describe the research/consultation FortisBC undertook (for example, discussions with other utilities, government agencies, community groups etc.) to identify alternative options address electricity theft and mitigate heath/safety issues related to illegal marijuana grow operations.

## Response:

FortisBC consults with other North American utilities regularly on the most current options available to address electricity theft. The Company has collaborated at a more detailed level with other $B C$ and Alberta utilities since their experience more closely resembles that of FortisBC. The Company has consulted with the BC Safety Authority on a reporting protocol for reporting confirmed sites not in compliance with the Electric Code. FortisBC has also participated in discussions with municipalities who have expressed an interest in the reporting option available to local governments under the Safety Standards Act Amendment of 2006, though these provisions have not yet been engaged in its service territory.

Fortis $B C$ has not consulted other utilities, government agencies and community groups on options to mitigate health and safety issues associated with illegal marijuana production as the required knowledge and authority on these issues reside with more appropriate jurisdictions.
64.1.1 Does FortisBC consider that marijuana grow operations are also a problem in Alberta, Ontario and Quebec? Please explain why/why not.

## Response:

The incidence of illegal marijuana production in Alberta, Ontario and Quebec is well documented in the sources cited by the Commission. This assumption is additionally supported in Table 1.1 of the 2005 report by Plecas, Malm and Kinney filed as the Appendix CSTS IR1 77.1 and Table 9 of the Easton Public Policy Paper filed as the Appendix BCUC IR1 74.1.

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64.1.2 Has FortisBC investigated and considered alternative approaches used in Alberta, Ontario and Quebec by utilities to address (i) health and safety issues related to illegal marijuana grow operations and (ii) electricity theft by illegal marijuana grow operations? If yes, please describe the alternative approaches used. If no, please explain why not.

## Response:

FortisBC has not specifically investigated or considered the approach used in Alberta under the STOP Grow Ops Calgary Coalition to address health and safety issues related to illegal marihuana production as these matters are beyond Company jurisdiction.

The role of the utility in the Alberta model is to investigate and report electricity theft, including theft associated with marijuana production to the police. This is the same approach employed at FortisBC under the Status Quo and this role will be further supported by the improvements proposed with AMI deployment.

FortisBC understands that the Alberta utilities are employing the same strategic energy balancing activities as proposed in the Application to aid in theft identification and deterrence.
64.2 Does FortisBC agree that an estimate of financial benefit from a reduction in theft from marijuana grow operations is included within the general description of a 'cost estimate used in the economic comparison' of the BCUC CPCN guidelines? If no, please explain why not.

## Response:

FortisBC submits that all financial considerations, costs and benefits, ought to be considered as part of the assessment of the overall project cost estimate and the forecast customer rate impact used in the economic comparison, which the Company believes is consistent with the CPCN guidelines.

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64.2.1 Does FortisBC consider that the estimate of financial benefit from a reduction in theft from marijuana grow operations has a Class 4 degree of accuracy as defined in the Advancement of Cost Engineering ("EECA International") Recommend Practice No. 10S-90. Please explain why/why not.

## Response:

Yes. As described in the revised response to BCUC IR No. 1 Q53.3 (Exhibit B-6-5), FortisBC considers the project estimate overall (costs and benefits) to be consistent with an AACE Class 3 estimate.
64.3 Does FortisBC consider that there could be a net benefit to $B C$ from a delay in AMI rollout to allow time for additional investigation and analysis of alternative options to address electricity theft and health and safety issues from marijuana grow operations? Please explain why/why not.

## Response:

FortisBC does not consider that a delay in AMI rollout at FortisBC to allow time for additional investigation and analysis of alternate options to address electricity theft would yield a net benefit to BC. Several factors are considered in arriving at this conclusion.

- FortisBC customers, employees and the general public currently face the safety risks associated with approximately 200 theft sites that do not meet the requirements of the Electric Code. This number is projected to increase if AMI deployment is delayed.
- FortisBC customers are facing financial losses estimated at $\$ 3.7$ million annually. This figure is also projected to increase if AMI deployment is delayed.
- A delay in the additional operational and financial advantages of the project cited in the Application will impose additional lost benefits for FortisBC customers.
- BC Hydro has stated on page 23 of the SMART Metering \& Infrastructure Program Business Case (Exhibit B-1, Appendix C-4) the results of four theft detection pilots and demonstrated that energy balancing is an effective tool in identifying and deterring electricity theft.
- The implementation of an AMI-based theft detection program at BC Hydro is expected to drive marijuana production to FortisBC if it does not implement a similar program.
- Company results under the existing program over the last 7 years highlight the inefficiency of a manual approach to detecting electric theft either at the feeder level or customer premise level.

The Company is of the view that a delay in AMI deployment is not in the interest of FortisBC customers or the general public from both a safety and financial perspective.
64.3.1 Does FortisBC consider that there could be a net benefit to $B C$ from a pilot roll out of AMI in one or more areas in order to increase the level of accuracy of the net benefits projection of a network wide AMI roll out as related to electricity theft and health and safety issues from marijuana grow operations? Please explain why/why not.

## Response:

FortisBC has proposed an initial phased approach to energy balancing as discussed on page 88 of the Application (Exhibit B-1) in order to assess results. This approach is expected to yield the benefits indicated in the Application, but if it becomes apparent that higher returns can be economically obtained, the Company may seek approval for additional capital and operational costs in a separate filing. Pilots have already been conducted in B.C. on the efficacy of energy balancing as a tool in identifying and deterring electricity theft. The Company respectfully submits that no additional benefit will be realized from conducting the same pilots prior to AMI deployment. Please also see the response to BCUC IR No. 2 Q64.3.
64.4 Is FortisBC satisfied that the level of funding for investigation into electricity theft from illegal marijuana grow operations is at its optimum level for the Status Quo scenario (i.e., that there would not be a net benefit to ratepayers from an increased budget for these activities?). If yes, please explain how FortisBC arrived at this conclusion. If no, please explain what additional level of funding would be considered optimal, and how this would affect the assumptions made regarding electricity theft over the project term in the Status Quo scenario.

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## Response:

The Company is satisfied that additional funding for the Status Quo Scenario would not yield incremental benefits to FortisBC customers. The existing resources are adequate to investigate the leads currently received. The difficulty is that efficiency is compromised due to the lack of the number and the quality of the tips received. The result is that only 8 percent of the estimated theft sites are identified each year. This level of efficiency will not improve with additional funding in the absence of AMI deployment. Please see the response to BCPSO IR No. 2 Q9.3.
64.5 To what extent would allowing individual customers to opt out of AMI affect the ability of FortisBC to detect theft and/or achieve health and safety benefits associated with a lower number of illegal marijuana grow operations? Please explain and quantify where possible.

## Response:

Please refer to the responses to BCUC IR No. 2 Q50.2, Q50.4 and Q50.4.1.

### 65.0 Reference: Marijuana Grow Operations - General <br> Order G-110-12, [Exhibit No.], pp. 22, 84; Ofgem, Strategy <br> consultation for the RIIO-ED1 electricity distribution price control, <br> 2012, pp. 5-6; FEU Common Rates, Amalgamation and Rate Design <br> Application, Exhibit B-9, BCUC IR 1.10.2; Exhibit B-6, BCUC IR 1.56.3 <br> Measurement/Verification and Regulatory Incentives

The Commission stated in its 2012 Order on an Application by FortisBC Inc. for Approval of 2012-2013 Revenue Requirements and Review of 2012 Integrated System Plan (G-110-12): ${ }^{23}$
"The Commission Panel agrees that imposing some form of productivity factor is not a decision to be taken lightly. However, there may be cases where a utility has been unable to satisfy the Commission that it has taken the necessary steps to ensure

[^11]productivity and efficiency levels within the organization have been optimized. In these instances, some form of productivity adjustment to the O\&M budgets of a utility are warranted. One purpose of examining productivity in greater detail in recent proceedings has been to encourage utilities to formalize processes to help create a productivity improvement culture and, where appropriate, to make the sometimes difficult decision to bring about change. These are difficult times for many ratepayers and the Commission Panel believes this is the least they can expect." (Page 22)
"The Commission Panel is of the view that the increase in the size of FortisBC's rate base is an issue given that it is the main driver of rate increases which have been and are predicted to be well in excess of inflation. ... the Commission Panel is concerned with the magnitude of rate increases, which are forecast to continue beyond the test period, and is of the view that capital expenditures must be scrutinized carefully." (Page 84)

The UK electricity and gas regulator (Ofgem), in its September 2012 Strategy consultation for the RIIO-ED1 electricity distribution price control stated on page 5 and 6 : 24
"Significant expenditure is needed in Britain's gas and electricity networks over the next decade. This investment is needed to ensure consumers continue to receive safe, reliable network services and to meet environmental challenges. It is therefore more important than ever that network companies can show consumers that they are getting value for money and that charges are contained. ...
To drive this change, in 2010 we announced a new regulatory framework. The RIIO model (Revenue = Incentives + Innovation + Outputs) is designed to drive real benefits for consumers; providing companies with strong incentives to meet the challenges of delivering a sustainable energy sector at a lower cost. ..

We will attach incentives to the delivery of outputs, the strength of which will reflect the value consumers attach to delivery and DNOs' degree of control. We will put in place mechanisms to ensure efficient risk sharing between DNOs and consumers."

Fortis Energy Utilities (FEU) stated in BCUC IR 1.10.2 in the Common Rates, Amalgamation and Rate Design Application "The FEU agree that cost causation should be a foundation of rate setting ... "

FortisBC states in BCUC IR 1.56 .3 that its benefit realization monitoring plan as related to theft reduction is as follows:
"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.

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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."
65.1 Does FortisBC consider that an alternative regulatory framework could provide a better sharing of risks/rewards between ratepayers and the FortisBC shareholder? If no, please explain why not. If yes, please describe an alternative framework(s) for sharing of risks/rewards between the FortisBC shareholder and the ratepayer.
Please include in this response consideration of a performance based regulatory mechanism designed specifically for the AMI project, which links shareholder returns to realization of project benefits rather than the amount of invested capital.

## Response:

No. FortisBC considers that all prudently incurred investments should be included in the Company's revenue requirement and recovered as determined through customer rates. Given that the Project is prudent and necessary, no mechanism to effect an alternate sharing of risks/rewards between ratepayers and FortisBC is required. The Commission must assess and determine whether the proposed Project is necessary and in the public interest based on the analysis and evidence provided.
65.1.1 Please describe a measurement and verification approach FortisBC could use to identify (i) the decreases in theft from illegal marijuana grow operations, and (ii) the decrease in the overall number of illegal marijuana grow operations on its network resulting from the AMI project.

## Response:

FortisBC does not believe it is possible to accurately measure or verify the two factors identified in the question. Please also refer to the response to BCUC IR No. 2 Q41.4.
65.1.2 Does FortisBC consider that the level of accuracy in measuring (i) the decrease in theft from illegal marijuana grow operations, and (ii) the

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decrease in the overall number of illegal marijuana grow operations on its network resulting from the AMI project is sufficient to consider performance based regulatory mechanisms for this project? If no, please explain how ratepayers can be assured that projected benefits will materialize.

## Response:

FortisBC believes that the theft detection effectiveness indicators proposed in its response to BCUC IR No. 1 Q56.3 can be measured with a high degree of accuracy. However, the theft deterrence benefits would be very difficult to measure accurately. Please also refer to the responses to BCUC IR No. 2 Q41.3 and 41.4.

FortisBC ratepayers should be assured that the theft detection benefits have been conservatively estimated using the best information available to FortisBC, and that those benefits will have been tested by an extensive and thorough public regulatory review process.
65.2 Please describe the methodology FortisBC plans to use to allocate AMI costs between customer classes in its fully allocated cost of service study.

## Response:

Capital expenditures related to the AMI project will be treated in the next cost of service analysis (COSA) in a manner consistent with any capital project undertaken by the Company.

As components such as the AMI meters come into service the associated costs are added to the appropriate cost accounts consistent with the BCUC Uniform System of Accounts. The costs in these accounts are classified and allocated in the COSA using the factor deemed appropriate.

For example, the cost of meters in the most recent COSA was allocated between customer classes on the basis of customer meter count weighted by the average cost of the particular class' meters. In this way, as the average cost of residential meters increases due to the higher cost of AMI meters, an increasing share of the total meter costs is allocated to the residential class.

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65.2.1 Does FortisBC consider that cost causation should be the foundation of rate setting? If no, please explain why not.

## Response:

The Company notes that there is a distinction between the FEU quote contained in the reference, ("...cost causation should be a foundation of rate setting...") and the statement it is now being asked to comment upon. ("...cost causation should be the foundation of rate setting...)

FortisBC agrees with the FEU statement which notes that cost causation should be a foundation of rate setting and further, that it is properly considered in balance with other rate setting objectives such as those articulated by Bonbright as discussed previously in various rate-related Commission proceedings.

Bonbright's criteria provide the appropriate general framework for ratemaking. As Bonbright made clear, key objectives are revenue sufficiency, equity, and efficiency (Criteria 3, 6, and 8). Also important are rate stability (Criterion 6) and the practical attributes of simplicity, understandability, public acceptance, and feasibility of application (Criterion 1). ${ }^{25}$
65.2.2 Does FortisBC consider that, if, say $50 \%$ of AMI benefits relate to theft reduction, $50 \%$ of AMI costs should be allocated to customer classes on the basis of energy consumption? If no, please explain why not. If yes, please explain if the FortisBC proposed approach to allocate AMI costs between customer classes in the fully allocated cost of service study is consistent with this approach.

## Response:

The Company believes that AMI costs should be allocated in the manner described in the response to BCUC IR No. 2 Q65.2.

Although there are direct financial benefits of AMI due to theft detection, such as reduced power purchases, there are also indirect financial benefits such as those resulting from the reduced

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overloading of equipment that are more difficult to quantify. In addition, there are non-financial benefits (such as outage restoration) that cannot be quantified that benefit all customers.

The general rate mitigation provided by the AMI project accrues to all classes and will inherently fall to each class on the basis of kWh consumption.

In the opinion of the Company there is no compelling reason to deviate from standard COSA methodology in the treatment of AMI costs.

### 66.0 Reference: Marijuana Grow Operations - General <br> Exhibit B-6, BCUC IR 1.86.1, Appendix 1, p. 7 <br> Safety and Emission Considerations

Professor Boyd states in Appendix 1 to BCUC IR 1.86.1 on page 7:
"If the local governments within the area served by FortisBC adopt the approach made possible by the Act of 2006, .... we may see a significant percentage of growers consider the theft of alternative forms of energy - gas and propane, along with off the grid possibilities such as generators. In this circumstance public safety will be placed at greater risk ... "
66.1 To what extent, if any, does FortisBC consider that there could be additional safety and/or emissions concerns from the status quo or AMI scenario related to a move of illegal marijuana grow operations from electricity to non-renewable energy sources for lighting? Please explain.

## Response:

The Easton Policy Paper filed in response to BCUC IR No. 1 Q74.1 outlines the link between risk and reward for marijuana producers. Producers will logically choose the least risk alternative to supply energy to their business. If the risk of using alternative energy sources is deemed to be lower than the use of electricity then producers will move to those sources.

FortisBC is aware of 4 illegal marijuana production sites in the last year that have been dismantled by the RCMP where diesel or gas fired generators were in use to supply the energy required for the operation. Two of those sites involved the theft of natural gas. The use of these fuels in this context presents additional emissions and safety concerns for the general public as noted by Professor Boyd. FortisBC does not have the expertise to assess whether the safety risks of using non-renewable energy for lighting are greater than that for electricity diversions.

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### 67.0 Reference: Conservation benefits

## Exhibit B-6, BCUC IR 1.107.1, 1.110.6

## Framework

## FortisBC states in BCUC IR 1.107.1:

"Given that the electric system is designed and built to accommodate the peak aggregate load of the Company's customers, FortisBC considers that successfully reducing customers' total demand and shifting usage to off-peak hours will provide such benefits as:

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

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

FortisBC states in BCUC IR 1.110.6:
"FortisBC believes that all costs to customers should be considered (and quantified where it is possible to do so with reasonable accuracy) when evaluating whether conservation rates provide a net benefit to customers."
67.1 Does FortisBC consider that conservation benefits from AMI can be described as 'facilitating initiatives which mitigate market barriers to efficient customer investment and consumption decisions'? If no, please explain why not.

## Response:

In developing its DSM Plan and individual programs, FortisBC considers and addresses a number of market barriers that prevent customers from taking advantage of cost-effective measures or behavioural opportunities to save energy:

- Awareness - customers lack information on their energy usage or patterns, or are not aware more efficient technology or behaviours;
- Availability - the more efficient technology or process is not available on the market;
- Accessibility - the more efficient technology of process is not easily accessible to all customers;
- Affordability - the higher first cost of a more efficient technology or process prevents customers from adopting it, even though it is cost-effective over time;
- Acceptance - customers do not like the more efficient technology or process; and
- Advocacy - social norms promoting behavioural change, e.g. use of clotheslines.

Since the AMI project is expected to increase awareness customer awareness of usage and patterns through their use of the Customer Information Portal, and optional In-Home Displays, it will aid in addressing the first market barrier listed above.
67.2 Does FortisBC consider that the key conservation related initiatives which AMI facilitates are: (i) enhanced consumption information through the online customer information portal; (ii) enhanced consumption information through an in-home information display (IHD); (iii) time-of-use rates (TOU); and (iii) critical peak pricing rates (CPP)? If no, please explain why not.

## Response:

FortisBC agrees that (i) and (ii) are key conservation -related initiatives without qualification, however the future benefits of (iii) and (iv) will only become available if and when TOU and/or CPP rates have been filed and approved.
67.3 Does FortisBC consider that, in order for the initiatives identified above to provide a net benefit to $B C$, Fortis $B C$ should demonstrate that:

- there is a market failure to begin with regarding when and how much electricity is used by a customer. For example, if customers had perfect information regarding FortisBC incremental costs and externalities, and responded efficiently to these pricing signals, would they consume less electricity and/or at different times compared to the

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status quo? (Effectively what the Total Resource Test (TRC) aims to measure); and

- it is lower cost to the utility to undertake program(s) to address the market barrier, than to supply the additional energy/demand resulting from the market failure. (Effectively what the Utility Cost Test (UCT) aims to measure).


## Response:

AMI will address two important barriers to more efficient energy use:

- Electricity consumption information. AMI will provide more complete and more timely information regarding electricity use than the current system which provides aggregate consumption on a monthly or bi-monthly basis. It is a matter for debate as to whether the current system constitutes a "market failure", but research contained in Exhibit B-1, Appendix C-1 with respect to IHD's indicates that consumption will be lower with better information.
- Time-varying rates. Electricity cannot economically be stored and so must be generated and transmitted to the end user in direct proportion to the varying demand. This requires generation, transmission and distribution infrastructure that is capable of meeting instantaneous peak demand. AMI metering technology will allow the implementation of rates that track the time-varying costs of generating and transmitting electricity. These type of rates are demonstrated to reduce consumption as shown in the research contained in Exhibit B-1, Appendix C-1.

With the current low marginal energy prices, it is not clear whether it is lower cost (as measured by the change in average customer rates) for the utility to address the above barriers than it is to supply the additional energy/demand resulting from the "market failure".
67.4 Does FortisBC consider that a high level of free riders indicates an initiative is not effective at addressing a market failure? If no, please explain why not.

## Response:

DSM program design endeavours to address market barriers including known market failures (for example the landlord-tenant DSM incentive issue). There are a number of possible causes for a high free-rider rate, not just market failure. These causes include DSM program design,
measure pricing, change in baseline, codes and standards and/or the stage of market transformation. Thus, a high level of free-riders may in fact indicate program success (for example, market transformation has occurred and the DSM initiative can be discontinued).
67.5 Does FortisBC consider that the key tests to determine if there is a conservation benefit from AMI are listed below? If no, please explain why/why not.

- Determining if there is a market failure with regards to when customers use electricity, and if so, if TOU/CPP rates are a cost effective way of mitigating that market failure; and
- Determining if there is a market failure as to how much electricity is used by customers, and is so, if customer information portals/IHD are a cost effective way of mitigating that market failure.


## Response:

Please refer to the response to BCUC IR No. 2 Q67.3.
67.6 Does FortisBC consider that, if there is a BC benefit from AMI with regards to when customers use electricity, then the net benefit to BC can be estimated as the avoided utility generation/network cost (plus any related non-financial benefit to participating customers), less (i) the direct and indirect cost to customers of shifting consumption (or decreasing consumption during peak hours), and (ii) any utility implementation costs. Incentive credits to the customer and incentive costs to the utility would be excluded as they are a wealth transfer. If no, please explain why not and describe/justify an alternative approach.

## Response:

FortisBC considers the approach to estimating the conservation benefit to be reasonable, but not necessarily easy to calculate. For example, although there may be an indirect cost to customers of shifting consumption, this cost is not easily estimated. Please also refer to the response to BCUC IR No. 2 Q67.3.
67.7 Does FortisBC consider that, if there is a BC conservation benefit from AMI with regard to how much electricity is used by customers, then the net benefit to $B C$ is the avoided delivered long-run supply costs (plus any related non-financial benefit to participating customers), less (i) the direct and indirect cost to customers of reducing consumption, and (ii) any utility implementation costs? Incentive credits to the customer and incentive costs to the utility would be excluded as they are a wealth transfer. If no, please explain why not and describe/justify an alternative approach.

## Response:

FortisBC considers the approach to estimating the conservation benefit to be reasonable, but not necessarily easy to calculate. For example, although there may be an indirect cost to customers of reducing consumption, this cost is not easily estimated. Please also refer to the response to BCUC IR No. 2 Q67.3.

### 68.0 Reference: When customers use electricity

Exhibit B-6, BCUC IRs 1.107.4, 1.107.4.1, 1.108.1, 1.109.1.3.1, 1.111.2.1, 1.107.2.2, 1.107.4.3

Determining if there is a problem
In BCUC IR 1.107.4, FortisBC was asked to estimate how much money a residential customer with average consumption volume would save in one month if they shifted 10 percent of their consumption from peak to off-peak periods in 2012, assuming the customer is on a FortisBC residential TOU tariff where the peak: off-peak $\Phi / \mathrm{kWh}$ difference is set equal to the peak: off-peak $\$ / k W h$ difference forecast in the Midgard $B C$ Wholesale Market Energy Curve. FortisBC estimated the customer saving in this scenario at $22 \Phi$ /month:

|  | Before Shifting Consumption |  |  | After Shifting Consumption |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  | Usage <br> $(\mathrm{kWh})$ | Rate | Cost |  | Usage <br> $(\mathrm{kWh})$ |  | Rate |

In BCUC IR 1.107.4.1, FortisBC undertook the same analysis for each year up to 2030. Maximum monthly savings were achieved in 2020, with a saving of $47 \$ /$ month.

FortisBC states in BCUC IR 1.108 .1 "In any case, the ability to economically address future capacity gaps on a planning basis through the introduction of residential TOU rates is uncertain."

FortisBC states in BCUC IR 1.109.1.3.1 "FortisBC is not forecasting "very high critical peak prices" in its resource plan, so it cannot estimate when CPP could become a viable option on this basis."
FortisBC states in BCUC IR 1.111.2.1: "The total [avoidable network investment] costs are composed of many individual projects that may cover an area as small as a portion of distribution feeder or an area as large as the north or south Okanagan. Thus, to have any impact on future projects that support growth in an area, any load reductions would need to be specific to the area covered by those individual projects."

FortisBC states in BCUC IR 1.107.2.2:
"A comparison of [peak/off-peak TOU] prices is not possible because neither the FortisBC AMI Application nor the Navigant report use a set of TOU prices as a basis for estimating the customer participation rate or capacity and energy savings attributable to the introduction of the conservation rate."

In BCUC IR 1.107.4.3 FortisBC states "... the Company does not view the assumptions used by Navigant to be optimistic."
68.1 Does FortisBC consider that the evidence supports an assumption that customers are not being inefficient in regards to when they consume electricity over (i) the next 5 years, and (ii) the term of the project? If no, please explain why not.

## Response:

Assuming that the question can alternately be posed as, "Does FortisBC consider that the evidence supports an assumption that customers are being efficient in regards to when they consume electricity...", then the answer is yes. The Company has no basis on which to conclude that customers are making inefficient decisions regarding consumption. It is assumed that customers respond to the price signals that are contained in whatever price regime is in place in a manner that values the unit price of power with the perceived value derived from its consumption. FortisBC makes this assumption regardless of the timeframe involved.
68.2 If FortisBC considers that customers in certain areas may be inefficient in regards to when they consume electricity (for example, those located at the end of a network constraint), please describe (i) the specific area(s), (ii) percentage of load which would need to be shifted to off-peak periods and minimum customer participation rate to achieve the utility cost reduction, and (iii) an estimate of participating customer bill savings assuming all utility cost savings were passed through to participating customers. Please state all assumptions made.

## Response:

FortisBC is unable to provide the requested information; as discussed below, there are too many unknowns at the present time.

With respect to question (i) relating to "the specific area(s)" where there may be network constraints, FortisBC notes that it currently addresses deficiencies in transmission and distribution capacity through a number of projects and programs in its two year Capital Expenditure Plan (CEP) filings. When possible, major distribution upgrades are specifically identified and included as separate line items. Smaller upgrade projects are included in the "Distribution Line Small Growth" and "Distribution Line Unplanned Growth" programs. The total budget for these two ongoing programs is approximately $\$ 2$ million per year and is used to address numerous localized capacity issues which occur throughout the service territory over the period of the CEP. However, given the uncertainty around area-specific load growth, FortisBC is unable to identify the scope and location of these projects beyond approximately 3 to 4 years. Given that the AMI project will not be complete until 2016, the distribution projects which would be affected by time-based rates or other load-shifting measures are not yet known or identified.

Since FortisBC does not know which areas would need to be affected by load shifts due to timebased rates, it is also not possible to determine the answer to question (ii) around the "percentage of load which would need to be shifted". Although there are a number of transmission growth projects scheduled for the time frame following the implementation of AMI, these projects are also subject to timing variances due to changes in load forecasts. Further, FortisBC expects load shifting from peak to off-peak times to only result in the temporary deferral of transmission growth projects. As the area load continues to grow, the projects would still be required at some point. Hence it is not the total cost of the project which would be "saved", but rather the carrying costs associated with deferring the work that would be saved.

Given the load uncertainties and unknown costs described above FortisBC is thus also unable to answer question (iii) "an estimate of participating customer bill savings assuming all utility cost savings were passed through to participating customers". FortisBC also notes that under the current regulatory model, any time-based rates and load-shifting measures would be
available to all customers and any resulting capital cost savings would be shared by all customers. FortisBC is concerned by the wording of the question that the use of area-specific time-based rates and load-shifting measures are being suggested; this would be significant departure from the current "postage stamp" principles which have been successfully employed in British Columbia for many years.
68.3 Is it FortisBC's position that the size of potential bill savings from a shift in consumption from peak to off-peak periods is not a significant relevant consideration in estimating customer uptake and response to a TOU rate (other than for those who would be free-riders)? If yes, please explain why. If no, please explain if FortisBC considers the Navigant report to provide useful evidence regarding expected customer uptake and response to a TOU/CPP rate for this Application, and if so why.

## Response:

FortisBC believes that the AMI system will enable optional rates such as TOU, however this AMI Application does not contain a proposal for TOU/CPP rates. In its conclusions, the Navigant report indicates that such rate structures will in turn engender energy savings - in addition to load shifting benefits. If and when an application for such optional rates is filed these specific arguments can be further addressed through due process.

FortisBC does believe that potential bill impact (positive and negative) is relevant to the eventual uptake to a TOU or CPP rate primarily due to the fact that historical consumption patterns and current pricing will be readily available making an assessment of either free-rider benefit or cost benefit analysis an easy exercise.

### 69.0 Reference: When customers use electricity

Exhibit B-6, BCUC IR 1.107.5
Determining if TOU/CPP is an effective way to address the problem
In BCUC IR 1.107.5, FortisBC addressed the issue of 'free-riders' (for example, customers who consume more energy than average at the higher Tier-2 price and who may see significant bill savings from a switch to a TOU rate without making any changes to their consumption pattern). FortisBC responded that:

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"The Company considers that a certain amount of free-ridership is going to occur on any conservation rate that it may implement. ... The Company does not expect however that bill savings would be "significant". Using the assumptions provided in the responses to BCUC IR 1 Q107.4, and the current RCR rate, (also revenue neutral to the 2012 flat rate), the savings attributed to a customer moving from RCR to TOU with no change in behaviour (assumed 40 percent consumption is on-peak) is shown in the table below:"

Table BCUC IR1 Q107.5 - RCR and TOU Bill Comparisons

|  | Residential Conservation Rate |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Monthly Consumption | Threshold | Tier 1 rate | Tier 2 rate | Customer Charge | Energy Charges | Total |
| 1300 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 123.93 | \$ 153.58 |
| 1350 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 129.82 | \$ 159.47 |
| 1400 | 800 | 0.08136 | 0.11769 | \$ 29.65 | \$ 135.70 | \$ 165.35 |
| 1450 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 141.59 | \$ 171.24 |
| 1500 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 147.47 | \$ 177.12 |
| 1550 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 153.36 | \$ 183.01 |
| 1600 | 800 | 0.08136 | 0.11769 | \$ 29.65 | \$ 159.24 | \$ 188.89 |
| 1650 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 165.12 | \$ 194.77 |
| 1700 | 800 | 0.08136 | 0.11769 | \$ 29.65 | \$ 171.01 | \$ 200.66 |
| 1750 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 176.89 | \$ 206.54 |
| 1800 | 800 | 0.08136 | 0.11768 | \$ 29.65 | \$ 182.78 | \$ 212.43 |
| 1850 | 300 | 0.08136 | 0.11769 | \$ 29.65 | \$ 188.66 | \$ 218.31 |


| Time of Use Rate (e40\% on peak) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| On-Peak <br> Rate | Off-Peak Rate | On-Peak <br> Usage | off-Peak Usage | Customer Charge | Energy <br> Charges | Total |
| 0.09763 | 0.08236 | 520 | 780 | \$ 30.07 | 122.81 | \$ 152.88 |
| 0.09763 | 0.08236 | 540 | 810 | \$ 30.07 | 127.53 | \$ 157.60 |
| 0.09763 | 0.09236 | 560 | 840 | \$ 30.07 | 132.26 | \$ 162.33 |
| 0.09763 | 0.09236 | 580 | 870 | \$ 30.07 | 136.98 | \$ 167.05 |
| 0.09763 | 0.09236 | 600 | 900 | \$ 30.07 | 141.70 | \$ 171.77 |
| 0.09763 | 0.09236 | 620 | 930 | \$ 30.07 | 146.43 | \$ 176.50 |
| 0.09763 | 0.09236 | 640 | 960 | \$ 30.07 | 151.15 | \$ 181.22 |
| 0.09763 | 0.08236 | 660 | 990 | \$ 30.07 | 155.87 | \$ 185.94 |
| 0.09762 | 0.08236 | 689 | 1020 | \$ 30.07 | 160.60 | \$ 190.67 |
| 0.09763 | 0.08236 | 700 | 1050 | \$ 30.07 | 165.32 | \$ 195.39 |
| 0.09763 | 0.08236 | 720 | 1080 | \$ 30.07 | 170.04 | \$ 200.11 |
| 0.09763 | 0.08236 | 740 | 1110 | \$ 30.07 | 174.77 | \$ 204.84 |


|  |  |
| :--- | ---: |
| Difference |  |
|  |  |
| $\$$ | 0.70 |
| $\$$ | 1.87 |
| $\$$ | 3.03 |
| $\$$ | 4.19 |
| $\$$ | 5.35 |
| $\$$ | 6.51 |
| $\$$ | 7.67 |
| $\$$ | 8.83 |
| $\$$ | 9.99 |
| $\$$ | 11.15 |
| $\$$ | 12.32 |
| $\$$ | 13.48 |

69.1 Please confirm that, for a residential TOU rate as modeled in BCUC IR 1.107.4, typical bill savings from free riders can be significantly higher than bill savings from a customer who shifts $10 \%$ of consumption onto off-peak periods. If no, please explain why not.

## Response:

The Company considers a free rider to be a customer who benefits from a move from the existing default rate to a conservation rate without a change in behaviour. The Company can confirm that if a customer were to switch from the default Residential Conservation Rate (RCR) to the TOU Rate (as specified) and subsequently shifts $10 \%$ of consumption to the off-peak period, most of the bill reduction would result from the free-ridership. This can be seen in the table below.

Using the same assumptions as in the response to BCUC IR1.107.4 it can be seen that for a customer using 1500 kWh per month, the RCR consumption charges would be $\$ 147.47$. The same customer, with a move to the TOU rate and assuming no change in a $40 / 60$ on-peak/offpeak consumption pattern would pay $\$ 141.70$. Shifting consumption $10 \%$ into the off-peak period would lower the bill further to $\$ 140.91$. A comparison of columns $f$ to $d$ shows that most of the bill reduction is due to free-ridership. This result is of course dependent on the constraint placed on the pricing design and a greater allowable spread in the on-peak/off-peak price would yield a different outcome.

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|  | a | b | C | $d=a-b$ | $\mathrm{e}=\mathrm{c}-\mathrm{a}$ | $f=e-d$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Monthly Consumption (kWh) | Usage Charges on RCR | Usage Charges on TOU (40\% Peak) | Usage Charges on TOU (30\% Peak) | Free Ridership Savings | Free <br> Ridership <br> Savings plus <br> Shifting | Incremental <br> Shifting <br> Savings |
| 1300 | 123.93 | 122.81 | 122.12 | 1.12 | 1.81 | 0.69 |
| 1350 | 129.82 | 127.53 | 126.82 | 2.29 | 3.00 | 0.71 |
| 1400 | 135.70 | 132.26 | 131.52 | 3.45 | 4.18 | 0.74 |
| 1450 | 141.59 | 136.98 | 136.21 | 4.61 | 5.37 | 0.76 |
| 1500 | 147.47 | 141.70 | 140.91 | 5.77 | 6.56 | 0.79 |
| 1550 | 153.36 | 146.43 | 145.61 | 6.93 | 7.75 | 0.82 |
| 1600 | 159.24 | 151.15 | 150.31 | 8.09 | 8.93 | 0.84 |
| 1650 | 165.12 | 155.87 | 155.00 | 9.25 | 10.12 | 0.87 |
| 1700 | 171.01 | 160.60 | 159.70 | 10.41 | 11.31 | 0.90 |
| 1750 | 176.89 | 165.32 | 164.40 | 11.57 | 12.50 | 0.92 |
| 1800 | 182.78 | 170.04 | 169.09 | 12.74 | 13.68 | 0.95 |
| 1850 | 188.66 | 174.77 | 173.79 | 13.90 | 14.87 | 0.97 |

69.1.1 Does FortisBC consider that the results above indicate a significant free-rider risk associated with an optional TOU rate? If no, please explain why not.

## Response:

No. The results above are all derived from monthly consumption totals that are all in excess of the average for FortisBC's residential customers and even at that represents a free-rider benefit of just $6.5 \%$ (of TOU bill) at the upper end. At the average consumption level of 1040 kWh the TOU bill would be $\$ 5.33$ higher under the same assumptions. In addition, the pricing model specified by the Commission may or may not be indicative of any final approved TOU rate so generalizing a conclusion on an optional TOU on this basis is not appropriate.

### 70.0 Reference: How much electricity is used

## Exhibit B-1, Tab 3, Section 3.2.4, p. 32; Exhibit B-6, BCUC IR 1.28.1.1 Determining if there is a problem

FortisBC states on page 32 of the Application:
"The AMI system allows customers to access billing information through the online customer information portal or an IHD, providing them with more detailed information about their energy consumption, including both the timing and amount of energy consumed."

FortisBC states in BCUC IR 1.28.1.1:
"The Total Resource Cost Benefit/Cost (B/C) ratio of an IHD measure is calculated as 1.6 , based on a unit cost of $\$ 150$. The Utility Cost Test $B / C$ ratio is 4.2 , with a simple payback of one year on the $\$ 50$ incentive paid to a customer."
70.1 Please provide a brief overview of the types of customer investment decisions (for example, lighting, appliances) and customer consumption decisions (for example, not turning off lights/heating when no longer required) that provide support for an assumption that there are market failures with regards to how much electricity customers consume.

## Response:

FortisBC can only speculate as to how customers may use the information from the Customer Information Portal and In-Home Display to change their investments and behaviour related to energy use. An incomplete list would include:

- A residential customer is surprised to see how much energy their air conditioner uses when it's on, prompting the customer to adjust the thermostat setting when they leave the house.
- A residential customer is surprised to see how much energy heating takes, prompting the customer to invest in a heat pump.
- A residential customer is surprised to see how much energy their clothes dryer uses, prompting the customer to use the FortisBC laundry line they picked up at a community PowerSense event.
- A small business owner sees how much energy is being used while the store is closed, prompting them to turn off the computers and the air conditioning when closing.
- The owner of a manufacturing plant notices that their demand charges have increased over the previous year. Using data from the AMI meter, they identify that the peak is being caused at 8am when they now start up two machines at the same time. They change the work schedule so that the machines now start 30 minutes apart.
70.2 Please provide evidence that a customer is being inefficient by not investing in an IHD. Please include in this response a TRC calculation for this initiative, using the long-run marginal cost of delivered energy as the avoided utility cost, the IHD cost as a customer cost, and exclude any incentive from utility/customer costs. Please describe (and quantify where possible within the TRC) any additional costs a customer may incur in order to achieve the assumed conservation (such as investment in more efficient lighting/heating, health/comfort impacts from changing home temperature settings), less any associated non-energy benefits. Please state all assumptions made.


## Response:

FortisBC would not characterize customer behaviour as "inefficient". Customer behaviour with respect to electric use is predicated largely upon the consumption information and price signals received from the utility. That said, there is an opportunity to improve the consumption information and price signals available to customers through AMI.

The FortisBC 2010 Conservation and Demand Potential Review, which was filed as Appendix C of the 2012 Integrated System Plan, indicated that 116 GWh of Achieveable Potential was possible through Behavioural Programs. An in-home display is a tool or measure that enables customers to achieve energy savings through behavioural change or response to the electricity usage information provided via the IHD.

The Benefit/Cost tests table that follows is based on the following inputs:

- 750 kWh energy savings, including line losses
- Five year measure life
- 8\% discount rate
- $\$ 150$ measure cost
- \$85/MWh levelized avoided power purchase cost

There were no quantifiable non-energy benefits, or costs, factored into this TRC test. Please see the response to BCUC IR No. 2 Q70.1 for examples of customer investments and behaviour changes that may be driven by improved energy conservation information.

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| Cost Benefit Sum mary |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :---: |
|  |  |  |  |  |

Table BCUC IR2 Q70.2

### 71.0 Reference: How much electricity is used

Exhibit B-6, BCUC IR 1.28.1.1; FortisBC Powerlines newsletter, November 2007, p. 2
Determining if enhanced billing/IHD is an effective way to address the problem

FortisBC states in BCUC IR 1.28.1.1:
"The Total Resource Cost Benefit/Cost (B/C) ratio of an IHD measure is calculated as 1.6 , based on a unit cost of $\$ 150$. The Utility Cost Test $B / C$ ratio is 4.2 , with a simple payback of one year on the $\$ 50$ incentive paid to a customer."
A FortisBC November 2007 Powerlines newsletter states on page 2: ${ }^{26}$
"The Blue Line monitor, no bigger than two playing cards, plugs into an outdoor electricity meter. The meter displays usage by cents per hour, a graphic of the running

[^14]meter, the total cost since the meter has been in place, as well as the temperature outside the home. ...

In 2007 FortisBC plans to expand the Blue Line monitor trial to include 100 homes across its service territory to assess the value that this type of technology will have for its customers."
71.1 Please describe the specific problem, in regards to inefficient consumption levels only, which (i) an online customer information portal and (ii) IHD is expect to address (for example, lack of customer awareness as to the amount of electricity consumed by certain equipment or as a result of certain actions).

## Response:

Please see the responses to BCSEA IR No. 1 Q43.1 and BCUC IR No. 2 Q70.1 for examples of how an IHD may be used.
71.2 Please describe alternative approaches used in other jurisdictions to address this problem, and why FortisBC is not proposing these options instead. Please include in this response a description FortisBC Blue Line monitor trial and the results.

## Response:

The Blue Line energy monitor was the ubiquitous IHD tool reported in the meta-review contained in the Navigant report. FortisBC is only aware of a single CIP study, done for Cape Light Compact ${ }^{27}$, and will be incorporating CIP functionality as part of the AMI system.

The FortisBC Blue Line monitor trial in 2007 revealed the devices were problematic during initial set-up (the pickup alignment with the analog meters revolution disk or digital meters pulse LED was finicky and could easily be knocked out of alignment). They required ongoing maintenance (the sending unit battery was fairly unique, expensive and required change-out as often as twice a year) which was inconvenient. Anecdotal user comments indicated either initial enthusiasm or skepticism. Finally the installation date seldom coincided with the customers' billing periods, thus prompting queries about the difference between the Blue Line monitor kWh usage

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compared to the revenue meter consumption reports. Due to these various issues a full pilot with a hundred customers, complete with a control group, was not undertaken.

ZigBee-connected IHDs are expected to address many of the issues experienced.
71.2.1 Please describe (and quantify where possible) the costs/benefits of the IHD product proposed for the Power Smart project with (i) the Blue Line monitor and (ii) other similar products on the market that do not require AMI

## Response:

Based on the limited Blue Line field trial experience referred to in response to BCUC IR No. 2 Q71.1, the operating costs of replacing the special battery twice a year would make the benefitcost ratio marginal, and if labour costs (to change the battery) were added the measure would fail. Nevertheless, FortisBC considers the Blue Line monitor to be a viable (but not superior) alternative to a ZigBee-based IHD. Please also refer to the response to BCSEA IR No. 2 Q87.3.
71.2.2 Please describe (and quantify where possible) the costs/benefits of the online customer information portal with other similar products that do not require AMI.

## Response:

The Blue Line Innovations PowerCost Monitor (starting at a little over \$100) costs more than the least expensive ZigBee IHDs, but is roughly comparable. However, because the batteries in the transmitter have to be replaced regularly, the operating cost (and hassle factor) make the Blue Line direct and indirect costs higher.

FortisBC is not aware of similar products to the Blue Line PowerCost Monitor.

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71.3 Please provide the Utility Cost Test analysis for (i) an online customer information portal and (ii) the IHD proposal. Please describe all assumptions used, and use the long-run marginal cost of delivered energy as the utility cost. Please include the IHD incentive as a cost to the utility.

## Response:

(i) The following table presents the UCT for the on-line customer information portal (CIP), based on the CIP savings stream presented in Table BCUC IR No. 1 Q16.1 and calculating the NPV using the $\$ 85 / \mathrm{MWh}$ long-run marginal cost approved for the 2012/13 DSM Plan.
(ii) Please see response to BCUC IR No. 2 Q70.2 for the IHD tests, including the Utility Cost Test.

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71.4 For the IHD proposal, has FortisBC surveyed other utilities to determine why, or why not, they promote IHDs for their customers? If yes, please describe the process undertaken and the results. If no, please explain why not.

## Response:

For IHD planning purposes FortisBC has applied the findings of the Navigant report, in order to determine a program Total Resource Cost. The Company will do additional research, such as surveying other utilities, before program design and customer communication plans are finalized.

### 72.0 Reference: How much electricity is used

Exhibit B-6, BCUC IR 1.28.1.1

## Quantifying the benefit

FortisBC states in BCUC IR 1.28.1.1:
"The Total Resource Cost Benefit/Cost (B/C) ratio of an IHD measure is calculated as 1.6 , based on a unit cost of $\$ 150$. The Utility Cost Test $B / C$ ratio is 4.2 , with a simple payback of one year on the $\$ 50$ incentive paid to a customer."
72.1 Please estimate, and provide a justification for, residential customer use of/uptake of a (i) online customer information portal, and (ii) IHD.

## Response:

These questions have been addressed in the following prior responses:

- Exhibit B-1, Appendix C-1 for studies related to IHD savings
- BCUC IR No. 1 Q8.2 for forecast adoption rates for Customer Information Portal ("CIP") and IHD
o BCSEA IR No. 1 Q45.1 data sources for forecast adoption rates
- BCPSO IR No. 1 Q11.1 for CIP ramp rate
- BCSEA IR No. 1 Q15.2 for IHD ramp rate
- BCUC IR No. 2 Q70.1 for ways in which CIP and IHD could be used by customers to save energy
- BCUC IR No. 1 Q28.1.2 for IHD availability
- BCSEA IR No. 1 Q43.3 for ways in which CIP and IHD will be promoted to customers
- BCSEA IR No. 1 Q15.3 for justification of $30 \%$ IHD adoption rate
- BCSEA IR No. 1 Q42.2 for tabular IHD savings (MWh and savings)
- BCUC IR No. 1 Q16.1 for tabular CIP savings (MWh and savings)
72.2 Using the TRC input data calculated in IR 70.2, and the customer uptake assumptions above, please estimate the NPV to BC of (i) an online customer information portal, and (ii) an IHD as it relates to energy conservation over the life of the project.

Please use the long-run marginal cost of delivered energy as the avoided utility cost, the IHD cost as a customer cost, and exclude any incentive from utility/customer costs. Please describe (and quantify where possible within the analysis) any additional costs a customer may incur in order to achieve the assumed conservation (such as investment in more efficient lighting/heating, health/comfort impacts from changing home temperature settings), less any associated non-energy benefits. Please state all assumptions made

## Response:

For clarification the following responses estimate the NPV (net benefits) for FortisBC and its customers, not for the entire province. No non-energy benefits (or costs) are quantifiable or used in the estimations.
(i) Please see the table provided in response to BCUC IR No. 2 Q71.3. The incremental AMI NPV of avoided power purchase costs for the Customer Information Portal is $\$ 3.8$ million. The net benefits from a TRC perspective, assuming the "total" cost customer and Company costs of implementing the Customer Information Portal (BCUC IR1 Q8.1.3) is deducted, is $\$ 3.6$ million.
(ii) Using the data provided in response to BCSEA IR No. 1 Q42.2, the incremental AMI NPV of the IHD avoided power purchase benefits is $\$ 7.4$ million. The net benefits from a TRC perspective, assuming a "total" NPV of customer and Company costs of $\$ 2.8$ million (NPV of 30,000 IHDs over the life of the Project at $\$ 160$ per IHD) is deducted, is $\$ 4.6$ million.
72.2.1 If FortisBC does not consider the assumptions used are reasonable, please explain why and provide additional NPV analysis using

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assumptions considered more appropriate by FortisBC. Please justify the assumptions used.

## Response:

FortisBC considers the assumptions used to be reasonable.
72.3 Does FortisBC consider that there will be any additional social or environmental impacts related to an online customer information portal/IHD proposal? If yes, please describe.

## Response:

FortisBC believes that the information provided by the CIP and IHD is a step towards building a "conservation culture", as envisioned by the 2007 BC Energy Plan. The type of actions described in the response to BCUC IR No. 2 Q70.1 could be characterized as having positive social or environmental impacts.
72.4 Please describe (and quantify where possible) the effect on the estimated NPV of benefit to BC of a 5 year delay in the AMI project for the (i) online customer information portal, and (ii) IHD proposal. Please state all assumptions used.

## Response:

The AMI Project as proposed does not include any claimed benefits for either the online customer information portal (please refer to BCUC IR1 Q16.2), or IHDs (please refer to CSTS IR1 Q40.3). Therefore, delaying them would not impact the estimated NPV of benefit to FortisBC customers.

If both benefits were included in the business case (without a delayed implementation), the NPV of the AMI project would rise by approximately $\$ 3.8$ million related to the customer information portal and by approximately $\$ 7.4$ million related to the IHD's (NPV was incorrectly stated as $\$ 9.8$ million in CEC IR1 Q61.1). This would increase the NPV for the AMI project to approximately $\$ 28.8$ million.

Delaying the customer information portal by five years would reduce the NPV benefit to $\$ 2.6$ million ( $\$ 3.8$ million discounted for five years at 8\%).

Delaying the IHD implementation by five years would reduce the NPV benefit to $\$ 5.0$ million (\$7.4 million discounted for five years at 8\%).

### 73.0 Reference: How much electricity is used

Exhibit B-6, BCUC IRs 1.110.5, 1.110.5.1
Pre-pay meters
FortisBC confirms in BCUC IR 1.110.5 that it is possible to have pre-pay meters without AMI infrastructure in place.

FortisBC states in BCUC IR 1.110.5.1 that "Pre-pay rates are considered a future benefit since they require further analysis and are not proposed as part of the AMI project."
73.1 Does FortisBC consider that because pre-pay meters can be provided to customers without AMI, the net benefit to BC of AMI as it relates to pre-pay meters is the lower of:

- Cost savings: the cost difference between pre-pay meters if AMI was not installed, and pre-pay meters if AMI was installed; and
- Net benefits from lowest cost option: the utility and customer benefit from pre-pay meters (including any non-financial benefits), less associated costs, under the AMI scenario?

If no, please explain why not.

## Response:

No, FortisBC does not agree. FortisBC has not included any benefit from pre-pay meters in the financial analysis of the AMI project.

When the business case for pre-pay is developed, it will be based on the incremental costs and benefits related to the implementation of pre-pay on the existing AMI system. This will represent the most realistic financial analysis from a revenue requirement and customer rate perspective. Leveraging the existing AMI system will also be the most economic pre-pay option for customers since implementation of pre-pay without AMI would require a separate dedicated communication infrastructure to be installed to pre-pay customers' homes.
73.2 Please provide an estimate of the cost of a pre-pay meter (i) with AMI; and (ii) without AMI.

## Response:

FortisBC has responded previously about the extent to which the installation of prepay meters has been investigated to date, stating in the response to BCUC IR No. 1 Q103.1,

As indicated in the Application at Tab 6.0, Section 6.4, p 103, "If AMI is approved, FortisBC intends to fully investigate the potential development costs and potential savings associated with a pre-pay system. If warranted, a proposal for a prepay system will be included in a future application filing for possible submission in 2015 or later.

As described in the response to BCUC IR No. 2 Q73.1, the incremental cost of implementing pre-pay after the installation of $A M I$ is expected to be much lower than the incremental cost of installing a stand-alone pre-pay system. However, FortisBC is not in a position to provide a reliable estimate at this time.
73.3 Please list (and quantify where possible) the benefits to the utility and customers from pre-pay meters (including any non-financial benefits).

## Response:

Please see Exhibit B-1, Table 6.5a for the financial benefits related to pre-pay for residential customers.

FortisBC provided a list of additional benefits in Exhibit B-1 Section 6.4 and in the response to BCUC IR No. 1.Q103.1, repeated below for convenience.

- Customers have the convenience and control of paying as much as they want, whenever they want;
- Experience from utilities offering pre-pay programs shows that participating customers tend to be highly satisfied with their utilities (http://www.elp.com/index/display/article-display/4104517685/articles/utility-automation-engineering-td/volume-16/issue-10/departments/perspectives/pre-paid-metering-amis-killer-app.html);

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- Pre-pay programs help consumers reduce their bills by raising awareness of energy consumption;
- Customers would not need a credit check or deposit; and
- The risk of write-offs from pre-pay customers is reduced.

Please also see the response to BCUC IR No. 1 Q73.2.
73.4 How would FortisBC expect to recover the pre-pay meter costs (for example, would customers be charged a separate fee)?

## Response:

If the cost of implementing pre-pay required only a regulatory application and system configuration, then FortisBC would propose to include the costs in revenue requirements to be paid for by all customers (consistent with the implementation of other new rate structures).

However, as discussed in the response to Tatangelo IR No. 1 Q52, the effective implementation of pre-pay tariff may require an IHD, which in turn may necessitate a pre-pay fee. FortisBC has not determined whether such a fee would create a significant barrier to pre-pay use, and if so, how such a barrier might be mitigated.
73.5 Please estimate customer uptake of pre-pay meters over the AMI period (assuming AMI was approved). Please provide assumptions used.

## Response:

Please refer to Exhibit B-1, Table 6.5a, Exhibit B-1, Appendix C-1, Table ES-2 and the responses to BCUC IR No. 1 Q8.2, Q104.1 and Q110.3.
73.5.1 Please estimate the BC NPV of net benefit for pre-pay meters under the AMI scenario (i.e., net benefits less net costs). Please state all assumptions made.

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## Response:

Please see the response to BCUC IR No. 1 Q110.3.
73.5.2 Please estimate the total cost savings to the utility if pre-pay meters were installed under the AMI scenario compared to the status quo. Please state all assumptions made.

## Response:

FortisBC does not have a cost estimate for a stand-alone (Status Quo) implementation of prepay metering, so cannot answer this question. Please also refer to the response to BCUC IR No. 2 Q73.1.

### 74.0 Reference: How much electricity is used <br> CPCN Guidelines, Appendix A, p. 6 <br> Class 4 degree of accuracy

Appendix A of the BCUC 2010 CPCN Guidelines ${ }^{28}$ states on page 6: "Cost estimates used in the economic comparison should have, at a minimum, a Class 4 degree of accuracy as defined in the Advancement of Cost Engineering ("EECA International") Recommend Practice No. 10S-90."
74.1 Does FortisBC consider that any financial benefits estimated for (i) TOU/CPP rates; (ii) online customer information portal/IHD; and (iii) pre-pay meters within this Application are included within the general description of a 'cost estimate used in the economic comparison' of the BCUC CPCN guidelines? If no, please explain why not.

## Response:

FortisBC has not claimed customer benefits for any of the items listed in the question and has assigned no reliance upon any of them within the financial modeling accompanying the

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application. Therefore they are not considered to be applicable, as far as the BCUC CPCN guidelines apply, for this Application.

They have been noted in the Application, and discussed in subsequent IRs, solely in the context of future benefits. The Company intends to include IHDs, supported by the relevant business case, within future PowerSense regulatory filings. Conservation rates and "pre-pay" will also be the subject of separate regulatory review if the Company elects to pursue them.
74.1.1 Does FortisBC consider it has met the Class 4 threshold for each item listed above? If yes, please explain. If no, please comment, for each item listed above, on the extent to which the Commission should discount or disregard projected future benefits when this threshold has not been met.

## Response:

Please see the response for BCUC IR No.2 Q74.1. Given that the subject items form no part of the customer benefits claimed in the Company's CPCN Application, it has not performed an AACE Class analysis.

### 75.0 Reference: Grow Op Thefts

## Exhibit B-6, BCUC IR 1.75.1

Exhibit B-1, Table 5.3.2.a; Table BCUC IR 1.76.1.1

## Exhibit A2-1

75.1 FortisBC stated "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,..."
75.1.1 Exhibit A2-1 states that the proportion of growers stealing power appears to be approximately $52 \%$ and as the number has been confirmed by BC Hydro, then why does FortisBC believe that only $25 \%$ of known or suspected marijuana sites are diverting energy.

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## Response:

FortisBC internal data does not support the 52 percent theft ratio. This ratio is considered as possibility in the additional High Range estimate of $\$ 93$ million presented in Table 5.3.2.d of the Application however a more conservative approach was modelled based on Company experience. Please see the responses to CEC IR No. 1 Q80.1, Q80.2, Q80.3 and Q80.4 as well as BCUC IR No. 1 Q85.3.1.
75.1.2 Provide evidence to support the statement that 25 percent of known or suspected marijuana sites are diverting energy.

## Response:

Please see the response to CEC IR No. 1 Q80.2.
75.2 Confirm that Exhibit A2-1 estimates 13,206 active growing operations in the province of BC.

## Response:

FortisBC confirms that page 3 of Dr. Plecas' report cites an estimated 13,206 active indoor marijuana production sites in the province of BC for the year 2010.
75.2.1 Confirm that Exhibit A2-1 estimates only 6,867 operations stole electricity across the province.

## Response:

FortisBC confirms that page 3 of Dr. Plecas' report cites an estimate that 6,867 indoor marijuana production sites stole electricity in 2010.

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75.3 Confirm that the number of grow sites used in Exhibit A2-1 is 13,740.

## Response:

The figure of 13,740 indoor marijuana production sites is a 2012 number calculated by FortisBC to reflect annual customer growth rates of $2 \%$ per year on 2010 figure of 13,206 calculated by Dr. Plecas. This number does not appear in Exhibit A2-1.
75.3.1 Provide the reference or calculation used to obtain the number 13,740.

## Response:

The calculation is $13,206 * 1.02 * 1.02=13,740$ which reflects estimated customer growth rates for both 2011 and 2012.
75.4 Of the 683 accounts, consuming more than $93 \mathrm{kWh} /$ day every billing period since September 2010, how many of these accounts have 200A service?

## Response:

FortisBC does not have complete service size data for the 683 accounts consuming more than 93 KWhs daily. However, 122 of 226 accounts for which service size data is available are sized at 200A. FortisBC does not have data on the service size of the remaining 457 accounts.
75.5 Confirm that the 683 accounts, consuming more than greater than $93 \mathrm{kWh} /$ day every billing period since September 2010, are paying customers.

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## Response:

FortisBC confirms that the 683 accounts are paying for greater than $93 \mathrm{kWh} /$ day.
75.5.1 In Exhibit B-1, p. 83, FortisBC states "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." Please reconfirm the number of 206 grow sites using Exhibit A2-1 and assuming those with 10 or less lamps are paying customers and provide the calculation.

## Response:

The 206 theft sites in 2012 cannot be confirmed using Exhibit A2-1. If Dr. Plecas' theft estimate of 52 percent is used instead of the Company estimate of 25 percent, the number of theft sites increases to 428. ( $0.52 * 824=428$ ) The FortisBC calculation is $(0.25 * 824=206)$ is based on Company internal data.

The BC Hydro estimate of 10 lights for paying sites as cited by Dr. Plecas is not supported by FortisBC data, and has no impact on the calculation for the number of theft sites. Please see the responses to CEC IR No. 1 Q81.1 and BCUC IR No. 2 Q28.1.1.
75.5.2 For what year does the number, 206, apply?

## Response:

The 206 calculated theft sites are for 2012. Please refer to page 83 line 6 of the Application (Exhibit B-1).
75.6 FortisBC states that for the years 2013, 2014 and 2015, the number of theft sites is 218,231 , and 244 respectively.

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75.6.1 Please explain how these numbers related to the number 824 in Exhibit B-1, Table 5.3.2.a.

## Response:

The 206 estimate of theft sites for 2012 is 25 percent of the 824 total sites for that year since the remaining 75 percent are deterred from theft. For the period 2013-2015 the number is projected to increase by 75 percent of the annual growth in total sites. The calculations are detailed for each year in the table which follows.

Table BCUC IR2 Q75.6.1

| Year | Total Sites | Increase in Total Sites | Increase in Theft Sites | Theft Sites |
| :---: | :---: | :---: | :---: | :---: |
| 2012 | 824 |  |  | 824*75\% = 206 |
| 2013 | 841 | 841-824=17 | $17 * 75 \%=12^{*}$ | $206+12=218$ |
| 2014 | 858 | 858-841=17 | $17 * 75 \%=13$ | $218+13=231$ |
| 2015 | 875 | 875-858=17 | $17 * 75 \%=13$ | $231+13=244$ |

### 76.0 Reference: AMI Project Progress Reports

## Exhibit B-6, BCUC IR 1.56.2

"FortisBC proposes to report on the above items annually to the BCUC for a period of five years once the AMI project is complete" or year 2020.
76.1 Please explain why FortisBC is not proposing to report on the benefits annually to BCUC for a period ending in 2032.

## Response:

FortisBC assumes the 76.0 reference intends to refer to the response to BCUC IR No. 1 Q56.3.
FortisBC believes a five year period after project completion for reporting on the Project benefits is reasonable and should be sufficient for the purposes of assessing the realization of benefits as compared to the level forecast in the Application. The Company respectfully submits that the

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costs would outweigh the benefits of continuing to report on the project benefits beyond that period.
76.2 Would FortisBC agree to issue quarterly project progress reports for the deployment period of the AMI project that addresses both costs and benefits?

## Response:

FortisBC would agree to issue quarterly project progress reports for the deployment period of the AMI Project that address both costs and benefits..
76.3 Would FortisBC agree to issue annual project progress reports for the postdeployment period to year 2032 of the AMI project that addresses both costs and benefits?

## Response:

FortisBC would agree to issue annual project progress reports for the post-deployment period to year 2032, however the Company notes that such a condition has not been a requirement for any prior approved capital project. As such, the Company questions the utility, necessity and costs associated with such a reporting requirement for the AMI Project.
76.4 Explain the benchmarking that FortisBC proposes to use to report benefits to BCUC.

## Response:

FortisBC has proposed target "benchmarks" for each of the benefits in its responses to BCUC IR No. 2 Q82.1 and Q91.7. FortisBC is not proposing any other benchmarks.

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76.4.1 Provide the benchmarking information for each benefit in the Application to be used for cost recovery and reporting, and assessing the performance of the AMI project.

## Response:

The benefit benchmarks referenced in the response to BCUC IR No. 2 Q76.4 are derived from the current state (Status Quo), and are intended to provide stakeholders with an objective measure of improvement related to the implementation of AMI.
76.4.2 If no benchmarking information is available, would FortisBC consider the final adjusted benefits from the cost/benefits analysis in the Application to be used as an appropriate baseline for cost recovery, reporting, and assessing the performance of the AMI project.

## Response:

Please see the response to BCUC IR No. 2 Q76.4.

### 77.0 Reference: AMI Cost and Benefits

Exhibit B-6, BCUC IR 1.56.14
FortisBC Controlled
77.1 Please identify the expenditures and benefits that are under the control of FortisBC, and their risk and uncertainty in being able to be achieved.

## Response:

All of the expenditures and benefits of the AMI project are under the control of FortisBC to a greater or lesser degree. Unpredictable external factors can always occur, which is why project contingencies are typically budgeted with respect to expenditures. There are no analogous "contingencies" provided for the financial benefits of the AMI project, which is why FortisBC has been conservative with respect to benefits.

The risk and uncertainty associated with achieving the expenditures and benefits are captured by the AACE Class Codes attributed to each category of expenditure and benefit as shown in the revised response to BCUC IR No. 1 Q53.3 and the response to BCUC IR No. 1 Q53.4.

### 78.0 Reference: AMI Cost Recovery

## Exhibit B-6, BCUC IR 1.53.14.2

MIT Study on the Future of the Electric Grid, Chapter 8, pp. 180-181 ${ }^{29}$
"...investments in new distribution technologies, such as those necessary to efficiently and reliably integrate distributed generation or effectively use the wealth of information provided by advanced metering infrastructure (AMI), may be subject to uncertainty about not only the level of costs and benefits but also about their timing and achievability. To be most effective, these investments may require coordination across different utility business units and the integration of legacy data communications and information management systems. Utilities may have limited experience with these technologies and have to work closely with equipment vendors that may have little experience with electric power distribution systems.

Complicating calculations further, many new technologies have benefit streams that potentially will extend many years after costs have been incurred and are partially a function of future technology innovation and deployment decisions. As a result, modernization investments may not be easily justified by predictable short-term improvements in reliability or incremental improvements in operations or operating costs. Extrapolation or meta-analyses of pilot results may help to narrow the range of likely outcomes, but considerable uncertainty for system deployments may remain."
78.1 Provide and explain the level of the uncertainty and risk in delivering each benefit stream identified in the Application over the deployment and post-deployment period.

## Response:

There are minimal financial benefits achieved during the deployment of the project, so the risk of delivering them is proportionally small. The uncertainty and risk associated with achieving postdeployment benefit stream is captured by the AACE Class Codes as shown in the revised response to BCUC IR No. 1 Q53.3 (Exhibit B-6-5).

[^17]
### 79.0 Reference: AMI Cost Recovery

## Exhibit B-6, BCUC IR 1.53.14.2

## Recovery of Smart Grid Costs

EnerNex served as the Facilitator of the Illinois Statewide Smart Grid Collaborative (ISSGC) and prepared the Collaborative Report dated September 2010 for submission to the Illinois Commerce Commission.
79.1 Does FortisBC consider smart grid investments to be different from other more traditional utility investments in ways that require special non-traditional cost recovery treatment?

## Response:

FortisBC does not consider smart grid investments to be different from other "more traditional" utility investments. Please also refer to the response to BCUC IR No. 2 Q81.1. As the development of utility equipment has progressed, the application of digital technology has become effectively universal in all areas of utility operations. This ranges from equipment used to monitor and control generating units, through the operation of the transmission and distribution system and ultimately all the way to the customer revenue metering device. Advances in telecommunications technology now permit a level of control and monitoring of the power system which was either infeasible or not cost-effective until relatively recently.

FortisBC considers all projects it proposes to the Commission for approval to be prudent and in the public interest. Further, these projects are required to support FortisBC's obligation to provide safe and reliable service to customers at the lowest reasonable cost. On that basis, the Company considers the existing treatment of including the associated capital expenditures in rate base with the associated costs recovered through a combination of debt and equity financing to be appropriate.
79.2 Do the AMI project investments have characteristics that differentiate them from traditional ${ }^{30}$ utility investments (i.e. substations) that are made to expand,

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maintain and upgrade the electricity delivery system in ways that pose new regulatory challenges, such as:

- higher level of uncertainty as to how they will function over time and affect costs,
- benefits may be difficult to predict, quantify, measure, and monetize,
- benefits that may justify such investments may be difficult to predict, quantify, measure and monetize, and may develop over an extended period of time,
- some potential smart grid benefits may not be directly experienced by some customer groups or individuals, and
- may not be needed to provide safe, adequate, and reliable service?


## Response:

Taken in the context that it was written, FortisBC agrees that some of the characteristics listed above may apply to utility Smart Grid investments, particularly areas where the technology is still evolving or otherwise not well-defined. FortisBC does not agree that this is the case with the AMI CPCN application. The "functionality" of the Project is primarily based on existing technology which has been well proven in numerous other utility deployments, and therefore is not subject to a "higher level of uncertainty".

There is some uncertainty with respect to the realization of benefits. This is why the Company has consistently used a conservative approach to calculating benefits. Some of the potential NPV improvements that would result from less conservative assumptions regarding the project are detailed in the response to CEC IR No. 1 Q61.1. This consistently conservative approach increases the likelihood that the benefits claimed in the Application will be achieved or exceeded.

More advanced aspects of the Smart Grid (such as Demand Response, Distribution Automation and Conservation Voltage Reduction) are not included in the AMI Project application and will be the subject of future consideration and possible submission for regulatory review to determine whether those enhancements are in the public interest.

Measuring and billing for customer consumption is a necessary component of the provision of service to customers. The Project as proposed meets this requirement while providing other customer and utility benefits such as improved revenue protection, improved system information and enhanced customer service. All of this is accomplished at a lower cost over the long-term as compared to the status quo manual meter reading process. As such, FortisBC considers the AMI project to be necessary in that it supports FortisBC's obligation to provide safe and reliable

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service to customers at the lowest reasonable cost. Respectfully, FortisBC submits that the Project as proposed is needed and is in the public interest.

Please also refer to the response to BCUC IR No. 2 Q81.1.

### 80.0 Reference: Cost Recovery of AMI Cost and Benefits

## Exhibit B-6, BCUC IR 1.40.3

## Recovery Options

80.1 As BC Hydro's business plan provides for rate smoothing and also claims significant benefits, please provide a more expansive explanation as to why the rate smoothing option was rejected.

## Response:

The Company did not present a rate smoothing option similar to BC Hydro's business plan. Both FortisBC and BC Hydro forecast an initial rate impacts of less than 2.0 percent, however BC Hydro does not forecast a net zero cumulative rate impact until 2024 whereas FortisBC expects a net cumulative rate decrease by 2016. Therefore, FortisBC did not feel that the rate impact was large enough to warrant a rate smoothing mechanism.
80.2 Does FortisBC consider that non-traditional cost recovery methods other than rate base recovery to be applicable to the AMI Application?

## Response:

Please refer to the response to BCUC IR No. 1 Q120.1.
80.2.1 As the project is primarily delivering benefits to the ratepayers for a cost, could it be considered for non-traditional cost recovery as it is not a substation or transmission line that has a stated capacity and which could be easily considered as traditional for cost recovery purposes?

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## Response:

The Company does not consider this project to be any different than any other project the Company might undertake whether the driver is capacity constraints, reliability improvements or efficiency gains resulting from the introduction of new software or technology that would reduce overall costs to the customer.

### 81.0 Reference: Other Proposed Rate Recovery Options

## Exhibit B-6, BCUC IR 1.20.1

## Non-Traditional Cost Recovery for AMI/Smart Grid Investments

In summarizing FortisBC's responses to BCUC IR 1.120.1, FortisBC stated:

1. Reconcilable tariff riders - such riders have not been employed by utilities operating in BC to effect rate recovery of specific capital expenditures.
2. As noted for the option above, such a mechanism has not been employed by utilities in BC for recovery of capital project expenditures.
3. Base-rate recovery opportunities - This is the existing rate-recovery mechanism applied to all of FortisBC's capital projects, and is the proposed mechanism for recovering the costs associated with the AMI Project.
4. Reconcilable balancing account mechanisms - This approach involves tracking the project costs and forecast benefits in a separate account to be periodically trued-up for recovery in rates. Like tariff riders and customer surcharge mechanisms, this type of mechanism for recovery of capital expenditures has not been employed by utilities operating in BC.
5. Rate-basing of some capital investment - same as 3.
6. Linking rate proceedings to smart grid projects that have stimulus funding applies to USA only.
81.1 As the AMI/Smart Grid Investments in other jurisdictions are starting to consider these type of projects to be non-traditional and the cost recovery should be treated differently than substations and transmission lines as the deliver benefits over a longer period, please explain why the Commission should use a base-rate recovery methodology instead of a reconcilable balancing account methodology have performance base conditions for the total cost and benefit duration of the AMI project (2013-2032).

1

## Response:

FortisBC believes that the cost recovery of the AMI project should be treated consistently with its Commission approved rate base recovery method. The Company does not agree that the AMI project is materially different than other capital projects, including other smart grid investments, substations and transmission lines.

Information Technology projects often result in benefits from reduced costs and enhanced customer service. They also require sustained investment over time in order to preserve their functionality. These projects too are appropriately recovered using the approved rate-base recovery method.

Electricity infrastructure investments generally deliver benefits over a "longer period". According to the Company's most recent Depreciation Study, substations and transmission lines have average useful lives of 50 years and the average composite depreciation rate implies an average 30 year life on all assets.

Perhaps most relevant, as stated in the responses to BCUC IR No. 1 Q12.1, Q12.2 and Q12.3, the Company has already received approval for and implemented a number of Smart Grid projects, and those costs have all been appropriately recovered using the approved rate-base recovery method. The Company believes that Smart-Grid assets represent an extension of the traditional assets used to provide services and benefits to customers, and that traditional ratemaking (including depreciation and earned return) is appropriate to recover these costs.

In addition, tracking the cost and benefit of the AMI project in a reconcilable balancing account would be problematic since many of the benefits cannot be directly measured in financial terms (please see the FortisBC benefits realization proposal in the response to BCUC IR No. 1 Q56.3).

### 81.1.1 Also in point 4 above, FortisBC stated:

"As noted in the response to BCUC IR1 Q53.14.2, the benefits of the Project would be incorporated into Revenue Requirements either as cost reductions or incremental revenue as they are forecast to be realized."
81.1.1.1 As the justification of the AMI project is a positive NPV resulting of a positive cost/benefit analysis, with the costs being mostly expended in the first two years and benefits delivered over the duration (2013-2032), what assurances does FortisBC provide for the benefit amounts to be realized in a timely manner to confirm justification of the NPV?

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## Response:

Alternate cost-recovery mechanisms will not help with realizing benefit amounts in a timely manner. As is typical with utility projects, the AMI project exhibits up-front costs with the benefits realized over a longer period of time. The Commission must weigh the evidence in order to determine whether the level of benefits claimed are reasonable and whether the time frame over which those benefits are claimed is reasonable. FortisBC believes it has taken an appropriately conservative approach to assessing the probable benefit of the AMI Project, helping ensure that the benefits are achieved or exceeded.

### 82.0 Reference: Tracking of AMI Cost and Benefits

Exhibit B-6, BCUC IR 1.40.3, 1.56.3; Exhibit B-1, Section 5.3 Benefits
82.1 Please provide a similar table in the response to BCUC IR 1.40 .3 for the monitoring and tracking of the benefits through to the end of the post-deployment period.

## Response:

Please see the following table:

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Table BCUC IR2 Q82.1 - Proposed Benefit Tracking Table


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### 83.0 Reference: Electrical Safety during AMI Installation <br> Exhibit B-6, BCUC IRs 1.27.1.2, 1.36.1.1, 1.36.2, 1.47.1, 1.47.2 <br> Meter Bases, Point of Delivery, Jurisdiction, Meter Deployment Training Manual, Itron

83.1 Provide a description of an A-Base meter adaptor.

## Response:

An A-Base adaptor is a device that is installed to allow an A-Base style meter base to accept a modern 4 jaw self-contained meter.
83.1.1 As the meter base is required to be CSA approved (see FortisBC British Columbia Service and Metering Guide, Version 4, Revision Date: July 2009, Section 1.13-CSA Approved Device / Meter Socket Requirements), is the Itron meter also CSA approved? If not, please explain why not.

## Response:

Please see the response for BCUC IR No.2 Q83.2. The Itron meter meets the equivalent Measurement Canada standard.
83.1.1.1 Do the meter sockets/bases have to conform to C22.2 NO. 115M1989 (R2010) - Meter-Mounting Devices and, if so, do any of the older meter bases have to be changed out to the newer CSA standard?

## Response:

FortisBC does not require customers to upgrade their electrical equipment to the latest standard(s) when performing meter exchanges.

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Customers requesting new or upgraded electrical service are required to obtain an electrical permit from the BC Safety Authority. This permit application and subsequent electrical inspection ensures the customer's electrical equipment meets the latest code requirements, including C22.2 NO. 115-M1989 (R2010) as applicable.

Fortis $B C$ staff do conduct a visual check of the customer's meter base as described in the response to BCUC IR1 Q47.1 during the meter exchange/installation process. Any anomalies or concerns the staff may have will be reported to FortisBC, immediately corrected if possible and left in a safe condition regardless.
83.1.2 If a non-CSA device is inserted into a CSA device is the resulting assembly still considered CSA approved?

## Response:

Yes. Please also note the assembly will continue to be combination of CSA and Measurement Canada-approved devices in both the status quo and AMI scenarios.
83.2 Does CSA CAN3-C17-M84 (R2008) apply to the Itron meter? If not, please explain why not.

## Response:

Electric meters, including digital, electro-mechanical, AMI wired, or AMI wireless meters (including Itron's wireless AMI meters) are required to meet the Measurement Canada specification LMB-EG-07 as they are used for billing. CSA CAN3-C17-M84 (R2008) is equivalent to Measurement Canada specification LMB-EG-07.
83.3 Provide a list of CEA standards that apply to FortisBC's AMI Application and identify those CEA standards, which FortisBC's AMI Application does not comply.

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## Response:

The CEA (Canadian Electricity Association) in general is more of a policy-setting body as opposed to a standards-making entity.

Notwithstanding this, the CEA has produced a document entitled "CEA Guideline for the Selection and Use of Smart Grid Standards". As suggested by the title, this document is more of a guide to selecting standards produced by other standards bodies as opposed to a definitional standard.

This document lists high-level, elective principles that a utility should use in selecting other standards. Those principles include:

1. Applicability
2. Interoperability
3. Openness
4. Maturity/Stability
5. Implementation
6. Compatibility/Interchangeability
7. Compliance
8. Availability

FortisBC submits that the proposed AMI system, and the associated applicable standards which have been described in numerous previous responses, are consistent with most, if not all, of these high-level principles.
83.4 Provide a list of standards, which the Itron meter complies to, and identify any Canadian standards that are applicable.

## Response:

The following table shows the standards with which Itron has stated the meter complies. The table also shows whether the standard is a Canadian standard.

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Table BCUC IR2 Q83.4 - Applicable Meter Standards

| Standard | Complies with <br> Standard? | Canadian Standard? |
| :--- | :---: | :---: |
| ANSI C12.1-2008 - Code for <br> Electricity Metering; | Yes | No |
| ANSI C12.10-2004 - Physical Aspects <br> of Watthour Meters - Safety Standard; | Yes | No |
| ANSI C12.18-2006 - Protocol <br> Specification for ANSI Type 2 Optical <br> Port; | Yes | No |
| ANSI C12.19-1997 - Utility Industry <br> End Device Data Tables; | Yes | No |
| ANSI C12.20-2002 - For Electricity <br> Meter - 0.2 and 0.5 Accuracy <br> Classes; | Yes | No |
| ANSI C12.22-2008 - Electric Meter <br> Interface to a Network Protocol <br> Gateway; | Yes | No |
| IEEE C62.41.1-2002 - Guide on the <br> Surge Environment in Low-Voltage <br> (1000V and Less) AC Power Circuits; | Yes | No |
| IEEE C62.41.2-2002 - Recommended <br> Practice on Characterization of <br> Surges in Low-Voltage (1000V and <br> Less) AC Power Circuits; | Yes | No |
| IEEE C62.45 - 1992 - Guide on <br> Surge Testing for Equipment <br> Connected to Low-Voltage AC Power <br> Circuits | Yes | No |
| IEC 61000-4-2 Electromagnetic <br> compatibility (EMC) - Part 4-2: <br> Testing and measurement techniques <br> - | Electrostatic discharge immunity |  |
| test; |  |  |$\quad$|  |  |
| :--- | :--- |
| IEC 61000-4-4 Electromagnetic <br> compatibility (EMC) - Part 4-4: | Nes |

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| Standard | Complies with <br> Standard? | Canadian Standard? |
| :--- | :--- | :--- |
| Testing and measurement techniques <br> - Electrical fast transient/burst <br> immunity test; |  |  |
| Measurement Canada LMB-EG-07 - <br> Specifications for Approval of Type of <br> Electricity Meters, Instrument <br> Transformers and Auxiliary Devices; | Yes |  |
| Measurement Canada S-E-06 - <br> Specification for the approval of type <br> of Electricity Meters and Auxiliary <br> Devices - Amendment to LMB-EG- <br> 07; | Yes | Yes |
| NEMA SG-AMI 1 - Requirements for <br> Smart Meter Upgradeability. | Yes |  |
| IEEE 1588 - A Precision Clock <br> Synchronization Protocol for <br> Networked Measurement and Control <br> Systems | Yes | Yes |
| IEEE 1613 - IEEE Standard <br> Environmental and Testing <br> Requirements for Communications <br> Networking Devices in Electric Power <br> Substations | Ye | No |
| IEC 61850-3 - Protocol for <br> Communications Network in <br> Substations | Yes | No |
| Limits of Human Exposure to <br> Radiofrequency Electromagnetic <br> Fields in the Frequency Range from 3 <br> kHz to 300 GHz - Safety Code 6 <br> (Health Canada) | Yes | Yes |
| CSA C22.1 - 2012 Canadian <br> Electrical Code, Part 1 |  | Yes |
| CSA Z462-12 - Canadian Electrical <br> Code, Workplace Electrical Safety <br> Standard |  | Yes |


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| Standard | Complies with <br> Standard? | Canadian Standard? |
| :--- | :---: | :---: |
| NFPA 70E - National Fire Protection <br> Association Standard for Electrical <br> Safety in the Workplace | Yes | No |


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## Response:

The OpenWay CENTRON and OpenWay CENTRON Polyphase meters are Measurement Canada approved under Notice of Approval AE-1641 and AE-1822 respectively.
83.7 Provide the Point of Delivery for the common overhead service at less than 300VAC to Residential Customers.

## Response:

The Point of Delivery for the common overhead service is the connection point where the utility overhead supply conductors attach to the conductors entering the service mast.
83.8 Who in FortisBC will approve the meter deployment training manual once it is created?

## Response:

The AMI Project Manager, in consultation with qualified personnel from within the Company, will approve the meter deployment training manual. Please also refer to the response to CEC IR No. 1 Q52.1
83.8.1 Will a FortisBC Professional Engineer approve and seal the meter deployment training manual once it is created?

## Response:

FortisBC does not expect to have a Professional Engineer approve and seal the deployment training manual. The meter deployment manual is a document that will establish how the meters will be exchanged safely in the field. Procedural documents such as this do not require a Professional Engineer's seal at FortisBC.

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The review and approval of this manual will be completed as described in CEC IR No. 1 Q52.1.

## Response:

FortisBC will review the deployment training manual toward the end of the Define/Design stage, which is expected to be the fourth quarter of 2013.
83.8.3 When will the approved meter deployment-training manual be available for review?

## Response:

The meter deployment training manual will be approved within one month after a final draft is completed.
83.9 Does Itron retain liability for any property damage caused by AMI meter deployment, or do the Terms and Conditions of FortisBC's Electric Tariff also protect it from liability?

## Response:

Yes, FortisBC expects that Itron will retain liability for any property damage caused by its subcontractor for AMI meter deployment

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83.10 As the AMI will generally be located downstream of the Point of Delivery and the meter base is the property of the homeowner, explain why FortisBC considers it is exempt from the Safety Standards Act administered by the BCSA?

## Response:

Please note that this response applies to both the revenue metering currently installed at customer premises and the proposed AMI metering.

It is necessary to distinguish between the customer's service entrance equipment and the revenue metering device. A customer's service entrance installation consists of: the service mast and supply conductors (in the case of an overhead service), the meter base itself and the load-side conductors connecting to the customer's equipment. All of this equipment is installed by the customer and by law must meet the requirements of the BC Electric Safety Regulations and hence the Canadian Electrical Code.

FortisBC's only involvement with respect to the service entrance installation described above is to plug its revenue meter device into the customer-installed equipment (the meter base). Consequently, FortisBC only retains ownership and responsibility for the revenue meter itself. As the consumption information provided by the revenue meter is necessary for FortisBC to carry out its distribution function as an electric utility. This function (and hence the revenue meter itself) falls within the utility exclusion clause defined in Section 3 (1) of the Safety Standards Act - irrespective of the Point of Delivery demarcation.

## From the Safety Standards Act:

## Application to utilities

3 (1) This regulation, except for section 3.1, does not apply to a public utility as defined in the Utilities Commission Act in the exercise of its function as a utility with respect to the generation, transmission and distribution of electrical energy.
(2) Despite subsection (1), this regulation applies to the electrical equipment owned or in the possession or control of a public utility if the electrical equipment is not used directly in the generation, transmission and distribution of electrical energy.
[am. B.C. Reg. 198/2006, s. (a).]

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83.10.1 If FortisBC considers itself exempt from the Safety Standards Act in this instance, then is FortisBC subject to the Utilities Commission Act, sections 23 through 26 for safety oversight and regulatory matters?

## Response:

FortisBC is subject to all sections of the Utilities Commission Act that apply to public utilities involved in the provision of electric service to customers.
83.10.2 Section 3.1 ("Point of Delivery") of the FortisBC Electric Tariff states: "Unless otherwise specifically agreed to, the Point of Delivery is the first point of connection of the Company's facilities to the Customer's conductors or equipment at a location designated by or satisfactory to the Company, without regard to the location of the Company's metering equipment."
83.10.2.1 In this case of the Tariff, who has jurisdiction for safety, the Commission or the BCSA?

## Response:

FortisBC is responsible for the utility infrastructure, including safety, to the point of delivery at the customer's electrical service, as subject to regulation by the Commission as provided by the UCA. The BCSA has jurisdiction over the customer's electrical system downstream of the FortisBC point of delivery as provided by the Safety Authority Act and the Safety Standards Act.
83.11 As FortisBC agrees there is a low risk of mechanical damage during the installation of an AMI meter, does FortisBC agree that the impact of the mechanical damage may result in significant consequences (such as a fire)?

## Response:

FortisBC does not agree that a meter base failure may result in significant consequences. All metering incidents are reported and investigated as part of the FortisBC safety management

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system. The investigations are geared to establish the root cause of the incident as well as the necessary actions to control or eliminate further incidents.

In the period from 2006-2011, FortisBC conducted 54,640 meter exchanges with 13 reported incidents. There were no incidents that were considered to be of significant consequences, including fire.

Please refer to CEC IR No. 1 questions 55.2, 55.3, 55.3.1, 55.3.2 \& 55.3.3
83.11.1 In the unlikely event of a fire, would FortisBC be accountable under the Terms and Conditions of FortisBC's Electric Tariff, or is the homeowner expected to cover the damage?

## Response:

FortisBC believes that AMI system will be compliant with the applicable legal framework. In the event of damage alleged to be caused by an AMI meter FortisBC and any relevant authorities will assess the cause of the damage and assess where the responsibilities lie with respect to costs for remedial actions.
83.11.2 Provide a copy of the Underwriters Laboratories (UL) Report ${ }^{31}$ prepared for the alleged PECO smart meter fires experienced in Pennsylvania.

## Response:

FortisBC was unable to obtain a copy of the Underwriters Laboratories Report prepared for the alleged PECO smart meter fires experienced in Pennsylvania. The report is proprietary and not available publicly.

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> 83.12 What is the likelihood of the AMI meter functioning after an extreme temporary overvoltage event occurring; and can the fuse be repaired by the manufacturer or FortisBC?

## Response:

The OpenWay CENTRON single phase meter can withstand up to two times line voltage. Autoranging polyphase meters withstand up to 576 V . Conditions which exceed this design threshold are neither predictable nor characterized during the design process.

The product is designed to withstand two times line voltage indefinitely (i.e. 480 V rms for the FM2S) which enables the product to sustain overvoltage conditions. The single phase meter forms utilize a current limiting resistor prior to the surge arrestor. The current limiting resistor enables the product to minimize the energy dissipated during extreme overvoltage events, when these events are in excess of twice line voltage. For single phase forms, this protection scheme is superior to the more commonly used designs where the surge arrestor is directly across the line.

The basic block diagram is shown below. The R1 resistor was a joint development with a resistor manufacture to limit the current and reduce the likelihood of catastrophic failure by fusing open in the event of high current draw.


The polyphase meter is designed to withstand up to 576 V RMS. This design has three surge arrestors (MOV directly across between line and neutral). Except in instances of ferroresonances, present in a specific service type (3 phase, 4 wires delta), 576 V rms rating is sufficient to enable polyphase products to ride through these system "events." This protection scheme has been used in all Itron polyphase meters since 2000 (approximately 2 million polyphase meters).

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As with the digital meters currently deployed, an overvoltage condition that exceeds the capabilities of the design identified above may cause the meter to fail. The probability of failure depends on the severity of the overvoltage condition.
83.12.1 Is there any other means of protecting the meter against the impact of an extreme temporary overvoltage event that have been known to occur within the Fortis $B C$ service area?

## Response:

Other devices (such as fuses or surge suppressors) can be installed external to the meter to aid in the protection against extreme overvoltage conditions.

### 84.0 Reference: Opt-Out

Exhibit B-6, BCUC IRs 1.117.1, 1.117.2
Quebec Opt-Out; FortisBC Opt-Out and Impact to NPV
84.1 Please provide a translated (English) version of the Decision made by Quebec.

## Response:

An English translated version of the Opt-Out Decision made by the Régie de l'énergie is provided as Appendix BCUC IR2 84.1.
84.2 Confirm that by the Clean Energy Act, does not address the opt-out provision for FortisBC customers at this time and only applies to BC Hydro.

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## Response:

Not confirmed. The Clean Energy Act applies to FortisBC in several sections, including 17(1) and 17 (6). FortisBC confirms that the Clean Energy Act does not address opt-out provisions for smart meters.

The provisions relating to smart metering in sections 17 (2), 17 (3), 17 (4) and 17 (5) of the CEA relate only to BC Hydro.
84.3 Confirm that under section 8.2 of the Terms and Conditions of FortisBC's Electric Tariff, FortisBC may, or will, suspend service to those customers refusing installation of an AMI meter.

## Response:

## Confirmed.

84.4 If an opt-out provision is allowed and the existing meters are permitted to be retained, at what level of opt-out does the NPV become negative.

## Response:

As is noted in the response for BCUC IR No. 2 50.2, "FortisBC cannot estimate a maximum number of opt-out customers that could be accommodated under the conditions noted...", including the requirement for opt-out customers to hold all other customers harmless in terms of lost benefits and increased costs. This requirement is satisfied by having opt-out customers pay a one-time set up fee and ongoing manual meter reading charge as set out in the response for CEC IR No. 1 Q50.6.

Therefore, in responding to this and the following questions (84.4, 84.4.1, 84.5, and 84.5.1), the Company is providing a sensitivity analysis with the following assumptions, depending upon which type of meter is installed:

Retain Existing Meters:

1. One-time and ongoing fees to cover manual meter reading are not being collected from the opting out customer.

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2. Theft reduction benefits are reduced by five times the opt-out rate (energy balancing would become substantially hindered by material opt-out rates)
3. Measurement Canada Compliance benefits are reduced by the opt-out rate,
4. Remote Disconnect/Reconnect and Contact Centre benefits are reduced by the out-out rate
5. Meter reading benefits are reduced.
6. Project Capital Cost is reduced by the fewer numbers of AMI meters being purchased
7. Project Capital Cost is increased by the $\$ 110$ per unit cost required to set up the Opt Out meter, this includes:
a. Additional system configuration costs
b. Additional network devices to preserve the RF mesh.

Radio-off AMI Meters:

1. One-time and ongoing fees to cover manual meter reading are not being collected from the opting out customer.
2. There is no material loss of theft reduction benefits,
3. There is no material loss of the avoided cost benefit for Measurement Canada Compliance,
4. Remote Disconnect/Reconnect and Contact Centre benefits are reduced by the percentage of customers opting out
5. Meter reading benefits are reduced.
6. Project Capital Cost is increased by the $\$ 110$ per unit cost required to set up the Opt Out meter, this includes:
a. Additional system configuration costs
b. Additional network devices to preserve the RF mesh.

The following table provides detail for the requested sensitivity analysis:

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This analysis demonstrates that an opt-out program using existing meters is considerably more expensive due to benefits erosion than an opt-out program that relies on "radio-off" AMI meters.
84.4.1 Assuming levels of opt-out of $1 \%, 5 \%$ and $10 \%$, provide an order of magnitude cost for retaining the existing meters while considering these opt-out levels.

## Response:

Please refer to the response for BCUC IR No. 2 Q84.4.
84.5 If an opt-out provision is allowed and the AMI meter transmit function are disabled, at what level of opt-out does the NPV become negative?

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## Response:

Please see the response for BCUC IR No. 2 Q84.4.
84.5.1 Assuming levels of opt-out of $1 \%, 5 \%$ and $10 \%$, provide an order of magnitude cost for reading the disabled AMI meters while considering these opt-out levels.

## Response:

Please see the response for BCUC IR No. 2 Q84.4.
84.6 Provide a discussion of the public interest in allowing the retention of existing meters and the disabled AMI meters while considering the reduction in the flow of benefits to the other customers having AMI meters.

## Response:

FortisBC believes that an opt-out provision (or, for that matter, a "wired" AMI alternative) is not required. The evidence does not validate the health and environmental concerns related to "wireless" AMI meters expressed by a small proportion of the population. Nor does the evidence support the security concerns expressed by an even smaller proportion of the population. Further, there can be significant monetary and opportunity costs if an opt-out provision is adopted, the magnitude of which varies depending on participated rates and the design of the provision.

If the Commission determines that an opt-out provision is in the public interest, FortisBC believes that the "opt-out" customers should pay for the incremental costs related to their choice, and that a radio-off AMI meter be used as the "opt-out" meter as further described in the response to BCUC IR No. 2 Q50.2.

FortisBC believes the public interest is best served by implementing the AMI Project in the manner proposed in the Application.

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### 85.0 Reference: Distribution of Costs and Benefits <br> Exhibit B-6, BCUC IR 1.118.1; Exhibit B-1, Tab 9.0, Section 9.4, pp. 147-148 <br> BCMEU Expectation <br> In the Application, FortisBC states "...There is an expectation from the BCMEU that there should be no cost impact to the wholesale customers of FortisBC (which are the members of the BCMEU receiving wholesale service from FortisBC); ..." <br> 85.1 Please explain the above statement in the Application while considering the response to BCUC IRs 1.118.1, 1.118.2, and 1.118.3.

## Response:

FortisBC does not know what to explain. The referenced IRs are written specifically in response to the statement cited from the Application. As stated in the response to BCUC IR No. 1 Q118.1, FortisBC does not know why the BCMEU expects that there should be no cost impacts to their members. The BCMEU should expect to share the costs and benefits of the AMI project in the same manner as other customers.

### 86.0 Reference: Accuracy of the Cost and Benefits <br> Exhibit B-6, BCUC IR 1.53.3, 1.53.4 <br> Benefits and Class 4 Estimate

86.1 Provide the accuracy of the benefits shown in the Application.

## Response:

Please see the revised response in Exhibit B-6-5, BCUC IR No.1 Q53.3.
86.1.1 Describe and rank the risk and uncertainty in achieving the stated benefits with the number 10 being the highest risk and/or uncertainty.

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## Response:

Please see the following table:
Table BCUC IR2 Q86.1.1 - Benefit Risk/Uncertainty Ranking

| Benefit | Ranking |
| :--- | :--- |
| Meter Reading | 3 |
| Remote Disconnect/Reconnect | 5 |
| Contact Centre | 4 |
| Meter Exchange | 2 |
| Theft Reduction | 10 |

"Risk and uncertainty" arguably has a negative interpretation. FortisBC has provided this ranking on request, but it should be interpreted with the understanding that the rankings simply reflect the potential variance of the benefit.

Although Theft Reduction has a maximum "risk and uncertainty" (as required by the question), it has also been estimated conservatively and the bulk of the "risk and uncertainty" is to the benefit of customers.
86.2 For the portion, $2.6 \%$, of the project that warranted a Class 4 estimate classification, please identify the items included, the scope, risk and consequences.

## Response:

Please see the table below:
Table BCUC IR2 Q86.2

| Class 4 AACE Estimates |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Project Components: | Cost of Component Totals | \% of <br> Total <br> Project <br> Cost | CPCN <br> Contingency \$ | CPCN <br> Contingency \% |
| Theft Reduction Devices | \$1,000,000 | 2.10\% | \$100,000 | 10.00\% |
| Customer Web Portal Desigrr'Build | \$250,000 | 0.52\% | \$25,000 | 10.00\% |

Both items are considered Class 4 estimates as they meet criteria noted on page 8 of the AACE International Recommended Practice No. 18R-97, dated February 2, 2005. Specifically:

- Their project scope description is preliminary
- Their project plan and master schedule are preliminary, and
- The contracting strategy is assumed.

To elaborate:

- Scope
o Theft reduction devices - acquire suitable feeder meter equipment to work in conjunction with deployed AMI communications network; commence initial deployment in 2015
o CIP - design/build secure-access customer information portal, integrated to AMI and existing FortisBC systems; utilize FortisBC IT/IS resources after AMI back office is built/tested/accepted; field test-ready by 3Q2015
- Risk
o Theft reduction devices - devices have not been sourced or contracted.
o CIP - uncertain as to whether "off-the-shelf" solutions are available and easily modified to suite, or whether CIP will have to be built completely in-house.
- Consequences
o Theft reduction devices - Costs could vary, although risk exposure is limited given the Company's planned "staged" implementation.
o CIP - limited risk. CIPs are a mature product and one with which the Company has some experience. The only real variable is related to the decision on whether to do this "in-house" or integrate an "off-the-shelf" product.

Given all of the above, the Company considers it prudent to classify these two items at Class 4, while maintaining their actual contingency at 10 percent.
86.3 Please explain why the Class 3 estimate portion has a contingency of $13.16 \%$ when the Class 4 estimate portion has a contingency of only $10 \%$.

## Response:

Please see the response to BCUC IR No. 2 Q86.2 for detail regarding the contingency associated with Class 4 estimate portion of the project.

The following table contains detail regarding the Class 3 estimate of the project:

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Table BCUC IR2 Q86.3

| Class 3 AACE Estimates |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Project Components: | Cost of Component Totals | \% of <br> Total <br> Project <br> Cost | CPCN <br> Contingency $\$$ | CPCN <br> Contingency \% |
| Meter Deployment | \$5,839,495 | 12.25\% | \$721,218 | 12.35\% |
| Acceptance Sampling | \$24,000 | 0.05\% | \$2,400 | 10.00\% |
| WAN | \$1,959,172 | 4.11\% | \$587,752 | 30.00\% |
| FBCIT DesigrlBuild | \$1,885,678 | 3.95\% | \$188,568 | 10.00\% |
| FBC Project Management | \$2,939,326 | 6.16\% | \$164,360 | 5.59\% |
| Totals: | \$12,647,671 | 26.52\% | \$1,664,298 | 13.16\% |

All individual items fall within the Class 3 range of +10 to +30 with the exception of Project Management. Project Management, representing approximately 6 percent of overall project costs, is considered a Class 3 estimate given that plans and staffing are considered to be in the "preliminary/complete" range, as suggested for Class 3. Project Management carries a contingency of approximately 6 percent, which, while below the indicated range for a Class 3 estimate, FortisBC considers adequate given the Company's well developed project management experience.

### 87.0 Reference: Accuracy of the Cost and Benefits

## Exhibit B-6, BCUC IR 1.53.4

Table BCUC 1.29.1
87.1 In Q1 2014, the table shows a significant slowdown in the progress of the project. Please explain the cause of the slowdown and are resources maintained or curtailed during this period.

## Response:

Q1 2014 represents the time between Define/Design and meter deployment. It is not a slowdown. Activities that will be occurring include:

- Building the back-office
o Acquiring and installing hardware
o Translating the Technical Architecture Document (TAD - finalized during the Define/Design phase) into work plans

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o Commence backoffice build

- Preparation for Network deployment
o Final WAN plan completed during Define/Design phase enables acquisition of WAN hardware and any applicable licensing.
o Commence site finalization and "make-ready" work for network devices
o Commence deployment of network devices
- Preparation for meter deployment
o Selection of meter deployment subcontractor
o Commence manufacture of FortisBC AMI meters
FortisBC internal resources and applicable contractor resources will be maintained and fully occupied.


### 88.0 Reference: Percentage Completion of Project <br> Exhibit B-6, BCUC IR 1.29.1 <br> Customers Classes

88.1 Provide the data to show the distribution of costs and benefits across the various direct customer classes forecast in the year 2013 by completing the tables below.

## Response:

The question is unclear, therefore in order to provide an answer, FortisBC has had to make some assumptions, as follows:
a) FortisBC has chosen to simply allocate costs and benefits to each of the customer classes based upon the percentage of customers represented by each class divided by the total customers (in 2013).
b) The Company has removed the columns marked "Capital Costs (Benefits, Costs/Benefits) per meter per kWh consumed (\%)" as it was unable to answer the question, "percentage of what?".
c) Total Project Capital Expenditures are taken to mean the NPV of Project Capital expenditures, including Meter Growth and Replacement and IT Hardware/Licensing and Support from 2013-2032.
d) Benefits are taken to mean the NPV of all benefits, including the theft reduction benefits, the avoided capital cost benefit associated with Measurement Canada Compliance, and
nets the NPV of New Operating Expenses against the NPV of other operating benefits such as meter reading, remote disconnect/reconnect, meter exchanges and contact centre.
e) AMI meters installed is taken to mean the total AMI meters installed as of the end of 2015 - the end of project implementation - and not to include AMI meters installed from 2016 - 2032 for customer growth.

The Company respectfully submits that allocating the costs and benefits of individual capital projects to individual customer classes on an arbitrary basis is not the best method of determining costs attributable to individual customer classes. Such a method has not been vetted through an appropriate COSA process and could therefore have high margins of error. Also, if such a method is used regularly for capital projects, it could dramatically increase the cost of regulating utilities. The most appropriate method of allocating costs and benefits to individual customer classes is through a fully allocated cost of service study which determines the basis for allocating all costs and revenues of the utility. In fact, the Company submits that attempting to perform allocations of costs and benefits for individual capital projects would likely lead to inter-class inequities and should be avoided. The Company has previously proposed, both in its last cost of service study and in its previous revenue requirement applications, that it's next cost of service study should be performed once the Company has one year of meter data from the AMI meters. The improved consumption data from AMI meters will assist in developing a more accurate fully allocated cost of service study than would otherwise be possible.

Finally, the Company submits that the benefits of the AMI project more than offset the costs and over time results in a benefit to customer rates, therefore not performing a fully allocated cost of service study at this time would not cause the AMI project to create inter-class inequities.
88.1.1 Complete the Regulatory Cost and Capital Expenditure Distribution table below:

| FortisBC <br> Direct <br> Customer <br> Classes | Forecasted <br> Direct <br> Customers <br> in 2013 | Regulatory <br> Costs (\$) | Capital Expenditure <br> (\$) | Capital <br> Expenditure <br> per AMI <br> meter <br> installed <br> (\$) | Capital <br> Expenditure <br> per AMI <br> meter <br> installed (\%) | Capital Costs per meter per kWh consumed (\$) | Capital Costs per meter per kWh consumed (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Residential |  |  |  |  |  |  |  |


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| Commercial |  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Wholesale |  |  |  |  |  |  |  |
| Industrial |  |  |  |  |  |  |  |
| Lighting |  |  |  |  |  |  |  |
| Irrigation |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Total |  |  |  |  |  |  |  |

## Response:

Please see the following table:
Table BCUC IR2 Q88.1.1 - Regulatory Cost and Capital Expenditure Distribution

| FortisBC Direct Customers | Forecasted Direct Customers in 2013 | Forecasted Direct Customers in 2013 (as \% of total) | Forecast Load (kWh) 2013 (000) | Project Regulatory <br> Cost Forecast (\$000) | Total NPV of Project Capital Expenditure (including Regulatory Cost Forecast) (\$000) | Total NPV of Project Capital Expenditure per AMI meter installed (\$000) | Total NPV of <br> Project Capital <br> Expenditure per AMI meter installed <br> (\%) | Total NPV of Project Capital Expenditures per meter per kWh consumed in 2013 (\$) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Residential | 103279 | 88.6\% | 1,306,466 | \$1,773 | \$42,629 | \$406.97 | 0.00085\% | \$0.32 |
| Commercial | 12130 | 10.4\% | 728,165 | \$208 | \$5,007 | \$406.97 | 0.00085\% | \$0.57 |
| Wholesale | 7 | 0.0\% | 956,044 | \$0 | \$3 | \$406.97 | 0.00085\% | \$0.43 |
| Industrial | 36 | 0.0\% | 261,072 | \$1 | \$15 | \$406.97 | 0.00085\% | \$1.58 |
| Irrigation\& Lighting | 1075 | 0.9\% | 59,993 | \$18 | \$444 | \$406.97 | 0.00085\% | \$6.88 |
| Total | 116527 | 100.0\% | 3,311,740 | \$2,000 | \$48,097 | \$406.97 | 100.0\% |  |

"Costs" are the NPV of Project Capital (Line 27 of the Net AMI - Exhibit B-1-1), and AFUDC (Line 33), Meter Growth and Replacement (Line 29), and IT Hardware/Licensing and Support (Line 32).

Please see the response to BCUC IR No. 2 Q88.1 for an explanation why FortisBC believes the above allocations are not appropriate and should be determined through a fully allocated cost of service study.

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| FortisBC <br> Direct <br> Customer <br> Classes | Forecasted <br> Direct <br> Customers in 2013 | Benefits (\$) | Benefits <br> per AMI meter installed (\$) | Benefits <br> per AMI <br> meter <br> installed (\%) | Benefits <br> per meter <br> per kWh consumed <br> (\$) | Benefits <br> per meter <br> per kWh <br> consumed <br> (\%) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Residential |  |  |  |  |  |  |
| Commercial |  |  |  |  |  |  |
| Wholesale |  |  |  |  |  |  |
| Industrial |  |  |  |  |  |  |
| Lighting |  |  |  |  |  |  |
| Irrigation |  |  |  |  |  |  |
| Total |  |  |  |  |  |  |

## Response:

88.1.2 Complete the AMI Benefit Distribution table below.

Please see the following table:
Table BCUC IR2 Q88.1.2

| FortisBC Direct Customers | Forecasted Direct Customers in 2013 | Forecasted Direct Customers in 2013 (as \% of total) | Forecast Load (kWh) 2013 (000) | NPV of Benefits (\$000) | NPV of Benefits per AMI meter installed (\$000) | NPV of Benefits per AMI meter installed (\%) | NPV of Benefits per meter per kWh consumed in 2013 (\$) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Residential | 103279 | 88.6\% | 1,306,466 | -\$58,121 | -\$554.88 | 0.00085\% | -\$0.43 |
| Commercial | 12130 | 10.4\% | 728,165 | -\$6,826 | -\$554.88 | 0.00085\% | -\$0.77 |
| Wholesale | 7 | 0.0\% | 956,044 | -\$4 | -\$554.88 | 0.00085\% | -\$0.59 |
| Industrial | 36 | 0.0\% | 261,072 | -\$20 | -\$554.88 | 0.00085\% | -\$2.16 |
| Irrigation\& Lighting | 1075 | 0.9\% | 59,993 | -\$605 | -\$554.88 | 0.00085\% | -\$9.38 |
| Total | 116527 | 100.0\% | 3,311,740 | -\$65,576 | -\$554.88 | 100.0\% |  |

"Benefits" are the NPV of New Operating Costs (Line 46 of Net AMI - Exhibit B-1-1), netted against the NPV of the avoided capital cost benefit of Measurement Canada Compliance (Line 31), Handheld Replacements (Line 30), Meter Reading (Line 47), Remote Disconnect/Reconnect (Line 48), Meter Exchanges (Line 49), Contact Centre (Line 50), and Theft Reduction (Line 52).

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| FortisBC |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Direct <br> Customer <br> Classes | Forecasted <br> Direct <br> Customers in <br> 2013 | Costs/Benefits <br> (\$) | Costs/Benefits <br> per AMI meter <br> installed <br> (\$) | Costs/Benefits <br> per AMI meter <br> installed (\%) | Costs/Benefits <br> per meter per <br> kWh consumed <br> (\$) | Costs/Benefits <br> per meter per <br> kWh consumed <br> $(\%)$ |
| Residential |  |  |  |  |  |  |
| Commercial |  |  |  |  |  |  |
| Wholesale |  |  |  |  |  |  |
| Industrial |  |  |  |  |  |  |
| Lighting |  |  |  |  |  |  |
| Irrigation |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Total |  |  |  |  |  |  |

## Response:

## Please see the following table:

Table BCUC IR2 Q88.2 - Net Cost/Benefit Distribution

| FortisBC Direct Customers | Forecasted Direct Customers in 2013 | Forecasted Direct Customers in 2013 (as \% of total) | Forecast Load (kWh) 2013 (000) | Total NPV Project Capital Expenditures - <br> NPV of Benefits (\$000) | Total NPV of Project Capital Expenditures NPV of Benefits per AMI meter installed (\$000) | Total NPV of Project Capital Expenditures - NPV of Benefits per AMI meter installed (\%) | Total NPV Project Capital Expenditure - NPV of Benefits per meter per kWh consumed in 2013 <br> (\$) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Residential | 103279 | 88.6\% | 1,306,466 | -\$22,015 | -\$210.18 | 0.00085\% | -\$0.16 |
| Commercial | 12130 | 10.4\% | 728,165 | -\$2,586 | -\$210.18 | 0.00085\% | -\$0.29 |
| Wholesale | 7 | 0.0\% | 956,044 | -\$1 | -\$210.18 | 0.00085\% | -\$0.22 |
| Industrial | 36 | 0.0\% | 261,072 | -\$8 | -\$210.18 | 0.00085\% | -\$0.82 |
| Irrigation\& Lighting | 1075 | 0.9\% | 59,993 | -\$229 | -\$210.18 | 0.00085\% | -\$3.55 |
| Total | 116527 | 100.0\% | 3,311,740 | -\$24,839 | -\$210.18 | 100.0\% |  |


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1 Please see the response to BCUC IR No. 2 Q88.1 for an explanation why FortisBC believes the 2 above allocations are not appropriate and should be determined through a fully allocated cost of 3 service study.

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5
88.3 Complete the table below for the 20 year program:

| Year | Costs per AMI meter installed (\$) | Benefits per AMI meter installed (\$) |
| :---: | :---: | :---: |
| 2013 |  |  |
| 2014 |  |  |
| 2015 |  |  |
| 2016 |  |  |
| 2017 |  |  |
| 2018 |  |  |
| 2019 |  |  |
| 2020 |  |  |
| 2021 |  |  |
| 2022 |  |  |
| 2023 |  |  |
| 2024 |  |  |
| 2025 |  |  |
| 2026 |  |  |
| 2027 |  |  |
| 2028 |  |  |
| 2029 |  |  |


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| Year | Costs per AMI meter installed <br> (\$) | Benefits per AMI meter installed <br> (\$) |
| :--- | :---: | :---: |
| 2030 |  |  |
| 2031 |  |  |
| 2032 |  |  |
| 2033 |  |  |

## Response:

 changes in the revenue requirement.

| Benefits |  |  |
| :---: | :---: | :---: |
| F | G | H |
| Benefits in year $\mathbf{\$ 0 0 0}$ [from Net AMI] <br> (Net AMI Lines $30,31,46,47,48,49,50,52]$ | Benefits in aggregate $\$ 000$ [from Net AMI] F+ | Aggregate Benefits per total AMI meters installed to-date <br> G×1000 ${ }^{10}$ |
| -\$529 | -\$529 |  |
| -\$1,733 | -\$2,262 | -\$38.28 |
| -\$2,822 | - $\$ 5.084$ | -\$43.02 |
| -\$6,274 | -\$11,358 | -\$94.32 |
| -\$6,639 | -\$17,997 | -\$146.76 |
| -\$8,734 | -\$26,731 | -\$214.11 |
| -\$8,043 | -\$34,775 | -\$273.76 |
| -\$8,769 | -\$43,543 | -\$337.04 |
| - $\$ 8,654$ | -\$52,198 | -\$397.36 |
| -\$8,283 | -\$60,481 | -\$452.96 |
| -\$8,930 | - $\$ 69,410$ | - $\$ 511.67$ |
| -\$8,734 | -\$78,445 | -\$567.02 |
| -\$9,087 | -\$87,232 | -\$623.26 |
| -\$8,904 | -\$96,136 | -\$676.62 |
| -\$9,156 | -\$105,292 | -\$730.26 |
| -\$9,152 | -\$114,444 | -\$782.34 |
| -\$9,916 | -\$124,360 | -\$838.17 |
| -\$9,873 | -\$134,233 | -\$892.37 |
| - \$10,226 | -\$144,459 | -\$947.57 |
| -\$11,096 | -\$155,556 | -\$1,006.93 |


| Benefits per Meter |  |
| :---: | :---: |
| 1 | J |
| Yearly Benefits per total AMI meters installed to-date | Benefits per AMI meter installed per month in the year |
| F*10008 | IH12 |
|  |  |
| -\$29.32 | -\$2.44 |
| -\$23.88 | -\$1.99 |
| -\$52.10 | -\$4.34 |
| -\$54.14 | -\$4.51 |
| -\$69.96 | -\$5.83 |
| -\$63.32 | -\$5.28 |
| -\$67.87 | -\$5.66 |
| -\$65.88 | -\$5.49 |
| -\$62.03 | -\$5.17 |
| -\$65.83 | -\$5.49 |
| -\$63.38 | -\$5.28 |
| -\$64.93 | -\$5.41 |
| -\$62.67 | -\$5.22 |
| -\$63.50 | -\$5.29 |
| -\$62.56 | -\$5.21 |
| -\$66.83 | -\$5.57 |
| -\$65.64 | -\$5.47 |
| -\$67.08 | -\$5.59 |
| -\$71.83 | -\$5.99 |

The requested table has been expanded to be more descriptive, and provided below. It should be noted that the cost/benefit figures are the raw numbers for each year, and do not represent

Table BCUC IR2 Q88.3 - Benefits per Meter


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### 89.0 Reference: Project Costs/Benefits <br> Exhibit B-6-1, BCUC IR 1.120.1 <br> Reward and Penalties Balancing Account, and Cost Cap

89.1 If the benefits were all recovered through rates, would those who participated in the AMI project not receive their fair benefits?

## Response:

Yes. Please refer to the response to ICG No. 1 Q1.2 and Q2.1.1.
89.1.1 How does FortisBC propose to attribute the cost and benefits amongst is various customer classes that may or may not participate in the AMI program?

## Response:

FortisBC has not proposed any sort of class specific recovery mechanism as part of the proposed Project. As further detailed in the response to ICG IR No. 1 Q1.2, FortisBC anticipates that it intends to conduct a cost of service analysis (COSA) in 2017 after a year of AMI data is available, and anticipates that given the class inclusive nature of the expenditures and benefits, costs will likely be allocated on the basis of common allocation factors developed as part of the COSA.
89.2 Would FortisBC agree to the establishment of a Reward and Penalties Balancing Account for the ratepayers' costs that exceed $+/-10 \%$ of the stated project costs and benefits in the Application?

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Response:
No, FortisBC would not agree to the establishment of a Reward and Penalties Balancing Account for the ratepayers' costs that exceed $+/-10 \%$ of the stated project costs and benefits in the Application. Consistent with all prudently incurred capital expenditures undertaken by the utility, the costs and benefits should be included in the Company's Revenue Requirements and therefore incorporated into customer rates. In addition, incentive/penalty mechanisms are typically used to provide an incentive to the Company to influence its behaviours in those circumstances where that is determined to be appropriate. Many of the benefits of the AMI project, for instance reductions in power theft relate to the behaviors of customers, and not to the behaviors of the Company.
89.2.1 If not, please explain why not.

## Response:

Please refer to the response to BCUC IR2 Q89.2.
89.3 Would FortisBC agree to the establishment of a Cost Cap of $+10 \%$ on the capital cost stated in the Application?

## Response:

No, FortisBC would not agree to the establishment of a Cost Cap of $+10 \%$ on the capital cost stated in the Application. Consistent with all prudently incurred capital expenditures undertaken by the utility, the costs and benefits should be included in the Company's Revenue Requirements and therefore incorporated into customer rates.
89.3.1 If not, please explain why not.

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## Response:

Please refer to the response to BCUC IR2 Q89.3.

### 90.0 Reference: Realization of Benefits

Exhibit B-1, Section 4.0, pp. 40, 41
Exhibit B-1, Section 9.4, pp. 147-148
Customer Groups
90.1 Please identify the individual customer classes that will be rate impacted by the AMI project and at the same time eligible for the benefits flowing from the AMI project.

## Response:

All customers will benefit from the implementation of the AMI Project. Please refer to the response to BCUC IR No. 2 Q120.1, and ICG IR No. 1 Q1.2.
90.1.1 Please explain how FortisBC proposes to confine the rate impacts and benefit to customers classes had have AMI meters installed over the 20 year life of the project.

## Response:

Please refer to the response to ICQ IR No. 1 Q1.2.

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### 91.0 Reference: Realization of Benefits <br> Exhibit B-1, Section 4.2.2, <br> AMI Project Benefits Realization Plan

91.1 Does FortisBC agree that a reporting system to track and monitor performance of the AMI solution if difficult to implement and track all the cost benefits stated in the Application?

## Response:

FortisBC agrees that theft reduction benefits are difficult to track and monitor. Please refer to the responses to BCUC IR2 Q41.3 and Q41.4.

Costs can be tracked with accuracy, as can the other benefits as described in the response to BCUC IR1 Q56.3.
91.2 In the absence of a benefit realization program, please provide comment on the above method of benefit recovery.

## Response:

FortisBC is not certain what the "above method of benefit recovery" is referring to. Please also refer to the response to BCUC IR2 Q91.1.
91.3 Please provide a table by year showing the monthly credit per AMI meter derived from the benefits in the Application based on the AMI project life.

## Response:

Please refer to the response to BCUC IR2 Q88.3.

|  | FortisBC Inc. (FortisBC or the Company) <br> Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project | Submission Date: December 14, 2012 |
| :---: | :---: | :---: |
| FORTIS BC' | Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2 | Page 247 |

91.4 Would this method of tracking the cost benefits flowing to the AMI ratepayer be simpler to implement?

## Response:

No, this method of tracking cost benefits would not be simpler to implement since it still requires measurement of the theft detection benefit (and then divides the total costs or benefits by the number of meters). Please also refer to the response to BCUC IR2 Q91.1.
91.4.1 If not, please explain why not.

## Response:

Please see the response to BCUC IR2 Q91.4.

In Exhibit B-1, Appendix C-4, Benefit Realization, page 7, BC Hydro states "The Smart Metering Program is a large and complex project designed to deliver significant benefits from across several business groups at BC Hydro. The benefits described in this business case pay for the investment in the program. BC Hydro is implementing a formal benefit realization framework, base-lined with the benefit streams identified in this business case, to ensure accountability and transparency in the measurement and reporting of the benefits over time."

In Exhibit B-1, Appendix C-4, Appendix 7: Rate Analysis, page 33, BC Hydro stated "...the Smart Metering Program has initial rate impacts which are reduced over time as the benefits accumulate. In order to better match the initial cost recovery to the timing of benefits realization, BC Hydro will seek BC Utilities Commission approval to "smooth" rate impacts"

In Exhibit B-1, Section 3.2.4, p. 30, FortisBC states "The installation of AMI will save customers approximately $\$ 19$ million on a net present value basis over the 20 year evaluation of the Project." However FortisBC does not clearly elaborate on how these benefits will be realized by the 115,000 residential and commercial customers affected.
As several factors impact any benefit realization program and the claims by FortisBC indicate significant benefits for the affected ratepayers could be realized if the AMI project is executed in a cost effective and timely manner, would FortisBC be agreeably

| FortisBC Inc. (FortisBC or the Company) |  |  |  | Submission Date: <br> December 14, 2012 |
| :---: | :---: | :---: | :---: | :---: |
| Application for a Certificate of Public Convenience and Necessity |  |  |  |  |
| for the Advanced Metering Infrastructure Project |  |  |  |  |$\quad$| Response to British Columbia Utilities Commission (BCUC or the Commission) |
| :---: |
| Information Request (IR) No. 2 |

> to implementing a monthly credit per AMI meter in order to provide some additional certainty regarding the benefits claimed in the Application?
> 91.5 Would FortisBC agree to $100 \%$ of AMI revenue requirement (cost/benefits) being allocated among customer classes utilizing AMI meters when AMI Project costs are recovered in rates?

## Response:

No, FortisBC does not agree. Consistent with all capital expenditures undertaken by the utility, the costs and benefits should be included in the Company's Revenue Requirements and therefore are incorporated into all customer rates. Please also refer to the responses to ICG IR1 Q1.1 and CEC IR1 84.4.2.
91.6 Would FortisBC agree that since the AMI project costs are not evenly across all its customers that separate tariffs should be established for those participating in the AMI project and those who are not participating in the project?

## Response:

Fortis $B C$ does not agree. Consistent with all capital expenditures undertaken by the utility, the costs and benefits should be included in the Company's Revenue Requirements and therefore are incorporated into all customer rates. Only customers that are permitted to choose to not participate in the project (such as any potential "opt-out" customers causing a change in project costs or benefits should be subject to a different tariff rate or charge.
91.6.1 If not, please provide a detailed explanation as to why not. If yes, please explain further.

## Response:

Please refer to the response to BCUC IR2 Q91.6.

| FortisBC Inc. (FortisBC or the Company) |  |  |  | Submission Date: <br> December 14, 2012 |
| :---: | :---: | :---: | :---: | :---: |
| Application for a Certificate of Public Convenience and Necessity |  |  |  |  |
| for the Advanced Metering Infrastructure Project |  |  |  |  |$\quad$| Response to British Columbia Utilities Commission (BCUC or the Commission) |
| :---: |
| Information Request (IR) No. 2 |

1

3
4 Response:
5 Please see the following table:

| FortisBC Inc. (FortisBC or the Company) | Submission Date: <br> Application for a Certificate of Public Convenience and Necessity <br> for the Advanced Metering Infrastructure Project | December 14, 2012 |
| :---: | :---: | :---: |

1


3 Please also refer to the response to BCUC IR2 Q82.1.

|  | FortisBC Inc. (FortisBC or the Company) <br> Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project | Submission Date: <br> December 14, 2012 |
| :---: | :---: | :---: |
| FORTIS BC" | Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 2 | Page 251 |

### 92.0 Reference: AMI Equipment Extended Warranty

## Exhibit B-6, BCUC IR 1.1.2

92.1 Do the vendors offer an extended warranty for the AMI equipment?

## Response:

Due to contractual sensitivities, FortisBC has filed this response in confidence with the Commission.
92.1.1 If so, what is the additional period covered by the extended warranty by equipment type?

## Response:

Please refer to the response to Confidential BCUC IR No. 2 Q92.1.
92.1.2 If so, what is the additional cost of the extended warranty by equipment type?

If so, please explain why FortisBC did not acquire the extended warranty for these equipment types.

## Response:

Please refer to the response to Confidential BCUC IR No. 2 Q92.1. There is no additional cost for the extended warranties.

October 2011

NAME:
HOME ADDRESS:

HOME TELEPHONE:

BUSINESS ADDRESS:

BUSINESS TELEPHONE:

## Curriculum Vitae

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## EDUCATION:

1977-1979: Osgoode Hall Law School, LL.M.
1974-1977: Osgoode Hall Law School, LL.B.
1970-1974: University of Western Ontario. B.A. (Honours Psychology)

I965-1970: C.J. Mackenzie High School, Deep River, Ontario

## PROFESSIONAL HISTORY:

1989- Professor, School of Criminology
Simon Fraser University; Director, School of Criminology, 1987-1988, 1991, 1993-1996.

2004-2011 Chair, Graduate Programs, School of Criminology, and Associate Director, School of Criminology

1986-1987: Director, Criminology Research Centre, Simon Fraser University

| 1983-1989: | Associate Professor, School of Criminology |
| :--- | :--- |
| Simon Fraser University |  |
| 1979-1983: | $\frac{\text { Assistant Professor, School of Criminology }}{\text { Simon Fraser University }}$ |
| Summer, 1974: | $\frac{\text { Probation Officer (Adult) Ontario Department of Probation }}{\text { and Parole }}$ |

Summer, 1973: $\quad$ Research, Non-Medical Use of Drugs Directorate, Health and Welfare, Canada

Summer, 1972: Daily Newspaper Reporter, Stratford, Ontario; Stratford Beacon Herald.

## AWARDS, HONOURS AND GRANTS:

2010: A Thousand Dreams short-listed for the Roderick Haig-Brown Book Prize, B.C., the Donner Prize (best book on Canadian public policy), and winner of the Ryga Award (social awareness in literature).

2008: Named Fellow of the Western Society of Criminology, for contributions to the discipline of criminology.

2004: Named Honorary Director, B.C. Civil Liberties Association
2000: President's Award for Contributions to the Media and Public Relations, Simon Fraser University

1994: Annual Sorokin Lecture, University of Saskatchewan
1990: Award of Excellence, AMTEC
"The Last Dance: Murder in Canada"
1st Place, Educational Video, Canada, 1989.
1977: \$5,000 LL.M. Entrance Scholarship
Osgoode Hall Law School
1974: Dean's Honours List, University of Western Ontario

1973: Dean's Honours List, University of Western Ontario
1973: Nominated for a Rhodes Scholarship, Department of Psychology, University of Western Ontario

## COMMUNITY AND PROFESSIONAL ACTIVITY:

| 2006 to present: | Associate, Canadian Centre on Substance Abuse |
| :---: | :---: |
| 2001 to present: | Member, Board of Directors International Centre for Criminal Law Reform and Criminal Justice Policy (United Nations affiliate), Vancouver, B.C. |
| 2001 to 2006: | Member, Board of Directors Western Society of Criminology |
|  | 2002 to 2005: Member, Board of Directors, Greater Vancouver Regional District, and Councillor, Bowen Island Municipality |
| 1988 to present: | Radio, newspaper articles, and television interviews, keynote presentations and community talks; approximately 100-200 per year |
|  | 1988 to present: Reviewer, Donner Canadian Foundation, SSHRC, Social Problems, University of Toronto Press, Canadian Public Policy, Canadian Journal of Law and Society |
| 1984 to present: | Papers presented at professional conferences (approximately two per year) |
| 1984 to present: | Provision of expert opinion evidence for courts, boards, commissions and tribunals |

## BOOKS:

Canadian Law: An Introduction, 5th Edition, Toronto, Nelson Thomson Publishing, 2010.

A Thousand Dreams: Vancouver's Downtown Eastside and the Fight for its Future, Greystone Books, 2009 (with Lori Culbert and Larry Campbell).

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## MONOGRAPHS:

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A Cost-Benefit and Cost-Effectiveness Evaluation of Vancouver's Supervised Injection Facility, Report for Health Canada, Martin Andresen and Neil Boyd (2 ${ }^{\text {nd }}$ author), 61 p. February, 2008.

Interim Reports, Principal Investigator, Vancouver site, Community Impact Study of the North American Opiate Medications Initiative (Heroin Prescription Trial),, for Health Canada, 2004-2008, Final Report due Fall, 2008.

Eron Mortgage Study, B.C. Securities Commission, Vancouver, B.C., March, 2005, Lead author and principal researcher.

Responding to Aggression in Long Term Care: Lessons from Five Case Studies, Richmond, B.C., (Lead author, with Jan Mitchell and Aili Malm) Worksafe B.C., 2004.

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## ARTICLES:

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## DECISION

QUEBEC
REGIE DE L'ENERGIE \{THE ENERGY BOARD \}

| D-2012-128 | R-3788-2012 | October 5, 2012 |
| :--- | :--- | :--- |

## IN THE PRESENCE OF:

Lise Duquette
Louise Rozon

Richard Lassonde
Managers

## Hydro-Quebec

Complainant
and
The Stakeholders, whose names appear below
Final decision
Request for Rate Setting and Distribution Requirements of electrical Power, pertaining to setup of a Meter without RF emission

## The Stakeholders:

Association coopérative d'économie familiale de l'Outaouais (ACEFO) \{Family
Economics Cooperative Association of Outaouais Region $\}$;
Association coopérative d'économie familiale de Quebec (ACEFQ) \{Cooperative Association of Family economics of Quebec \};

Fédération canadienne de l'entreprise indépendante (FCEI) \{Canadian
Federation of Independent Enterprises $\}$;
Groupe de recherche appliquée en macroécologie (GRAME) \{Group for Applied Research in Macroecology;;

Options consommateurs (OC) \{Consumers' Option\};

Regroupement des Organismes Environnementaux en Énergie (ROEÉ) \{Merger of Environmental Organizations for Energy;;

Stratégies énergétiques et Association québécoise de lutte contre la pollution atmosphérique (S.É./AQLPA) \{Energy
Strategies And Quebec Association
Against Air Pollution\};
Syndicat des employés de techniques professionnelles d de bureau
d'Hydro-Quebec, section locale 2000 (SCFP-FTQ) \{Hydro-
Quebec Technical Technics and Office Employees' Union,
Local 2000\};
Union des consommateurs et Regroupement national des conseils régionaux de
l'environnement du Quebec (UC/RNCREQ) \{Quebec
Consumers' Union and Quebec National Merger of
Regional Councils for the Environment \};
Union des municipalités du Quebec (UMQ)
\{Association of Quebec Municipalities\}.

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THE DEVICE

## 1. INTRODUCTION

[1] On March 15, 2012, during its electric power distribution business, Hydro-Quebec ("The Distributor") approached the Electric Power Board ("The Board") to approve changes to the Terms of service for Electric Power ("The Terms of service"), and to Distributor's Rates and Terms ("The Rates") pertaining to an option to setup a meter without radiofrequency emission ${ }^{1}$ ("The Removal Option"). Such application was filed pursuant to sections 31, Paragraph 1 (1), 48, 49, and 52.1 of the Loi sur la Régie de l'énergie 2 \{The Act On Energy Management\} ("The Act"\}.
[2] On March 22, 2012, the Board made decision D-2012-031, in which it requested the Distributor to publish in some newspapers, and post on its website, a public notice giving any affected individuals preliminary instructions on the hearing it planned to hold for consideration of this application. In the same decision, The Board immediately recognized the Stakeholders to the file on the "Remote Reading Project- Phase 1"" (The Project) as Stakeholders to this case, and requested any individual wishing to be recognized as a Stakeholder so request, but no later than April 5, 2012 at 12 h .
[3] On April 18, 2012, the Board made D-2012-044 decision on the review framework for this case, as well as participation budgets, work session and schedule.
[4] On April 24, 2012, through a working session, participants discussed issues related to the case, in accordance with the framework set by the Board in its D-2012-044 decision.
[5] On May 31st, 2012, the Board rendered D-2012-062 decision about ordinance applications from some Stakeholders, pertaining to Distributor's response to inquiries sent to the Distributor, or the Distributor failing to respond to some questions, and the Stakeholders request for fees.
[6] The hearing was held on June 13, 14, 15, 18, and 20, 2012.

1 Exhibit B-0002.
2 The Act on Energy Management, Ch. R-6.01.
$3 \quad$ File R-3770-2011.
[7] Participants submitted their written argumentation, written from June 28, 2012 to July 11, 2012. On July 11, 2012 the Distributor filed its reply, and the Board began its discussion at that time.
[8] This decision concerns the Distributor's proposals, pertaining to the opt-out option, and is issued following D-2012-127 Decision, which gives the Distributor authorisation to setup over the entire territory it serves, Next Generation Electricity Meters (CNGs).
Consequently, setup of said meters has become the Distributor's new reference offer.

## 2. BACKGROUND

[9] The project aims to replace the existing fleet of electromechanical and electronic meters, with CNGs, and implementation of information technology regarding an Advanced Metering Infrastructure (IMA).
[10] Within review of file R-3770-2011, the Board held a preliminary conference on February 2nd, 2012, during which the Board requested the Distributor to consider the fact that some customers may turn down any setup of CNGs. Therefore, the Board requested the Distributor to submit a solution in this regard.
[11] In response to such request from the Board, the Distributor offered amendments to the Terms of service, and to Rates of opt-out option. Such amendments should allow customers who so wish, subject to certain conditions, to choose setup of a meter without radiofrequency emission (non-communicating meters, or CNCs) instead of a CNG, which will become the Distributor's reference offer within the Project.
[12] Amendments offered by the Distributor are as follows:
O Definition of a CNG in Article 3.1 of Terms of service;
O Terms of opt-out option in Article 10.4 of Terms of service; and
O Costs related to opt-out option, in Article 12.5 (g), (h), (i) of Rates.
[13] The distributor specified that the opt-out option is available without a customer being required to justify his choice.
[14] The Distributor based its proposal on the following principles: the reference offer, the Requester Pays policy, and the complete cost method.

## 3. DEFINITION OF A NEW GENERATION ELECTRICITY METER

[15] The Distributor proposed an amendment to Article 3.1 to Terms of service, in order to add the following definition:

## "3.1 For the purposes of these Terms of service, the following terms are defined:

"New Generation Electricity Meter" will mean a bidirectional radiofrequency communication, which may interact with advanced metering infrastructure, mainly intended to collect, measure and analyze data pertaining to electricity consumption.
[16] Such definition determines what constitutes the new reference offer regarding electricity meters, as approved by the Board in its D-2012-127 decision. The "New Generation Electricity Meter " phrase is found in the proposed Article 10.4 to Terms of service.
[17] According to ACEFQ, the Distributor allegedly introduces through such definition an ability to collect, measure and analyze energy consumption data. According to the Stakeholders, Terms of service do not include collection and analysis of consumption data. The reading feature is included for the explicit and sole purpose of invoicing the customer every month or every two months. Therefore, it opposes said definition, which it deems too broad, and that assumes requirements to access information and protect privacy are met and de facto satisfied.
[18] In addition, ACEFQ considers a definition of "electricity meter without radiofrequency emission" should be provided for the purposes of transparency and clarity.
[19] The Board believes that the definition of a CNG as proposed by the Distributor does accurately and technically describe functionalities of such a meter. As for adding a definition stating "electricity meter without radiofrequency emission," the Board considers that the expression is clear, and does not need to be further explained. In addition, ACEFQ's commentary on operations that should lead to further changes to the Terms of service is beyond the scope of what the Board must decide in this case. Should the introduction of CNGs lead to changes in Distributor's operations, and should such circumstances require other changes to changes to Terms of service or Rates, the Distributor will have such changes approved by the Board. Consequently, the Board approves adding such definition of a CNG to Article 3.1 of the Terms of service.

## 4. TERMS OF OPT-OUT OPTION

[20] The Distributor suggests adding Article 10.4 to the Terms of service ${ }^{4}$ in order to codify all terms of the Opt-out option. Such Section reads as follows:
"10.4. The customer may choose an electricity meter without radiofrequency emission, as determined by Hydro-Quebec. The customer must then submit a written request to HydroQuebec, and pay "Initial reading fees," and "Monthly reading fees," as included in the electricity rates for each subscription. Such request may be submitted any time.

When Hydro-Quebec plans to replace electricity meters in any given region with New Generation Electricity Meters, it sends the customer, at least 30 days before the scheduled replacement, a written notice for such purpose. If a customer submits his request within 30 days of this notice, the customer is entitled to a "Setup Credit," as provided for in Electricity Rates.

Hydro-Quebec will maintain the electricity meter without radiofrequency emission as set up, until the end of the customer's subscription. However, the customer may at any
${ }^{4}$ Exhibit B-0034, pages 17 and 18 of Revised Exhibit B-0006.
time request a new generation electricity meter be set up, and no "Monthly reading fees" be charged to him for the current consumption period.

The following prerequisites apply to this Article:

1. Hydro-Quebec has access to the metering equipment; and
2. The customer's electrical setup is single-phase, no more than 200A, and
3. In the last 24 months, the customer received no notice of service termination under Paragraphs 1-4 of the second paragraph, Article 12.3.;

If a notice of service termination is provided by Hydro-Quebec under paragraphs 1-4 of the second paragraph, Article 12.3 with respect to said subscription, Hydro-Quebec may, without further notice, setup a new generation electricity meter".
[21] The Distributor offers the opt-out option primarily, but not exclusively, to residential customers; for such option, customers will not be required to provide any justification.
[22] In the following sections, the Board deals with the issues raised by the terms set out in proposed Article 10.4.

### 4.1 THE CONCEPT OF A CUSTOMER, AND MULTIPLE METERS WITHIN ONE SINGLE DWELLING

[23] First paragraph of Article 10.4 to proposed Terms of service states:
"10.4
"A customer may choose a reader without radiofrequency emission, as determined by HydroQuebec. Such customer must then submit such written request to Hydro-Quebec, and pay "Initial reading fees" and "Monthly reading fees" as mentioned in the electricity rates for each subscription. Such request may be submitted at any time." [Emphasis added]
[24] According to the Distributor, Terms of service constitute the terms of the electricity service agreement between the Distributor and its customer. Such agreement is effective between the parties only. The Terms of service may not apply to the relationship between a customer and a third party ${ }^{5}$. It is therefore normal and inevitable that only the Distributor's customers may decide to exercise the opt-out option.
[25] Some Stakeholders questioned the usefulness of the opt-out option to appropriately meet concerns of a customer who resides in a dwelling where several CNGs are setup.
[26] The Distributor is aware that the opt-out option will not solve all possible scenarios, but submits that the opt-out option will satisfy the vast majority of customers who are concerned with CNGs. According to the Distributor, a case of multiple electricity meters within a dwelling
affect very few customers. Thus, there are at most 700 cases of electricity meters grouped within dwellings, over 3.8 million customers in the province ${ }^{6}$.
[27] Also, the Distributor underlines that it is not the owner of customers' electrical facilities (poles, customers' connections, bases). It is the building owner's responsibility, within standards governing the location of bases and electricity meters, to choose the location of electricity meters.
[28] S.É./AQLPA asks the Board to take note that the opt-out option is not a solution for customers who live in a home where several installed meters are in inhabited rooms. The Stakeholder considers it desirable to offer technological alternatives in such cases ${ }^{7}$.
[29] Likewise, UC/RNCREQ submitted that such issue is real, and that replacing only one of such electricity meters does not meet the need expressed by citizens regarding their health concerns.
[30] Thus, according to UC/RNCREQ, the occupant will inevitably bear the costs of an opt-out option for all CNCs which are installed in his dwelling. This would make a very expensive
${ }^{5}$ Exhibit B-0056, page 7.
${ }^{6}$ Exhibit A-0020, page 164.
${ }^{7}$ Exhibit C-SÉ-AQLPA-0013, page 23.
and prohibitive exercise of the opt-out option, and this would not be a valid solution in these cases.
[31] According to UC/RNCREQ, the Board should require from the Distributor to offer pricing terms that are fair, equitable and realistic in cases where several electricity meters exist in a dwelling. Such terms should consider the fact that in these cases, the costs of the opt-out option will be significantly reduced for the Distributor ${ }^{8}$.
[32] According to OC, the Board should request the Distributor to provide a final solution to solve cases where multiple electricity meters are located within a customer's "living room." ${ }^{9}$
[33] As one possible solution to this problem would be to move the electricity meters, the Distributor replies that, should it assume all or part of such costs, all customers will have to bear them. This would violate the Requester-Payer policy, and would not be an acceptable solution according the Distributor ${ }^{10}$.
[34] The Board agrees with the Distributor's position. The location of electricity meters - whether one or several - is not the Distributor's responsibility, but the building owner's. Terms of service may not govern the contractual relationship between a landlord and a tenant, or between owners. The solution to this problem relates to private law, rather than to the Terms of service.
[35] The issue of health effects of radiofrequency from CNGs, whether individual or grouped within a dwelling, lies beyond the scope of this Application ${ }^{11}$ and is dealt with by the Board in D-2012-127 decision.

### 4.2 TECHNOLOGICAL SOLUTION SELECTED

[36] Section 10.4 of the proposed Terms of service states in its first paragraph:
${ }^{8}$ Exhibit C-UC-RNCREQ-0022, page 28.
${ }^{9}$ Exhibit C-OC-0016, pages 10,11 , and 13.
${ }^{10}$ Exhibit B-0059, page 14.
${ }^{11}$ Decision D-2012-044.
"10.4. A customer may choose a reader without radiofrequency emission, as determined by Hydro-Quebec. Such customer must then submit such written request to Hydro-Quebec, and pay "Initial reading fees" and "Monthly reading fees" as mentioned in the electricity rates for each subscription. Such request may be submitted at any time." [Emphasis added]
[37] The Distributor wishes the opt-out option to reflect the current situation, namely, the use of a meter without any further feature than recording energy consumed, which must be read manually.
[38] In addition, the choice of a meter must meet the following criteria: be consistent with Measurement Canada standards, and be certified according to the Distributor's standards ${ }^{12}$. Finally, supply to electricity meters must be ensured.
[39] To this end, the Distributor considered three technology solutions: either using electromechanical meters again; or using electronic meters with a telephone modem, read by MV- $90^{13}$ and CNC, or an electronic meter with no communication card ${ }^{14}$.
[40] Of these three solutions, the Distributor chose the CNC, as such technology meets all the above features. According to the Distributor, this solution can meet needs expressed by customers who wish to exercise their opt-out option, while ensuring an economically viable solution and compliance with regulations. Given the current state of technology, the Distributor submits that this technical solution is similar to those currently offered or under consideration in other jurisdictions offering such alternative ${ }^{15}$.
[41] The Distributor states it has not selected the option to keep electromechanical meters, as for the most part, they exceeded their useful life, and are no longer manufactured. Therefore, it argues that the supply of such electricity meters and parts required for repair, is not guaranteed ${ }^{16}$.
${ }^{12}$ Exhibit B-0006, page 8.
${ }^{13}$ An option made of a dedicated phone line, with an electronic meter which includes an analog telephone modem, and a data acquisition system with a data warehouse.
${ }^{14}$ Exhibit B-0029, page 6.
${ }^{15}$ Exhibit B-0056, pages 11 and 12.
${ }^{16}$ Exhibit B-0056, page 12.
[42] The Distributor did not either select the option of using electronic meters, with a telephone modem, read by MV-90, as the costs are too high for the residential market. This technology raises some issues because of its impact on information technologies architecture (IT), as it operates with a particular architecture. Finally, supply in meters with an analog telephone modem is not guaranteed in the future ${ }^{17}$.
[43] According to S.É./AQLPA, in the absence of any other technological alternative which would allow customers choosing the opt-out option to benefit from new features in CNGs without radiofrequency emission, the Distributor should temporarily maintain current electromechanical meters, until the end of their useful life or until the installation of electricity meters with such new feautres ${ }^{18}$.
[44] UC/RNCREQ also recommends the Board request the Distributor wait before making its technological selection on CNC, and in the meantime, use electromechanical meters or Automated Meter Reading, which still have a useful life of three years at least ${ }^{19}$.

## "ON-OFF" Remote Meter

[45] GRAME states it was not convinced the Distributor has appropriately assessed the possible various technological choices to offer its customers an opt-out option in 2012.
[46] The Stakeholder expressed its concern, as the technological solution adopted by the Distributor will not allow tiered pricing in the long term, nor most of the IMA features ${ }^{20}$.
[47] Taking the example of technological choices made by two utilities companies, in Maine and California, GRAME suggested the solution consisting of ON-OFF remote radio meters, or an IMA meter with the ability to lay in dormancy and reactivate the remote telecommunication card.
${ }^{17}$ Exhibit B-0029, page 6.
${ }^{18}$ Exhibit C-SÉ-AQLPA-0018, page iv.
${ }^{19}$ Exhibit C-UC-RNCREQ-0022, page 20.
${ }^{20}$ Exhibit C-GRAME-0013, page 3.
[48] GRAME alleges it would be better to refrain from making a decision that may be irreversible or cause unavoidable effects. Thus, an immediate decision by the Board on the technological solution proposed by the Distributor would have long-term consequences on technological choices. The Stakeholder thus recommends that the Board ask the Distributor to assess costs, pros and cons of the "remote ON-OFF" technology, and compare it to that which is currently available. This would enable the Board to make an informed decision on a choice of technological opt-out option ${ }^{21}$.
[49] According to the Distributor, the main reason for rejecting radio meters with "remote ONOFF" is that it is not available on the market today. To the Distributor's knowledge, none of the major network suppliers offers this as an operating technology.
[50] In addition, the Distributor states that although it is possible to remotely set meters to OFF, the action required to set them back to $O N$ normally requires an employee travel and perform an on-site action, using the optical port on the meter. However, for security reasons, the Distributor intends to block the optical port on meters. Therefore, to set it back ON, the meter should be removed and returned to the workshop ${ }^{22}$.
[51] The Distributor adds it does not wish to wait until such GRAME-recommended technology is available. In addition, it is impossible for the moment to determine whether this technological solution would comprehensively satisfy the concerns of the various Stakeholders ${ }^{23}$.

## Carrier-current cable

[52] ROEÉ considers that CNCs penalize customers twice. Not only must the customer pay a fee for the opt-out option, but he also will be deprived of all benefits a CNG offers ${ }^{24}$.
Therefore, ROEÉ recommends that the Board require the
${ }^{21}$ Exhibit C-GRAME-0013, page 9.
${ }^{22}$ Exhibit A-0020, page 14.
${ }^{23}$ Exhibit B-0056, page 15.
${ }^{24}$ Exhibit C-ROEÉ-0025, page 9.

Distributor to consider the solution of a communication by current-carrier cable (CCC) by more exhaustively assessing said alternative ${ }^{25}$.
[53] ACEFO's claims are similarly oriented ${ }^{26}$. According to the Stakeholder, the Distributor did not analyze other technological alternatives such as meters which communicate via radio rather than via radiofrequency.
[54] At the hearing, ROEÉ's expert, Mr. Bertsch, presented four scenarios pertaining to costs to implement communication via CCC. The following table shows that for all four cases, the cost per customer would be between $\$ 128$ and $\$ 182$.

## Cost Scenarios ${ }^{27}$

## Total Costs Cost by customer Number of

## Customers

Assumption \# $1 \quad$ All of Quebec $\$ 688,880,000$ million $\$ 181.28$ 3,800,000

Assumption \# $2 \quad$ European Companies $\$ 4,256,000,000 \quad \$ 128.97$ 33,000,000

Assumption \# 3 Montreal (Over 50 customers per transformer) \$15,995,200 \$128.32 124,60

Assumption \# 4
All of Montreal
\$122,192,920 \$131.52 929,111
[55] Also, Mr. Bertsch states that the cost per customer was calculated according to the assumption that all Distributor's customers would be served by CCC, and not only those who would request the opt-out option ${ }^{28}$. He admits that costs would be higher if CCC were offered only to those customers who choose the opt-out option ${ }^{29}$.
${ }^{25}$ Exhibit C-ROEÉ-0020, pages 16 and 17.
${ }^{26}$ Exhibit C-ACEFO-0008, page 20.
${ }^{27}$ Excerpts from Exhibit C-ROEÉ-0022, pages 7 and 8.
${ }^{28}$ Exhibit A-0024, page 167.
${ }^{29}$ Exhibit A-0024, pages 186-187.
[56] During discussions, ROEÉ submits that the maximum cost to setup the solution of a communication via CCC would be $\$ 520$ per customer who selects the opt-out option. ROEÉ concludes that the cost of the "worst case scenario" is much less than the cost of $\$ 9000$ or $\$ 13,000$ made by the Distributor, which explains it prematurely quit analysing the CCC solution ${ }^{30}$.
[57] According to the Distributor, none of the vendors who responded to the call for tenders for the project suggested such communication technology via CCC. To his knowledge, some European projects implementing a smart metering solution use CCC, but such choice is mainly due to the specifications of the electrical network architecture in Europe, and is not transferable to the Distributor's network ${ }^{31}$.
[58] The Distributor also states that CCC would require implementing a second technological infrastructure across the province, to meet requests from all regions, which would be extremely expensive.
[59] According to the Distributor, the CCC option, based on European technology, requires setting up hubs and telecommunications links to each of the 582,000 transformers within the distribution network. Such technology is deployed in Europe on electrical systems which are completely different from North American networks. No large-scale deployment of such equipment would be made in North America, due to several technical constraints that remain to be analyzed.
[60] At the hearing, the Distributor states it did not select the communication technology via CCC since a preliminary estimate for all of Quebec predicted a cost of about nine thousand dollars $(\$ 9,000)$ per customer ${ }^{32}$.
[61] Finally, the Distributor underlined that such technology would not help in responding to some concerns expressed by the Stakeholers ${ }^{33}$. Unlike CNG technology, the advanced security solution for individual data protection
${ }^{30}$ Exhibit C-ROEÉ-0028, page 17.
${ }^{31}$ Exhibit B-0029, page 14.
${ }^{32}$ Exhibit A-0026, pages 10 and 20.
${ }^{33}$ Exhibit B-0056, pages 13 and 14.
offered by Landis+Gyr, the selected supplier, is not available for this technology ${ }^{34}$.

## Coaxial cable and fiber optic

[62] Finally, some Stakeholers ${ }^{35}$ suggested another technological option, where the meter would be connected to A provider's cable, such as Videotron, or else to the fiber optic network used by Bell Canada.
[63] According to the Distributor, there is to date no solution via coaxial cable or fiber optic, as there is no supplier offering it to the residential markets at an affordable cost ${ }^{36}$.

## The Board's Opinion

[64] Based on all the evidence in this case, the Board considers the CNC technological solution suggested by the Distributor is appropriate.
[65] Indeed, the Board believes that maintaining electromechanical meters for customers requesting the opt-out option is not viable for reasons stated by the Distributor.
[66] Similarly, particularly due to excessively high costs for the residential market, the MV-90 technology, as well as those of the coaxial cable or fiber optic, is not technological solutions to be considered for the opt-out option.
[67] In addition, the CCC option as preliminarily considered by the Distributor, was rejected by the latter for several reasons, including information security and costs; and the Board supports such reasons ${ }^{37}$.
[68] According to ROEE, the communication solution via CCC, if offered only to customers who select the opt-out option, would cost $\$ 520$ per meter. Although this
${ }^{34}$ Exhibit A-0026, page 49.
${ }^{35}$ ACEFQ, ROEÉ, S.É/AQLPA
${ }^{36}$ Exhibit B-0029, page 6.
${ }^{37}$ Exhibit B-0056, pages 13 and 14.
hypothesis proves correct, the cost would be well above the cost proposed by the Distributor for CNC, which would make access to opt-out option much more elaborate.
[69] Concerning the suggestion to set up meters with remote radio ON-OFF, the Board accepts the Distributor's reasons, to the effect that this type of meter is not currently available on the market, and none of the major suppliers of networks offers such technology as operational. In addition, the Board is of the opinion that evidence does not help in deciding whether this technological solution may satisfactorily respond to the various stakeholders' concerns.
[70] Thus, the Board concludes that the CNC is the least expensive solution, while taking into account the specifications of the Distributor's network. In addition, this technology helps in addressing the main concerns expressed by customers who request the opt-out option.

### 4.3 THE REQUESTER-PAYER POLICY

[71] Article 10.4 of the proposed Terms of service states in its first paragraph:
"10.4. A customer may choose a reader without radiofrequency emission, as determined by Hydro-Quebec. Such customer must then submit such written request to Hydro-Quebec, and pay "Initial reading fees" and "Monthly reading fees" as mentioned in the electricity rates for each subscription. Such request may be submitted at any time." [Emphasis added]
[72] The Distributor pointed out that the Distributor's Terms of service determine the "reference offer" as being an offer made to the requester, in order to supply an electric setup.
However, once the project is authorized by the Board, the Distributor will exclusively setup CNGs, and meter reading will become an automated activity ${ }^{38}$. Thus, a customer who would like a CNC may exceptionally have it set up but it will be a personal choice separate from the reference offer ${ }^{39}$.
${ }^{38}$ Exhibit B-0024, page 8.
${ }^{39}$ Exhibit B-0056, page 4.
[73] The Distributor submitted that with the deployment of CNGs, manual reading will no longer be part of the basic service offered by the Distributor. Consequently, measuring electricity using a CNC will be at the expense of those who request ${ }^{40}$ such an electricity meter. Thus, customers who exercise the opt-out option in accordance with the Requester-Payer Policy and to maintain neutral rates, will pay the cost of a new meter setup (Initial reading fees) and the cost of manually reading their meter (Monthly reading fees).
[74] According to the Distributor's proposal, a customer wishing to exercise the opt-out option should submit a request for any subscription to a new address, and pay applicable fees.
[75] The Distributor submits that all customers do not have to bear additional costs caused by customers who choose a meter other than the reference meter ${ }^{41}$.
[76] GRAME, UMQ, FCEI, and OC support the Requester-Payer Policy, and therefore, any billing additional costs caused by the opt-out option.
[77] However, UMQ and FCEI add that the Distributor's proposal does not ensure neutral rates, since the Distributor fails to take certain costs into account, so that its proposal is not neutral for the rest of the customer base ${ }^{42}$.
[78] UMQ considers that requirements to exercise the opt-out option should meet strict rate neutrality, because exercising such option cannot be justified by health or safety reasons, as reported by authorities qualified in the issue ${ }^{43}$.
[79] OC recognized the validity of the Distributor's calculation methods, including the use of the method of a full cost hourly rate ${ }^{44}$. However, OC considers the initial setup costs should not apply in cases where the CNC is the first electricity meter

40 Exhibit B-0056, page 4.
41 Exhibit B-0056, page 4.
42 Exhibit C-FCEI-0010, page 3.
43 Exhibit C-UMQ-0006, pages 12-13.
44 Exhibit C-OC-0016, page 7.
be set up, since such situation does not require any further action from the Distributeur ${ }^{45}$.
[80] S.É./AQLPA and UC/RNCREQ submit similar proposals. Thus, S.É./AQLPA recommended that no setup fee be required from a customer who exercises the opt-out option at the same time as a massive deployment, and when a CNC is the first meter to be set up ${ }^{46}$. UC/RNCREQ also believes the Board should deny Initial setup fee requirement, when the existing electricity meter must be changed because it reached the end of its life or because his operation is faulty ${ }^{47}$.
[81] With respect to new constructions, the Distributor states that for most new connections, setting up metering equipment is coordinated with the manufacturer before a subscriber moves. A CNG will be automatically setup. If a subscriber wants a new CNC, the Distributor must replace the CNG setup at the subscriber's expense. The Distributor submitted that such situation does not justify including exception clauses to the Terms of service when they are likely to generate additional costs ${ }^{48}$.
[82] In addition, UC/RNCREQ, ACEFQ, ACEFO, S.É./AQLPA and ROEÉ reject the RequesterPayer Policy.
[83] The position of these Stakeholders on the Requester-Payer Policy is based on three (3) elements: the qualification of the reference offer, application of the precautionary principle, and social equity.

## Qualification of the reference offer

[84] UC/RNCREQ contends that the Requester-Payer Policy is not always fair and equitable. In this case, it should not be fully applied to customers
${ }^{45}$ Exhibit C-OC-0016, page 8.
${ }^{46}$ Exhibit C-EG-AQLPA-0018, page 58.
${ }^{47}$ Exhibit C-UC-RNCERQ-0022, page 9.
${ }^{48}$ Exhibit B-0059, page 14.
who use the opt-out option, since such service should be part of the Distributor's reference offcer ${ }^{49}$.
[85] Similarly, ACEFQ considers that the essential function of an electricity meter is to measure electricity consumption. The method by which it is read is then secondary. For this reason, since CNG and CNC meters and CNG and CNC allow measuring, despite a different reading method, both electricity meters should be included in the Distributor's reference offer.

## Precautionary principle

[86] ACEFQ believes that CNGs involve potential risks to health and privacy protection; and that, faced with these risks, the precautionary principle should apply ${ }^{50}$.
[87] Accordingly, ACEFQ considers that applying the precautionary principle is a ground to justify no charges for opt-out option. According to the Stakeholder, sharing costs to the opt-out option among all customers who exercise their opt-out option would not only be reasonable, but would make it accessible ${ }^{51}$.
[88] ACEFO considers that, if it was necessary to apply the Requester-Payer Policy, its fair, appropriate and correct application would require the Distributor, user or polluter of the consumer's space to transmit consumption data via radiofrequency, and pay for costs associated with the opt-out option. As a result, it required these costs be included with costs of the entire Project ${ }^{52}$.
[89] S.É./AQLPA and ROEÉ submitted that the reason or underlying principle to the opt-out option is the precautionary principle. According to these Stakeholders, the Requester-Payer Policy should not take precedence over the precautionary principle. They therefore call for a no charge opt-out option.
${ }^{49}$ Exhibit C-UC-RNCREQ-0022, page 18.
${ }^{50}$ Exhibit C-ACEFQ-0007, page 4.
${ }^{51}$ Exhibit C-ACEFQ-0018, page 5.
${ }^{52}$ Exhibit C-ACEFO-0016, page 5.

## Social equity

[90] ROEE believes the Requester-Payer Policy is discriminatory to low-income households, which will be more penalized than other customers by this type of mesure ${ }^{53}$.
[91] ACEFQ was also concerned that the Initial setup cost and Monthly reading fees could be a barrier for low-income households to the exercise of the opt-out option. As a result, the Stakeholder emphasises that no charge be levied for opt-out to all those who exercise such option, thereby avoiding creating eligibility criteria on the basis of subscribers' income.

## The Board's Opinion

[92] The Board reiterated that the opt-out option will reflect the personal choice of those who do not wish to avail themselves of the Distributor's reference offer, which is to setup CNGs all over the territory it serves. Such opt-out option may be exercised at any time, without any explanation being required by the Distributor.
[93] The Board believes that the opt-out option, being an exceptional action, is outside the scope of the reference offer.
[94] With respect to the Requester-Payer Policy, the Board agrees with the Distributor, FECI, OC, GRAME and UMQ wishing such policy to apply to exercising the opt-out option, since it is a customer's personal choice, associated with a requirement to bear the costs. With respect to applying this principle, the Board addressed this issue in Section 5 of this Decision.
[95] With respect to some Stakeholders' arguments aimed at justifying a cost-free opt-out option under the precautionary principle, the Board cannot accept these arguments when considering findings in this respect in D-2012-127 decision made this day.
[96] As regards the wording in Article 10.4 of the suggested Terms of service, the Board considers that the term "Initial metering costs" is confusing. According to recorded
${ }^{53}$ Exhibit C-ROEÉ-0016, page 9.
evidence, such phrase targets in fact the CNC setup cost. Customers should be able to clearly differentiate between the lump sum payable on CNC setup, and monthly fees related to meter reading.
[97] Therefore, the Board requests the Distributor modify the phrase "Initial metering fee" to "Setup fee" for both Terms of service and Rates. To avoid any confusion between the phrases "Initial metering fee" and "Setup fee" in the next sections of this Decision, the Board will use the phrase "Setup fee" to describe such costs.
[98] Likewise, the Board considers the phrase "Monthly reading fee" also confusing. According to the recorded evidence, such phrase targets in fact fees associated with CNCs reading.
Therefore, the Board requests the Distributor modify the phrase "Monthly metering fee" for "Monthly reading fee" both in Terms of service and Rates. To avoid confusion between the phrases "Monthly measurement" and "Monthly fee" in the next sections of this Decision, the Board hall use the phrase "Monthly reading fees" to describe such costs.

### 4.4 INITIAL SETUP COSTS AND END OF SUBSCRIPTION

[99] The third paragraph of Article 10.4 of the suggested Terms of service states that the Distributor will maintain the CNC until the end of the customer's subscription. The Distributor outlines that upon ending a customer subscription with opt-out option, the Distributor will systematically and promptly setup a $\mathrm{CNG}^{54}$. According to the Distributor, there would only be a low probability that this customer's move out would occur on the same day as an opt-out customer moving into the same building ${ }^{55}$.
[100] When asked about the possibility of granting a reflecting period for the new customer to decide whether he will take advantage of the opt-out option where a CNC is already setup, the Distributor submits that this procedure would have significant impact on its operating costs.
${ }_{55}^{54}$ Parts B-0013, page 3, A-0020, pages 139-143.
${ }^{55}$ Exhibit B-0054, page 3.
[101] Such a solution would require, on the one hand, the introduction of a new specific business process and, on the other hand, significant changes to systems to properly refer these customers outside the normal moving / relocation activity. Furthermore, the codification of this action would only benefit a very small number of customers, while its implementation costs would be borne by the entire customer base ${ }^{56}$.
[102] Finally, the Distributor argues that the initial setup cost must be applied to all customers who exercise the option to opt-out, even those who move where a CNC is already setup. Doing otherwise would be unfair, because the beneficiaries of the opt-out option service may pay different amounts whether a CNC is or is not at a location.
[103] GRAME believes that if a new tenant wants to keep the already set-up CNC, the initial cost should not be charged ${ }^{57}$ against him.
[104] S.É./AQLPA also believes that the Distributor should allow reasonable time to the new occupant in order to decide whether he will keep or replace the CNC, and contact the Distributor ${ }^{58}$ for such purpose.
[105] The Board believes that the purpose the Distributor would remove a CNC to replace with a CNG at the end of a subscription is consistent with the reference offer. The Board therefore considers it appropriate for the Distributor to systematically replace a CNC with a CNG.
[106] However, the idea to charge initial setup fees where a CNC is already in place and a new subscriber requests to join the opt-out option is not justified under the Requester-Payer Policy.
[107] To reconcile these two situations, the Board is of the opinion that the initial setup costs should not be charged if, when the customer selects the opt-out option, a CNC which was setup at the former subscriber's expense still exists at delivery point delivery.
${ }^{56}$ Ibid.
${ }^{57}$ Exhibit C-GRAME-0013, page 12.
${ }^{58}$ Exhibit C-EG-AQLPA-0018, page 56.
[108] Accordingly, the Board asks the Distributor to submit an amendment to suggested text in Article 10.4 (1) of the Terms of service, to reflect the fact that the Initial setup fees will not be charged to the customer if, when the customer joins the opt-out option, a CNC is present at point of delivery.

### 4.5 TIME TO OBTAIN SETUP CREDIT

[109] Article 10.4 of the proposed Terms of service states in the second paragraph:
"10.4 [...]

When Hydro-Quebec plans to replace electricity meters in a given region with new generation electricity meters, it will send the customer, at least 30 days before the scheduled replacement date, a written notice to that effect.
If the customer makes his request within 30 days of this notice, the customer is entitled to "setup credit" provided for in electricity rates."[Emphasis added]
[110] This proposal from the Distributor seeks to subtract from the full cost of a CNC setting up, the average expected cost for setting up CNGs in the framework of the massive project deployment ${ }^{59}$. The 30-day period is intended for delivery of notices sent by the Distributor to change the electricity meter within the massive deployment ${ }^{60}$.
[111] This setup credit will not be granted for setting up a CNC in the case of new buildings and in areas where massive CNG deployment is completed.
[112]GRAME recommends that like the Central Maine Power, the Distributor would allow customers with sufficient grounds not to meet said 30-day deadline, yet still receive setup credit ${ }^{61}$.
${ }^{59}$ Exhibit B-0023, page 4.
${ }^{60}$ Exhibit B-0024, pages 5 and 6.
${ }^{61}$ Exhibit C-GRAME-0013, page 10.
[113] The Board deems satisfactory the Distributor's proposal to subtract a setup credit from Initial setup fees. The Board also agrees with the Distributor that said setup credit not apply in cases mentioned in paragraph 112 of this Decision.
[114] The Board did not accept GRAME's proposal of granting a credit past the deadline. Should a credit for setting up a CNC be offered after this massive deployment, then the entire customer base should bear these costs, which would violate the aforementioned Requester-payer.

### 4.6 SUBSCRITION TERM, AND "EXIT FEES"

[115] Article 10.4 of the proposed Terms of service states in the third paragraph:
Hydro-Quebec maintains meters without radio frequency emission as set up until the end of the customer's subscription. However, the customer may at any time request the setup of a new generation electricity meter and no "monthly measurement" will be charged for the current consumption period.

Hydro-Quebec will maintain the electricity meter without radiofrequency emission as set up until the end of the customer's subscription. However, the customer may at any
${ }^{4}$ Exhibit B-0034, pages 17 and 18 of Revised Exhibit B-0006.
time request a new generation electricity meter be set up, and no "Monthly reading fees" be charged to him for the current consumption period.
[116] The Board believes that the Terms of service constitute the terms of the electricity service agreement between the Distributor and its customer. In this context, the Board agrees with the Distributor's proposal, that the opt-out option ends when the customer terminates his subscription or when the customer requests to return to the reference offer.

### 4.7 PREREQUISITE: ACCESS TO THE READING DEVICE

[117] Article 10.4 of the proposed Terms of service states in the fourth paragraph:
"10.4 [...]
The following prerequisites apply to this article:

1. Hydro-Quebec has access to the metering equipment, and
2. The customer's electrical setup is single phase and not more than 200A, and
3. In the last 24 months, the customer received no notice of service termination under Paragraphs 1-4 of the second paragraph, Article 12.3. [Emphasis added]
[118] The Distributor underlines the following:
"The actions referred to in Article 13.1 are initiated by the Distributor, either by obligation, such as meter reading, or sampling, or in the course of its operations. Therefore, in some cases, the Distributor must make significant efforts to gain access to its metering equipment." [...]

To the contrary, the opt-out option will be exercised at the initiative of a Distributor's customer. For this purpose, the Distributor does not wish to interfere in the relationship between a customer who would be a tenant, and his landlord, and secondly, the Distributor does not wish to incur additional costs to set up a non-communicating meter. Thus, the Distributor believes it is the responsibility of the customer who wishes to exercise the opt-out option to provide access to the Distributor, and to take all steps required from third parties to do so. Adding to legal text a customer's obligation to ensure access to electricity meter as a prerequisite to exercise the optout option will avoid any ambiguity in this regard and clarify conditions for all the parties upon reading the relevant section of the regulation. ${ }^{162}$
[119] Several Stakeholders recommended deleting the first requisite because it would be redundant with provisions of Article 13.1 of the
${ }^{62}$ Exhibit B-0017, page 15.

Terms of service, which already provide that access to the metering equipment is a prerequisite for the delivery of electricity to a customer.
[120] ACEFQ further submits that transferring the obligation of ensuring access to the meter onto the customer who exercises the opt-out option represents a constraint and a useless condition ${ }^{63}$.
[121] FCEI believes that the Distributor, especially under the Act on Electricity and Gas Inspection ${ }^{64}$, has legal and regulatory tools to access meters. Even if it raises redundancy with Article 13.1 of Terms of service, the Stakeholder considers that it would be more effective than the Distributor to take the initiative in case of an inability to access, rather than the customer. The Stakeholder fears that this eligibility requirement would create a precedent where it would be acceptable to offer options to customers who should employ additional legal means to join.
[122] Agreeing with FCEI arguments, UC/RNCREQ adds the Distributor does justify this prerequisite by the fact it does not wish to interfere with landlord-tenant relations. However, this Stakeholder believes the submitted text does not solve the problem, since it only applies to access to metering equipment, a requirement which is already mentioned and detailed in Article 13.1 of the Terms of service ${ }^{65}$.
[123] Likewise, S.É./AQLPA recommends the Board not accept this prerequisite nor any other new rule that would ensure the option be conditional on a subscriber's ability to have access to his meter from a third party, or that would give Hydro-Quebec discretion to not contact third parties in order to efficiently gain such access ${ }^{66}$.
[124] In response to FCEI and S.É./AQLPA, the Distributor mentioned it does not consider it appropriate to take coercive steps to gain access to meters. It will act in good faith, as it does in the normal course of business, to
${ }^{63}$ Exhibit C-ACEFQ-0018, page 6.
${ }^{64}$ L.R.C. 1985, Ch.E-4.
${ }^{65}$ Exhibit C-UC-RNCREQ-0022, page 25.
${ }^{66}$ Exhibit C-S.É.-AQLPA-0018, page 37.
help its customers find solutions and, if necessary, will agree to act as a mediator between the customer and third parties ${ }^{67}$.
[125] The Board believes that the first question is whether this prerequisite is redundant with that provided for in Article 13.1 of Terms of service.
[126] According to the Board, there is no redundancy between such provision of Article 10.4, and Article 13.1 of the Terms of service. The intention of provision 10.4 (4) 1) is that the customer is not entitled to opt-out if the Distributor is unable to access the Customer's meter. It is therefore a penalty for denying access to the meter. Access denial to metering equipment in accordance with Articles 13.1 and 12.3 of the Terms of service may, in turn, lead to service termination.
[127] The second issue the Board must decide on, is whether the penalty provided for in Article 10.4. (4), 1) is reasonable.
[128] The penalty already provided for in Article 12.3 (6) of the Terms of service for access denial to the meter would normally lead to service termination. The Board does not find such a penalty is appropriate in the case of the opt-out option.
[129] The Board considers that the customer who exercises the opt-out option is responsible for taking any step to ensure the Distributor has access to the meter and therefore set up a CNC.
[130] However, in order to avoid possible confusion between this prerequisite to exercise the opt-out option and Article 13.1 of the Terms of service, the Board does not give any authorisation, as formulated in proposed paragraph 10.4 (4) 1). It requests the Distributor to submit a text which essentially reflects the following: the customer who requests the Distributor to set up a CNC must take action, and obtain the necessary approvals for the Distributor to access the customer's electricity meter as per requirements mentioned in paragraph 3, Article 13.1 of the Terms of service.

[^20]
### 4.8 PREREQUISITE: ELECTRICAL SETUP IS SINGLE-PHASE, AND UP TO 200A

[131] Article 10.4 of the proposed Terms of service states in the fourth paragraph:

## "10.4

The following prerequisites apply to this Article:

1. Hydro-Quebec has access to the metering equipment;
2. The customer`s electrical setup is single-phase, and up to 200A;
3. In the last 24 months, the customer received no notice of service termination under Paragraphs 1-4 of the second paragraph, Article 12.3. [Emphasis added]
[132] The Distributor states that this prerequisite helps in offering the opt-out option to approximately $95 \%$ of its customers, most customers belonging to G and DT rate groups.
[133] The experience of pilot projects indicates that customers affected by this prerequisite showed no interest in the opt-out option. Indeed, all requests for removal or refusal to install a CNG within pilot projects originated from residential customers supplied with $120 / 240 \mathrm{~V}$ singlephased voltage ${ }^{68}$.
[134] The Distributor submits this prerequisite is necessary, since in the case of a three-phased electrical system or that of a single phase electrical input over 200A, the power can be invoiced.
[135] In addition, the Distributor states that extending the opt-out option to all electrical installations would force it to increase the number of meter types, and purchase small quantities of some meter types. With this requirement, the Distributor wishes to standardise the types of meters used,
${ }^{68}$ Exhibit B-0056, page 9.
particularly due to Measurement Canada`s regulations on meter certification \({ }^{69}\). [136] UC/RNCREQ does not challenge this prerequisite to exercise the opt-out option \({ }^{70}\). [137] The Board believes that eliminating this prerequisite could actually lead to an increase in the number of meter types, and to buying small amounts of some meter types. [138] In addition, the Board notes from the Distributor`s evidence, that the experience of pilot projects show that opt-out requests or refusal to setup a CNG within pilot projects originated from residential customers, whose electric setup was single-phased, and not more than 200A.
[139] Finally, the Board noted that neither FCEI, nor other associations of business or industrial consumers, oppose this requisite.
[140] Accordingly, the Board approves the second prerequisite, as proposed by the Distributor.

### 4.9 PREREQUISITE: NOTICE OF SERVICE TERMINATION

[141] Article 10.4 of the proposed Terms of service states in the fourth paragraph:
"10.4 [...]
Article 10.4 of the proposed Terms of service states in the fourth paragraph:

The following prerequisites apply to this Article:

1. Hydro-Quebec has access to the metering equipment;
2. The customer`s electrical setup is single-phase, and up to 200A;
3. In the last 24 months, the customer received no notice of service termination under Paragraphs 1-4 of the second paragraph, Article 12.3. [Emphasis added]

[^21][142] Under this prerequisite, only a customer who has not, in the last 24 months, received a notice of service termination under paragraphs 1-4 of the second paragraph, Article 12.3, would be eligible for the opt-out option.
[143] The Distributor considers it important that the opt-out option may not be used by a customer wishing to evade collection actions and, more specifically, remote service termination. Since the termination notice is the step before service termination in the collection process, the Distributor believes that customers who received a termination notice in the last 24 months show a high enough risk of non-payment to justify denial of the opt-out option ${ }^{71}$.
[144] ACEFO considers such requisite is unjustified, since only $14 \%$ of termination attempts were unsuccessful due to an inability to access the meter. According to the Stakeholder, it would be unfair to deprive of their opt-out option all customers who received a notice of service termination, so the Distributor would have access to meters. The Stakeholder asks this term be scrapped ${ }^{72}$.
[145] ACEFQ believes that the Distributor did not prove customers who received termination notices in the last 24 months increased the risk level of bad debts, and therefore considers the requisite as arbitrary or discriminatory ${ }^{73}$. The ACEFQ believes that the only requirement justifying why a customer does not have the right to opt-out should be limited to customers who are late in or in default of payment ${ }^{74}$.
[146] According GRAME, should the Board accept this requisite, application thereof should not be retroactive. Indeed, according to the Stakeholder, when a customer received a termination notice, he could not be aware of the impact such notice would have on his right to exercise the opt-out option. Such requirement would therefore be against the rules of procedural equity
${ }^{71}$ Exhibit B-0006, page 10.
${ }^{72}$ Exhibit C-ACEFO-0016, page 9.
${ }^{73}$ Exhibit C-ACEFQ-0018, paragraph 42.
${ }^{74}$ Exhibit C-ACEFQ-0018, paragraphs 42 and 43.
and the presumption that a provision has no retroactive effect, unless expressly specified ${ }^{75}$.
[147] OC considers that Articles 9.1 and 9.6 of the Terms of service do not entitle the Distributor to opt-out its technological offer to customers who meet their payment obligations. The Stakeholder believes customers who meet their payment obligations after receiving a notice of discontinuance should be able to avail themselves of the opt-out option. OC advises the Board to limit the scope of this requirement only to customers whose termination notice is still active ${ }^{76}$.
[148] UC/RNCREQ understands the Distributor's concern to exclude "bad payers" from the optout option. However, it submits that the current wording is too demanding. The Stakeholder suggests the following wording: "In the past 24 months, the customer did not receive more than one notice of service termination under paragraphs 1-4 of the second paragraph, Article 12.3, and it is up to date in paying payable bills." ${ }^{77}$
[149] Although the Board is concerned with the level of bad debts to the Distributor, it does not consider the requisite under section 10.4 (4) 3) is fully justified. Thus, having a CNC does not exempt any customer from the Distributor's collection actions, including service termination, but only from the possibility it be done remotely.
[150] Customers who will have CNC, but will not pay their account, will be manually terminated, as is currently done. Termination costs and reinstatement costs provided for in the Terms of service will be calculated on a deterrence basis, and the Distributor may charge the customer if necessary. If such costs were no longer representative, the Distributor may then request the Board modify rates to remedy this issue.
[151] In addition, the Board is not certain that many subscribers choose to exercise the opt-out option, with costs involved, to try to avoid a remote service termination. Finally, it must be remembered that good faith is always presumed.

[^22][152] The Board believes this requisite would effectively and without any justification, deprive customers who paid their bill, from their right to exercise the opt-out option. However, the Board considers it reasonable to assume OC's recommendation to limit the scope of such requirement only to those customers whose service termination notice is still in force. Accordingly, the Board requests the Distributor rephrase the prerequisite in Article 10.4 (4) 3), by limiting its scope to only those customers whose termination notice is still in force.

### 10.4 TERMINATION TERM: NOTICE OF SERVICE TERMINATION

[153] Article 10.4 of the proposed Terms of service states in the fifth paragraph:

## "10.4

If a notice of termination of service is provided by Hydro-Quebec under paragraphs 1-4 of the second paragraph, Article 12.3 with respect to subscription, Hydro-Quebec may, without further notice, setup a new generation electricity meter".
[154] For the same reasons as those related to the third prerequisite, the Distributor provided a requisite for termination of the opt-out option when a service termination notice is provided under paragraphs 1-4 of the second paragraph, Article 12.3, in relation to said subscription ${ }^{78}$.
[155] The Distributor insists that receipt of a termination notice is a reliable criterion for assessing the risk of a bad debt. More than $30 \%$ of customers who receive a notice of service termination actually see their service terminated.
[156] According to the Board, the corollary to the Distributor's argument is that nearly $70 \%$ of Customers who receive a termination notice are not terminated. Thus, denying these customers the right to exercise the opt-out option is out of proportion with the problem discussed.

[^23][157] The Board considers that the following conditions more adequately deal with the Distributor's bad debt problem:

- The Distributor may setup, without further notice, a CNG meter if the electricity delivery service is terminated under paragraphs 1-4 of the second paragraph, Article 12.3 of the Terms of service;
- In such case, the subscriber could not reapply in order to exercise the opt-out option before expiry of a 24 -month period following service termination, by paying initial fees.


## [158] The Board therefore requests the Distributor submit a text containing the terms described above.

### 11.4 MONITORING AND INFORMATION FOR SUBSCRIBERS

[159] S.É./AQLPA recommends the Board to include in the Terms of service an obligation for the Distributor to periodically inform its customers, including the features of its reference offer and opt-out option. According to the Stakeholder, this would allow customers to make informed choices, including for prevention ${ }^{79}$.
[160] ACEFO believes that all information relevant exercising the opt-out option should be provided to customers so they may make an informed decision ${ }^{80}$.
[161] In reply, the Distributor reminded participants that Article 2.1 of the Terms of service already provides for a general obligation to inform. According to the Distributor, nothing justifies opting-out would present greater constraints in terms of information as other provisions relating to electricity delivery ${ }^{81}$.
[162] The Board does not consider it useful to add special provisions to Service terms that the Distributor should provide customers. The Distributor's
${ }^{79}$ Exhibit C-EG-AQLPA-0018, pages 46-50.
${ }^{80}$ Exhibit C-ACEFO-0016, page 2.
${ }^{81}$ Exhibit B-0059, page 15.
general duty to inform under Article 2.1 of the Terms of service is sufficient.

## 5. COSTS RELATED TO OPT-OUT OPTION

[163] The Distributor proposes to codify the costs associated with exercising the opt-out option at Article 12.5 of Rates.
[164] According to the Distributor, the proposed fees reflect the costs for customers who choose to join the opting-out. To estimate the number of customers who wish to join the opting-out, and thus establish the setup fee and monthly fee, the Distributor uses data from markup and pilot projects. The Distributor estimates the number of participants to the opt-out option to be about $1 \%$ of the 3.6 million customers in whose dwelling it will setup a CNG within the Project.
[165] The Distributor states that such costs are uniform and appear in the rates. This process helps the efficiency of its operations, because no specific calculation in each case will be required.
[166] ACEFQ, ACEFO, SCFP-FTQ and UC/RNCREQ expressed their doubts on the number of customers who wish to avail themselves of the opt-out option. Some of these Stakeholders requested the Distributor conduct studies or surveys on that subject.
[167] GRAME submitted a review on American opt-out programmes: Based on this limited sampling of opt-out programs, it appears that utilities can generally expect to experience an opt-out rate of $0.5 \%-1.5 \%$ of the residential customer population depending primarily on the amount of fees. However, some of the utilities with opt-out costs projected to be on the low end of the cost spectrum have not yet begun to deploy smart meters on a high volume basis, so actual data is not yet available »82
${ }^{82}$ Exhibit C GRAME-0007, page 5.
[168] Considering the evidence on file, the Board deems as reasonable the Distributor's estimate, to the effect that one percent (1\%) of customers would join the opt-out option. The Board notes that all assumptions on which the Distributor set the costs of opting-out should be reviewed during subsequent rate reviews, when the project is more advanced and the accuracy of assumptions may be validated.

### 5.1 INITIAL SETUP COSTS

[169] Article 12.5 of the proposed Rates states:
"12.5 [...]
g) Costs of initial metering

An amount of \$137
h) Monthly metering costs

A monthly fee of $\$ 17$ divided according to the billing cycle
i) Setup credit

A \$39 amount " [Emphasis added]
[170] The Distributor offers flat setup initial fees of $\$ 137^{83}$. Such fees are determined according to the method provided for in Article 17.1 of the Terms of service, and include the cost of CNC setup (\$121.80), and the cost of processing the request by the Distributor's Customer Service (\$14.76).
[171] To determine these costs, the Distributor uses the full cost method. Hourly rate for an installer includes cost of travel and performance of work, cost of required equipment, such as tools and vehicle, as well as a portion of the costs related to support activities which are required to complete the work.
${ }^{83}$ Exhibit B-0034, page 18.

| Cost of meter setup | Average time to setup <br> 0.87 hour | Hourly rate, at full rate at March 31, 2012 $\$ 140$ | $\begin{aligned} & \text { Total } \\ & \$ 121.80 \end{aligned}$ |
| :---: | :---: | :---: | :---: |
| Cost of processing customers' requests | Time spent by Customer Service to process request <br> 0.12 hour | Hourly rate, at full rate, for a CSR at March 31, 2012 $\$ 123$ | Total <br> \$14.76 |

Source: Excerpts from Exhibit B-0006, pages 13 and 14
[172] The Distributor considers it appropriate not to include the cost of returning to the reference offer in its costs, so as to maximize the number of CNGs and optimise the use of IMAs to benefit all its customers. The Distributor considers costs to relocate a CNG could be a disincentive to return to the reference offer ${ }^{84}$.
[173] The Distributor suggests initial costs of a CNC set up be charged to the customer and included in the customer's invoice, and payable in one payment ${ }^{85}$.
[174] The Distributor indicates that these costs will be updated on the same basis and at the same frequency as all other prices, costs and expenses specified in Chapter 12 of Rates ${ }^{86}$.
[175] FCEI asks the Board to ensure all costs for opting out be taken into account into the optout option to calculate proposed costs ${ }^{87}$. In particular, the FCEI estimates that the cost of relocating a CNG should be taken into account to calculate fees charged to customers exercising their opt-out option.
[176] According to FCEI, such an approach would be consistent with how the cost of "termination-reinstatement" process was established within R-3535-2004. The Stakeholder believes the cost of relocating an intelligent meter
${ }^{84}$ Exhibit B-0055, page 3.
${ }^{85}$ Exhibit B-0006, page 15.
${ }^{86}$ Exhibit B-0006, page 12.
${ }^{87}$ Exhibit C-FCEI-0014, page 4.
is the natural and direct consequence of the opt-out option, because if the smart meter had not been removed to start with, or if it had been set up during massive deployment, it would not have been set up again ${ }^{88}$.
[177] UMQ also believes that the Distributor should, with fees charged to the customer who exercises an opt-out option, include possible costs of relocating any CNG. The Stakeholder Believes that the Requester-Payer Policy should be maintained, and that the relative complexity of billing may not serve as an argument to override this principle ${ }^{89}$.
[178] UMQ recommends the Board ensure costs for setting up CNCs also take into account costs incurred by the Distributor to cover failed visits to perform its setup ${ }^{90}$.
[179] On the other hand, UC/RNCREQ argues that the proposed fees do not consider the cost differential between a CNC and a CNG. The Stakeholder notes that the cost of CNCs represents approximately $50 \%$ of the cost of meters to be set up in the Project. In so doing, UC/RNCREQ believes the setup fee should be reduced by an amount equal to the difference in purchase costs for those meters ${ }^{91}$.
[180] UC/RNCREQ submitted that the setup fee is a new rate and thus a rate increase for customers wishing to avail themselves of the opt-out option. According to it, under section 48 of the Act, the Distributor should attach a document describing the impact of such an increase on low-income households, which it failed to do. Because of this omission, UC/RNCREQ requests that initial setup fees be denied, or the Distributor required presenting the impact of this increase on low-income households, and solutions it intends to apply to mitigate this impact.
[181] In response to UMQ and FCEI, the Distributor reiterated that costs related to the relocation of CNGs will be part of the Distributor`s basic services and should not be charged.
In addition, the Distributor is convinced that the addition of such
${ }^{88}$ Exhibit C-FCEI-0007, page 3.
${ }^{89}$ Exhibit C-UMQ-0011, page 10.
${ }^{90}$ Exhibit C-UMQ-0011, page 5.
${ }_{91}$ Exhibit C-UC-RNCREQ-0007, page 3.
fees upon exit would be a deterrent to many customers who might otherwise want to take advantage of its reference offer ${ }^{92}$.
[182] With respect to the impact of initial setup fees on low-income households, the Distributor points out that Article 52.1 of the Act does not allow special discounts to low-income households. Rates must be uniform for all customers within the same rate category, except for independent distribution networks North of the $53^{\text {rd }}$ parallel. However, the Distributor notes that in the course of normal business, appropriate payment arrangements are offered to low-income households. Such agreements apply to the total customers' bill.
[183] The Board recognizes that the Distributor's proposal with respect to the opt-out option, based on the Requester Pays Policy, is not full cost. Indeed, although most setup and reading costs are included in fees that the Distributor proposes to charge customers, other costs, such as the cost of relocating CNGs for a customer wanting to return to the reference offer, are not included.
[184] However, the Board agrees with the Distributor that it is important to find a balance between the need to make the customer pay any costs resulting from his choice, and accessibility to the opt-out option. This is why it does not accept proposals from FCEI and UMQ. Including CNG relocation costs with initial setup fees would be a significant roadblock to accessibility to opt-out option.
[185] Likewise, the Board does not accept the UC/RNCREQ proposal to reduce initial setup fees by an amount representing the difference in the purchase cost of CNC meters and the purchase cost of CNG meters. Although the cost of a CNC is lower than the cost of a CNG, the gap does not produce any savings for the Distributor, if it must return to the reference offer.

[^24][186] As for the proposal to offer low-income households a special rate, the Board accepts the Distributor's argument that the Act requires uniform rates by categories.
[187] For these reasons, the Board considers initial setup fees of $\mathbf{\$ 1 3 7}$ to be fair and reasonable, as proposed by the Distributor. The Board is satisfied that such fees do represent the average cost to setup a CNC for a customer who wishes to opt out.
[188] Finally, the Board notes that such initial setup fees will be updated on the same basis and at the same frequency as all other rates, costs and expenses related to power supply operations.

### 5.2 MONTHLY READING FEES

[189] Article 12.5 of the proposed Rates states:
"12.5 [...]
g) Initial metering fees

The amount of \$137
h) Monthly metering fees

A monthly $\$ 17$ amount, distributed according to invoicing cycle
i) Setup credit

The amount of $\$ 39$ [Emphasis added]
[190] In areas where CNGs will be setup, the Distributor proposes that recurring costs related to implementation of a manual reading mode for CNCs be invoiced on a monthly basis, as for the subscription fee ${ }^{93}$.
[191] The Distributor estimates at \$206 annual costs to read a meter within the opt-out option, as can be seen in the table below. These costs represent a monthly amount of $\$ 17$.

| Fees for manual reading <br> within the framework of opt- <br> out option | Average time for reading <br> Hourly rate, complete cost, as <br> of March 31, 2012 | $\$ 94$ hour |
| :--- | :--- | :--- |
| Subtotal |  |  |
| Number of readings |  |  |
| Total | $\$ 33.66$ |  |
|  | $\$ 201.96$ |  |
| Fees associated with <br> Information Technologies | Costs for information <br> technology development are <br> assessed at $\$ 650,000$ and <br> amortized over a 5-year period | $\$ 3.61$ |

Source: Excerpts from Exhibit B-0006, pages 14 and 15
[192] The cost of manual reading is a CNC is assessed based on travel time required to perform this action ${ }^{94}$. In addition, reading fees are determined on the basis of maintaining the Distributor's current practice to perform six meter readings per year.
[193] The Distributor also mentioned that costs associated with IT are essentially related to IT developments required to enable identification and tracking of requests during meter setups and integration of new charges on the customer's electricity bill, so as to avoid sending separate invoices. These costs are assessed at $\$ 3.61$ per customer in the first year ${ }^{95}$.
${ }^{93}$ Exhibit B-0006, page 15.
${ }^{94}$ Exhibit B-0006, page 15.
${ }^{95}$ Exhibit B-0006, page 15.
[194] According to ACEFO, changing the reading frequency could help in reducing the monthly fee in CNC reading. The Stakeholder submitted that the customer who submits the opt-out option is responsible for choosing the appropriate frequency depending on costs involved ${ }^{96}$.
[195] UC/RNCREQ makes a similar proposal. In its opinion, a reading every 120 days would comply with the Terms of service and imply a 3-reading frequency per year, or half the number of readings used by the Distributor as a basis to assess monthly fees. If necessary, more frequent readings could be performed through self-readings ${ }^{97}$.
[196] S.É./AQLPA also recommends reducing reading costs through self-readings for at least some periods of the invoicing cycle ${ }^{98}$.
[197] FCEI requests the Board include the cost of managing reading routes into calculation of the opt-out cost. The Stakeholder considers $\$ 40$ is the yearly cost per customer for managing reading routes. In addition, FCEI estimates that the cost to access a meter should be assessed and taken into account in pricing the reading fees for the opt-out option ${ }^{99}$.
[198] GRAME favours the method of determining costs according to average time for service at complete cost ${ }^{100}$. The Stakeholder is nevertheless of the opinion that the Distributor should assess other procedures in remote areas, where the population density is lower. Thus, the Distributor may consider actual readings every four or six months or any other way of reading meters, according to needs and challenges encountered ${ }^{101}$.
[199] OC requests a reduction of $\$ 17$ to the monthly amount. Such charge seems too high compared with the subscription fee, and the Stakeholder is concerned about the prohibitive costs for low-income households. In addition, since each residential customer already pays, aside from the subscription fee, the cost generated by the electrical utility, or

[^25]namely costs associated with the setup, meter reading, measuring, OC believes it necessary to ensure there is no double charging Customers who choose the opt-out option ${ }^{102}$.
[200] OC suggests that the manual reading service no longer be included in the customer reference offer when the project deployment phase in the customer's area concludes. As a result, monthly reading fees would commence when the project deployment is completed in said area.
[201] UC/RNCREQ also believes there would be double charging customers using the opt-out option. Indeed, the latter would pay for meter reading costs, which are included in service costs and basic fees, while assuming the financial impact of the project, and they also will have to pay for reading their own meters ${ }^{103}$.
[202] Should the Board accept the principle of reading costs, UC/RNCREQ believes such costs should be applicable only from the time the project is implemented throughout Quebec, so as to avoid different rates depending on geographical regions, which would violate Articles 5 and 49 of the Act.
[203] In reply, the Distributor states it is essential to charge fees from the date a CNC is set up, at whatever step of CNG implementation, in order to avoid fluctuating costs, maintain at all times a realistic price signal, comply with territorial uniformity principle, and ensure not to undermine the efficiencies achieved by a massive optimal deployment of the project.
[204] As to some Stakeholders' suggestions about the frequency of CNC readings and selfreadings, the Distributor states that reducing reading frequency to three times a year does not mean the annual fee would be reduced in the same proportion. In addition, it mentioned that such reduction in readings frequency would be contrary to the Board's directives to maintain a 120day reading frequency, but in practice perform a 60 -day reading.
${ }^{102}$ Exhibit C-OC-0012, page 12 and 13.
${ }^{103}$ Exhibit C-UC-RNCREQ-0022, page 11.

The Distributor adds that 120 days would significantly increase estimates, especially for customers who do not complete self-readings ${ }^{104}$.
[205] The Board notes that a customer exercising the opt-out option will already pay the monthly subscription fees, which includes fees for meter reading. The Distributor states that costs of readings total $5.85 \phi$ per day and per subscription, or $\$ 1.75$ per month.
[206] Although aware of this fact, the Board does not consider it necessary to lower the level of monthly subscription fees for customers who exercise the opt-out option. The Board believes that as implementation progresses, benefits of IMA network will result in cutting costs included in the subscription fee, including costs of meter reading, as well as an increase in benefits for the entire customer base.
[207] With respect to the frequency of CNC readings, the Board does not consider it appropriate to limit readings to 120 days only to reduce annual reading costs. Due to high fixed costs, the Board believes that this approach would increase problems caused by differences between customers' estimated billing and actual consumption, without significantly reducing the monthly fee.
[208] The Board accepts the Distributor's proposal to charge an annual fee of \$206 and its monthly distribution of $\mathbf{\$ 1 7}$. According to the Board, this fee represents the average reading cost for customers who wish to opt-out.

### 5.3 SET UP CREDIT

[209] Article 12.5 of proposed Rates states:
${ }^{104}$ Exhibit B-0059, page 13.
"12.5 [...]
g) Costs of initial metering

An amount of $\$ 137$
h) Monthly metering costs

A monthly fee of \$17 divided according to the billing cycle
i) Setup credit

A \$39 amount" [Emphasis added]
[210] The distributor offers to subtract from initial setup cost of a CNC, the average cost to setup a CNG within the massive deployment of the Project. The average weighted cost for setting up a CNG is $\$ 39^{105}$.
[211] The Distributor proposes to offer this $\$ 39$ setup credit to customers who exercise the opt-out option within 30 days after sending the letter informing them a CNG meter is being set up.
[212] The distributor explains that such credit is its avoided cost, or the average cost to setup a CNG by its service provider within the Project, or by the Distributor in some special cases.
[213] UC/RNCREQ disputes this Distributor`s statement, since it allegedly confirmed that the electricity meter value is taken into account in the contract with the set up service provider. UC/RNCREQ concludes that such credit does not specifically reflect the cost of setting up a meter and would therefore not be based on accurate and controllable data ${ }^{107}$.
${ }^{105}$ Exhibit B-0056, page 18.
${ }^{106}$ Exhibit B-0028, page 13.
${ }^{107}$ Exhibit C-UC-RNCREQ-0007, 4th page.
[214] OC requests the Board ensure the $\$ 39$ CREDIT also includes costs indirectly related to the CNG setup within the massive deployment, including all support activities necessary to setups ${ }^{108}$.
[215] The Board does not agree with UC/RNCREQ and OC regarding the setup credit and considers that, although the cost may include some overhead, this credit is essentially the average cost of a meter setup.
[216] The Board accepts and considers as fair and reasonable, the Distributor's proposal to offer customers a $\$ 39$ credit which is the avoided cost when setting up a CNC within the massive deployment of the Project.

## [217] For these reasons,

The Board:

ACCEPTS partially the Distributor's request;
APPROVES amendment to Article 3.1 in the Terms of Electricity Service as proposed by the Distributor;

APPROVES partially Article 10.4 in the Terms of Electricity Service as proposed by the Distributor and ORDERS the Distributor make changes as required by this Decision;

APPROVES partially Article 12.5 of Terms and Rates as proposed by the Distributor and ORDERS the Distributor to make the changes required by this decision;

ORDERS the Distributor to file, no later than October 25, 2012 at 12 pm , a new text for Terms of Electricity Service and distributor`s Rates and Terms, which must reflect required changes set out in various sections of this Decision, as well as an English version of this document;
${ }^{108}$ Exhibit C-OC-0016, page 7.

ORDERS the Distributor comply with all other decisions contained in this Decision.
Lise Duquette
Manager

Louise Rozon

Manager

Richard Lassonde

Manager
Representatives:

- Association coopérative d'économie familiale de l'Outaouais (ACEFO) represented by Stéphanie Lussier;
- Association coopérative d'économie familiale de Québec (ACEFQ) represented by Denis

Falardeau;

- Fédération canadienne de l'entreprise indépendante (FCEI) represented by André Turmel;
- Groupe de recherche appliquée en macroécologie (GRAME) represented by Geneviève Paquet;
- Hydro-Québec represented by Jean-Olivier Tremblay and Marie-Josée Hogue;
- Option consommateurs (OC) represented by Éric David;
- Regroupement des organismes environnementaux en énergie (ROEÉ) represented by Franklin S.

Gertler;

- Stratégies énergétiques et Association québécoise de lutte contre la pollution atmosphérique (S.É./AQLPA) represented by Dominique Neuman;
- Syndicat des employé-e-s de techniques professionnelles et de bureau dHydro-Québec, section locale 2000 (SCFP-FTQ), represented by Richard Bertrand;
- Union des consommateurs (UC) et Regroupement national des conseils régionaux de
l'environnement du Québec (RNCREQ) represented by Hélène Sicard;
- Union des municipalités du Québec (UMQ) represented by Steve Cadrin.


[^0]:    1
    http://www.ipu.msu.edu/library/pdfs/Deloitte\%20Requlated\%20Utilities\%20Manual\%20rebranded\%20042012\%20( 1).pdf

[^1]:    1

[^2]:    ${ }^{2}$ http://www.bcuc.com/Documents/Proceedings/2011/DOC 28031 B-1 FBC-Revenue-Requirements-Application.pdf
    3 http://www.bcuc.com/Documents/Proceedings/2011/DOC 28031 B-1 FBC-Revenue-Requirements-Application.pdf

[^3]:    ${ }^{4}$ http://www.bcuc.com/Documents/Proceedings/2011/DOC_28649_B-7_FBC-Responses-BCUC-BCOAPO-Loss-IRs.pdf
    ${ }^{5}$ http://www.fortisbc.com/About/RegulatoryAffairs/ElecUtility/Documents/FortisBC_Responses_to_BCUC_System_Losses_IR2 _210ct11.pdf

[^4]:    ${ }^{6}$ Barnett J, Timotijevic L, Shepherd R, Senior V. Public responses to precautionary information from the Department of Health (UK) about possible health risks of mobile phones. Health Policy. 82:240-250, 2007
    ${ }^{7}$ Timotijevic L. Barnett J. Managing the possible risks of mobile telecommunications: public understandings of precautionary action and advice. Health, Risk and Society. 8:143-164, 2006.
    ${ }^{8}$ Wiedemann PM, Schütz H. The precautionary principle and risk perception: experimental studies in the EMF area. Environ Health Perspect. 2005;113:402-405.
    ${ }^{9}$ Wiedemann PM, Schütz H. Informing the public about information and participation strategies in the siting of mobile communication base stations: an experimental study. Health Risk Soc. 10:517-534, 2008.
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[^5]:    ${ }^{11}$ http://www.bcuc.com/Documents/Guidelines/2010/DOC 25326 G-50-10 2010-CPCN-Application-Guidelines.pdf

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    ${ }^{13} \underline{\text { http://www.surrey.ca/files/Commercially Viable Indoor Marihuana Growing Operations in British Columbia.pdf }}$

[^7]:    ${ }^{14}$ http://www.bcuc.com/Documents/Proceedings/2012/DOC 29557 FBC\%20Inc-RIB Decision-WEB.pdf

[^8]:    ${ }^{15}$ http://www.cbc.ca/news/canada/edmonton/story/2012/03/13/edmonton-firefighter-marijuana-bust.html

[^9]:    ${ }^{16}$ http://politicalticker.blogs.cnn.com/2012/11/07/colorado-washington-pass-marijuana-legalization-oregon-says-no/
    ${ }^{17}$ Robin Room et al., Cannabis Policy: Moving Beyond Stalemate, Oxford, Oxford University Press, 2010, page 39

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    19 http://www.rcmp-grc.gc.ca/drugs-drogues/pdf/drug-drogue-situation-2007-eng.pdf
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    ${ }^{21}$ http://www.globalnews.ca/toronto+police+see+dramatic+rise+grow+operation+busts/4567200/story.html
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[^12]:    ${ }^{24}$ http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/riioed1/consultations/Documents1/RIIOED1SConOverview.pdf

[^13]:    ${ }^{25}$ Derived from - James Bonbright, Principles of Public Utility Rates, Columbia University Press, 1961, page 291

[^14]:    ${ }^{26}$ http://www.fortisbc.com/About/Newsletters/Powerlines/Documents/Powerlines February2007.pdf

[^15]:    ${ }^{27}$ http://www.capelightcompact.org/library/2010/08/3.31.10-Residential-Smart-Home-Energy-Monitoring-Final-EvaluationReport.pdf

[^16]:    ${ }^{28}$ http://www.bcuc.com/Documents/Guidelines/2010/DOC 25326 G-50-10 2010-CPCN-Application-Guidelines.pdf

[^17]:    ${ }^{29}$ http://mitei.mit.edu/publications/reports-studies/future-electric-grid

[^18]:    ${ }^{30}$ Non-traditional recovery was defined for Collaborative discussion purposes as anything other than recovery of costs in the context of a general rate case.

[^19]:    ${ }^{31}$ http://articles.philly.com/2012-10-11/news/34364508 1 sensus-meters-landis-gyr-ag-smart-meters

[^20]:    ${ }^{67}$ Exhibit B-0059, page 5.

[^21]:    ${ }^{69}$ Exhibit B-0006, page 10.
    ${ }^{70}$ Exhibit C-UC-RNCREQ-0022, page 11.

[^22]:    ${ }^{75}$ Exhibit C-GRAME-0013, page 11.
    ${ }^{76}$ Exhibit C-OC-0016, page 6.
    ${ }^{77}$ Exhibit C-UC-RNCREQ-0022, pages 25 and 26.

[^23]:    ${ }^{78}$ Exhibit B-0034, page 18.

[^24]:    ${ }^{92}$ Exhibit B-0059, pages 10 and 11.

[^25]:    ${ }^{96}$ Exhibit C-ACEFO-0016, page 8.
    ${ }^{97}$ Exhibit C-UC-RNCREQ-0022, page 13.
    ${ }^{98}$ Exhibit C-SÉ.-AQLPA-0013, page 60.
    ${ }^{99}$ Exhibit C-FCEI-0010, page 8.
    ${ }^{100}$ Exhibit C-GRAME-0006, page 19.
    ${ }^{101}$ Exhibit C-GRAME-0006, page 18.

