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October 26, 2021

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Mr. Patrick Wruck, Commission Secretary

Dear Mr. Wruck:

Re: FortisBC Energy Inc. (FEI)

Project No. 1599211

Application for a Certificate of Public Convenience and Necessity (CPCN) for Approval of the Advanced Metering Infrastructure (AMI) Project (Application)

Response to the British Columbia Utilities Commission (BCUC) Information Request (IR) No. 1

On May 5, 2021, FEI filed the Application referenced above. In accordance with the regulatory timetable established in BCUC Order G-302-21 for the review of the Application, FEI respectfully submits the attached response to BCUC IR No. 1.

FEI is filing the responses to BCUC IR No. 1 14.3 and 14.8 on a confidential basis pursuant to Section 18 of the BCUC's Rules of Practice and Procedure regarding confidential documents, as set out in Order G-15-19, to preserve commercially sensitive information which, if disclosed, could prejudice or negatively impact the bidding process or FEI's ability to negotiate.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Parties

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A. PROJECT NEED

1.0 Reference: PROJECT NEED

Exhibit B-1 (Application), Section 4.3.2.4.1, pp. 59–60

System Resiliency

On page 59 of the FortisBC Energy Inc.'s Application for a Certificate of Public Convenience and Necessity (CPCN) for the Advanced Metering Infrastructure (AMI) Project (Application), FEI states:

> If at any point during a gas supply emergency FEI deems it necessary to reduce load to balance the system, AMI would allow for surgical reduction of load to minimize the disruption of service to customers. AMI would also allow FEI to confirm that interruptible customers have complied with any requests to adjust their gas usage. Finally, the Company would be capable of measuring the impact of appeals to the public to reduce load, minimizing the service interruption to customers.

FEI's application on page 60 states: "… a controlled shutdown would also allow the Company to define which meters are required to be temporarily interrupted so critical services can continue operating in the section of the system that has been shut down."

1.1 How frequently (per annum) does FEI experience a gas supply emergency on its system which results in service disruption to customers?

Response:

Damage to distribution services and mains (typically due to third parties contacting FEI infrastructure) are the most frequent type of gas supply emergency resulting in service disruptions to customers. In recent years, these distribution emergencies have affected a single customer or as many as hundreds of customers. Interruptions to transmission service can result in more significant disruptions. An example is the 2018 Westcoast T-South incident resulted in service disruptions to all FEI interruptible customers.

The following table provides information on the number of distribution emergencies that have resulted in a service disruption to customers in recent years:

Year	2016	2017	2018	2019	2020	Average
Total Number of Incidents	1,104	1,269	1,219	1,076	983	1,130
Total Number of Customers	2,234	2,040	1,314	2,303	1,173	1,813

1.2 Please categorize the reasons for these gas supply emergencies.

Response:

More than 95 percent of the gas supply emergencies that result in service disruption to customers are caused by third-party damage to FEI's system. The balance of service disruptions to customers are a result of planned and unplanned repairs to FEI's gas system, or upstream events such as the Westcoast T-South incident.

The number of third-party damages per year are as follows:

Year	2018	2019	2020	Average
Total	1,201	1,069	973	1,081

1.3 Please explain the steps FEI has taken or could take to reduce the frequency or consequence of a gas supply emergency on its system.

Response:

The frequency and consequences of potential gas supply emergencies on FEI's system can vary significantly.

On one end of the spectrum, and as stated in the response to BCUC IR1 1.2, third-party system damage is the cause of most gas supply emergencies. These events occur frequently (on average, approximately three third-party damages occur each day of the year), but are relatively low consequence events which only result in supply disruptions to single, or occasionally tens or hundreds of customers. FEI undertakes numerous activities to reduce the number of third-party damages which include:

- Ongoing and extensive public communications to increase awareness of the need to Call or Click Before You Dig;
- Participation in industry associations, such as BC 1 Call and the BC Common Ground Alliance; and
- Employing damage-prevention investigators who investigate incidents and target contractors that are likely to cause future system damages.

On the other end of the spectrum are potential wide-scale and prolonged gas supply disruptions, such as the Westcoast T-South pipeline rupture in October 2018. A no-flow event such as this during cold winter conditions could result in a gas supply disruption to all Lower Mainland customers. While the annual probability of this event occurring is relatively low, the cumulative probability of an event occurring on the T-South system becomes significant over time. For this reason, FEI has proposed the need for the Tilbury LNG Storage Expansion (TLSE) Project which will mitigate the risk of a low-probability, but high-consequence, no-flow outage on the T-South system. Further, in the TLSE Project CPCN application, FEI identified how system resiliency is best addressed using a portfolio approach. The portfolio of solutions includes storage (to address short-term and significant supply disruptions), increased pipeline supply (to provide long-term regional supply), and load control (to balance demand with supply of the system through significant supply disruptions.) The shutoff valves included in the advanced meters will provide this load control functionality.

While the AMI Project will not address the frequency of occurrence of a no-flow event, the real-time monitoring of the gas system combined with the shutoff valve capability within the advanced meters, will allow FEI to mitigate the consequences to customers of significant gas supply disruptions. Consequently, together the proposed AMI and TLSE projects will reduce the frequency and consequences of a gas supply emergency and increase the overall resiliency of FEI's gas delivery system.

1.4 Please explain what is meant by 'critical services' mentioned in the preamble.

1.4.1 Please explain how a service would be determined to be critical.

1.4.1.1 Please explain whether any interruptible customers provide a critical service.

1.4.2 Please explain the consequences if critical services are not operational.

Response:

The applicable emergency preparedness government entity, either provincial or municipal, determines whether a customer is critical and therefore requires a high level of service reliability. FEI would not be the entity determining the criticality of services.

Many customers could be defined as critical (depending upon the specific emergency), but may also be on interruptible rate schedules. Hospitals, as an example, are interruptible customers and provide a critical service; however, hospitals are required by regulation to have an alternate fuel source immediately available capable of supplying the facility for a specified time frame. Other customers could be defined as critical (as determined by the appropriate government entity) while having capability to use an alternate fuel, but may not have a regulatory requirement to have a backup available. Depending upon the season, those customers also may not have their alternate fuel supply available for use.

Prolonged gas supply interruptions to critical services could directly or indirectly affect the livelihood, health, and safety of virtually every resident of the province, regardless of whether they are a customer of FEI or not. Natural gas is an important and often non-discretionary energy source for heating, hot water and industrial purposes. A widespread and/or sustained gas supply disruption could result in significant health and safety risks as was experienced in the state of Texas during the February 2021 winter storm.[1]

1.5 Please discuss FEI's methodology for prioritizing the meters to interrupt so critical services can continue to operate.

Response:

If forced to decrease demand on its system because of a gas supply emergency, FEI would make public appeals as required across the service territory to decrease consumption. FEI would also contact interruptible customers in the vulnerable portion of the system and require the contacted customers to curtail their gas consumption and switch to an alternate fuel source, as stated in the terms and conditions of FEI's interruptible rates.

Further, as part of its response to a potential severe supply shortage as a result of the 2018 Westcoast Energy Inc. (Westcoast) T-South Incident, FEI prepared a System Preservation and Service Restoration (P&R) Plan (which was filed confidentially with, and reviewed by, the BCUC). The P&R Plan includes principles and strategies aimed at maintaining service to as many customers and areas as possible under evolving conditions. The P&R Plan includes curtailment strategies and analysis of customer demand by groups of customers and regions of customers and how FEI could respond under various scenarios. The P&R Plan will evolve as circumstances

[1] https://www.dallasnews.com/news/weather/2021/04/30/number-of-texas-deaths-linked-to-winter-storm-grows-to-151-including-23-in-dallas-fort-worth-area/.

change, such as if additional technical solutions (such as AMI) become available which add greater resiliency to the system.

1.6 Please describe how FEI currently ensures that interruptible customers comply with its request to adjust gas usage.

1.6.1 Please explain the consequences to interruptible customers if they have not complied with an FEI request to adjust their gas usage.

Response:

Customers on FEI's interruptible rate schedules have meters that are connected to a wireless automated meter reading (AMR) device that provides FEI with natural gas consumption once per day. In addition to AMR, some of FEI's largest interruptible customers are also connected to FEI's Supervisory Control and Data Acquisition (SCADA) system for real-time monitoring. FEI currently ensures interruptible customers comply with requests to adjust gas usage by monitoring those customers that have real-time consumption information via FEI's SCADA system. For the remaining interruptible customers, their consumption is collected at the end of the day via AMR and this consumption is reviewed the following day to confirm compliance with requests to adjust gas usage. Interruptible customers are incented to comply with FEI's requests to adjust gas usage as the tariffs have significant penalties for non-compliance and ultimately, FEI has the ability to manually turn gas off, without notice, for not complying with curtailment notices.

While meter technology is different for the larger customers, where possible, FEI intends to connect meters for interruptible customers to the AMI system in order to provide near real-time consumption information for this class of customers. This will not only allow FEI to quickly and accurately determine the current load on the system that is attributable to these customers but also readily identify compliance concerns associated with any FEI requests to adjust gas usage. Timely information will provide benefits including, but not limited to, managing operations of the vulnerable section of the system, as well as determining penalties, if appropriate.

1.7 Please explain the priority or weighting given to the ability to perform a controlled shutdown during a gas supply emergency in determining the need for the AMI Project.

Response:

FEI has not prioritized or applied a weighting to the benefit provided by the AMI Project to perform a controlled shutdown during a gas supply emergency because FEI considers all of the benefits provided by the Project to be important.

2.0 Reference: PROJECT NEED

Exhibit B-1, Section 4.3.2.4.5, p. 61

Customer Safety

On page 61 of the Application, FEI states:

> The remote shut-off capabilities of AMI would provide FEI with the ability to enhance safety for customers, the public and employees when responding to emergencies such as gas leaks or structure fires. Advanced meters can detect large leaks downstream of the meter and be programmed to automatically shut off the internal valve, eliminating any potential for the development of a hazardous situation. The advanced meter would provide an alarm to FEI indicating the meter's internal valve has closed because of a high flow rate. Customers could be notified about the alert and may be able to safely remain in their homes while they wait for FEI to investigate the alert.

2.1 Please explain, with rationale, whether FEI intends to deploy the leak detection and automatic shut-off capability for all customers.

Response:

FEI intends to deploy the leak detection and automatic shutoff capability for all customers.

To implement leak detection, data analytics will be used to analyze hourly consumption information. As this functionality will rely on the frequent transmission of data from the meter, any premises with meters not connected to the network will not have leak detection capabilities until such time as they are connected and transmitting.

The automatic shutoff capability can be used whether or not the meter is connected to the AMI network. The advanced meter firmware will be configured to detect unusually large flow rates through a meter, and the detection of a predetermined high flowrate ('large leak') will result in the advanced meter's internal valve automatically closing.

2.2 For a suspected leak downstream of the meter, please explain what obligations or requirements FEI currently has to a) alert the customer or other entities and b) to investigate the suspected leak.

Response:

As per the UCA, FEI is obligated to provide service that is adequate, safe, efficient, just and reasonable. FEI is committed to providing the safe and reliable delivery of natural gas to its customers.

Currently, FEI does not have the technological capability to automatically detect leaks downstream of a customer's meter. Consequently, today, when FEI is made aware of a possible gas leak downstream of a meter, typically in the form of a gas odour call, FEI dispatches a field employee to the customer's premises to perform a leak investigation. If the field employee determines there is a leak downstream of the meter the employee will either:

- turn off the customer's gas supply, and inform them that the leak is an immediate safety issue and that the defective appliance or piping must be repaired by a qualified gas contractor, and that FEI will inform the appropriate regulatory authority; or
- if the leak is not an immediate safety issue, the field employee will leave the gas on but will inform the customer they need to arrange for a gas contractor to complete the necessary repair(s) to their appliance or piping.

In both scenarios listed above, if the field employee determines there is a leak downstream of the meter, FEI will inform the customer and take the steps outlined above to ensure the situation is safe before leaving the premises.

2.2.1 Please discuss how these obligations or requirements would change with the deployment of the automatic shut-off capability

Response:

FEI does not believe the automatic shutoff capability will fundamentally change FEI's obligation to provide safe and reliable delivery of natural gas. Rather, the automatic shutoff capability will provide FEI with a new tool to enhance FEI's public safety efforts. With the advanced meter's automatic shutoff capability, FEI will be automatically notified when the meter's internal valve closes because of an unexpectedly high flowrate. When this notification is received, FEI will attempt to contact the customer to determine why the meter detected a high flow rate. If required, FEI will also dispatch a field employee to investigate the source of the high flow rate.

Please also refer to the response to BCUC IR1 2.2 for an explanation of the steps FEI employees currently take, and will continue to take in the future, as a result of leaks that are identified downstream of the meter.

2.3 Please explain what is meant by 'large leaks' mentioned in the preamble.

Response:

'Large leaks' are defined as flowrates that exceed the advanced meter's automatic shutoff threshold. In comparison, 'small leaks' would have a flowrate less than the advanced meter's automatic threshold capacity. To detect possible 'small leaks', FEI will use data analytics to analyze a customer's hourly consumption information collected via the AMI network.

Please also refer to the response to BCUC IR1 2.4 for additional information regarding the process of how FEI will determine the advanced meter's automatic threshold.

2.3.1 Please explain how FEI differentiates large leaks from small leaks.

Response:

Please refer to the response to BCUC IR1 2.3.

2.3.2 Please categorize the reasons for these large gas leaks downstream of the meter.

Response:

Large leaks downstream of the meter can generally be placed into three categories:

1. Someone in the home damages a customer's gas houseline, generally as a result of construction or theft;
2. A fire unrelated to the gas service in the home damages a section of a customer's gas houseline; or
3. A natural disaster (e.g., seismic event, landslide, etc.) breaks a section of a customer's gas houseline.

2.3.3 How frequently (per annum) do large gas leaks occur downstream of the meter in FEI's service territory?

Response:

FEI does not specifically track the number of 'large leaks' that occur downstream of its meters. However, FEI does track the number of leaks (both large and small) that FEI has identified. The table below provides the number of leaks for recent years:

Gas Leaks Downstream of Meter			
Year	2019	2020	2021*
Total	2,989	3,109	3,404
** as of Aug 31, 2021*			

FEI responds to gas emergencies that occur downstream of its meters, which are the result of fires or faulty customer appliances. The number of annual gas emergencies that fall into these categories is provided below:

Fires and Customer Safety Incidents			
Year	2019	2020	2021*
Total	639	588	420
** as of Aug 31, 2021*			

2.4 Please explain how FEI will determine the advanced meter's automatic shut off threshold for each customer, including the methodology and assumptions made.

Response:

The automatic shutoff threshold is configurable by FEI at the customer's meter at the time of commissioning and by FEI through the network. The automatic shutoff thresholds will be developed during the Define Phase of Project implementation (as described in Section 5.5.1.2 of the Application) and FEI will build out enhanced analytic capabilities as the system is deployed and information is collected.

2.5 Please elaborate on how FEI would investigate an automatic meter shutoff alert.

Response:

Please refer to the response to BCUC IR1 2.2.1.

2.6 Please explain whether additional resources will be needed to manage alerts and investigate potential gas leaks downstream of the meter.

2.6.1 Please explain FEI's methodology for determining the additional resources needed, detailing the assumptions made.

Response:

AMI will result in certain new activities for FEI employees; however, these new activities are offset by the efficiencies the technology will create within the groups that are managing the alerts and investigating potential gas leaks downstream of the meter. FEI expects the net result to be that no additional resources will be required to manage this work.

2.7 Please explain the circumstances in which customers could safely remain in their homes in the event of an automatic shut off closing the internal valve.

Response:

FEI expects that the circumstances in which a customer could safely remain in the home (following an automatic shutoff by the meter internal valve), would pertain to situations where the customer has full knowledge of what has caused the automatic shutoff, followed by any required precautionary activities to ensure the gas is fully isolated and the situation is safe. However, specific circumstances that will result in a customer remaining in the home will be determined during the Define phase of Project implementation (as described in Section 5.5.1.2 of the Application).

2.8 Please explain the priority or weighting given to customer safety in determining the need for the AMI Project.

Response:

FEI has not prioritized or applied a weighting to the customer safety benefits provided by the AMI Project because FEI believes all the benefits provided by the AMI Project are important.

3.0 Reference: PROJECT NEED

Exhibit B-1, Section 4.3.2.4.6, p. 61

Customer Safety

On page 61 of the Application, FEI states:

> AMI would also enable FEI to detect smaller leaks and unexpected consumption downstream of the gas meter in the customer's house gas lines and below the flow rate of the AMI automatic shut off threshold. In these situations, hourly, high resolution data consumption from the advanced meters could be used to generate timely exception reports that alert FEI to unexpected flows over a given threshold. FEI would have the ability to contact the customer to determine if the identified constant flow is valid. By taking a proactive approach to these flow anomalies, FEI expects to help customers identify leaks in their house lines or appliances that have unintended gas flow.

3.1 Please explain, with rationale, whether FEI intends to offer this service to all customers.

Response:

FEI expects to offer this capability to all customers connected to the AMI network. Customers not connected to the AMI network will not have access to this capability, as FEI will not have the hourly consumption information required to analyze for possible leaks and other flow anomalies.

3.1.1 Please discuss what obligations or requirements FEI would have to contact the customer regarding unexpected flow and to investigate leaks.

Response:

FEI is obligated to provide reliable and safe delivery of natural gas to its customers and service that is adequate, safe, efficient, just and reasonable. FEI believes that leak detection data analytics will not change these obligations or requirements and that data analytics will provide FEI will an additional tool to enhance FEI's public safety efforts.

3.2 Please describe how FEI would determine the gas flow rate threshold to generate an exception report.

Response:

FEI will determine the gas flowrate threshold and time period of unexpected flows to generate an exception report, and the criteria and timing for contacting the customer after exception report generation during the Define phase of Project implementation (as described in Section 5.5.1.2 of the Application).

3.2.1 Please explain over what time period unexpected flows would need to occur to generate an exception report.

Response:

Please refer to the response to BCUC IR1 3.2.

3.3 Please discuss what criteria FEI would use to determine whether to contact the customer.

Response:

Please refer to the response to BCUC IR1 3.2.

3.3.1 Please discuss the anticipated timing from exception report generation to customer contact and how FEI would contact the customer.

Response:

Please refer to the response to BCUC IR1 3.2.

3.4 Please compare the leak rates and anticipated time to alert a customer using AMI to the customer's ability to detect a gas leak in their house by odour.

Response:

FEI does not track the time it takes a customer to detect a gas leak in their house, nor would this information be either readily available or necessarily available at all; consequently, FEI is unable to conduct the requested comparison.

However, FEI believes that while AMI may not detect every leak before a customer would, there will be important instances when AMI will detect leaks or unexpected consumption before they are detected by a customer. Some examples include:

- Leaks occurring inside a home when the residents are away for an extended period of time or when the home is otherwise unoccupied;
- Underground leaks on customer houselines which could migrate into the customer's premises;
- Appliances, such as a barbecue, mistakenly left on by the customer; and
- A faulty appliance firing continuously, which the customer may not discover until a large bill arrives the following month.

Data analytics will have the ability to detect leaks or unexpected gas consumption in the above scenarios more quickly than a customer, or the public, and this will be an important safety enhancement provided by AMI.

3.5 Please explain whether additional operational capacity is needed to monitor, detect and respond to potential gas leaks and unexpected consumption downstream of the meter.

3.5.1 Please explain FEI's methodology for determining the additional operational capacity needed, detailing all assumptions made.

Response:

Please refer to the responses to BCUC IR1 2.6.

4.0 Reference: PROJECT NEED

Exhibit B-1, Section 3.1.1.2, p. 18

Meter Testing and Exchanges

On page 18 of the Application, FEI states the meter testing and exchange process impacts an average of 60,000 FEI customers per year.

Further on page 18 FEI states:

> The complete replacement of the meter fleet for residential and most commercial customers to support Automation will mean that the meter testing and exchange process will not thereafter be required for residential and most commercial customers for several years.

4.1 Please explain whether FEI studied the extent to which meter replacement impacts its customers.

4.1.1 If confirmed, please describe the studies, and provide the results of these studies.

4.1.2 If not, please explain why not.

Response:

FEI tracks customer feedback about meter exchanges through its customer satisfaction surveys for both field and contact centre interactions. In these surveys, satisfaction ratings apply to the interaction with the employee; they do not specifically reflect the impact to customers of meter exchanges.

While FEI has not specifically studied the extent to which meter replacement impacts customers, FEI believes it is reasonable to conclude that meter exchanges impact customers in such a way that delaying or avoiding these meter testing and exchange processes in future will be viewed positively. This belief is based on the following:

1. A meter exchange requires an adult present at the premises for a four hour window to facilitate the appointment. For some customers, this may require taking time off work which can result in loss of pay. Other customers may simply find it inconvenient to need to be at home for that window of time;

2. A meter exchange involves having to allow an unfamiliar technician into a customer's home twice: once at the beginning of the appointment to confirm any appliances needing relighting, and once at the end to check appliances and relight pilot lights;

3. The potential inconvenience of having the first appointment cancelled by FEI without notice due to an unrelated gas emergency that technicians need to attend, thereby having to make a second appointment; and/or

4. Where a meter is exchanged without the customer being at the premises, the customer will have no gas service (for cooking or heat, for example) until the gas meter is turned back on and appliance(s) are relit.

4.2 Please explain whether AMI meter exchanges will be required by Measurement Canada.

4.2.1 If yes, please provide the number of required AMI meter exchanges each year for the next 20 years following initial installation.

Response:

As a part of the Measurement Canada (MC) sampling plan, the AMI fleet will not be due for inspection until ten years post installation. Consistent with current practice, FEI will select a representative sample from the meter population in year nine as per MC specification S-S-06 *Sampling Plans for the Inspection of Isolated Lots of Meters in Service*. MC sampling will be conducted over a three-year period from 2031 to 2033 at 3,000 meters per year, and once again for a three-year period from 2038 to 2040, at 3,000 meters per year as described in Confidential Appendix G, Schedule 11.

FEI will conduct small internal sample plans of up to 500 meters per year, to monitor the performance of the meter fleet for internal information purposes and to aid in planning for the larger MC sampling.

5.0 Reference: PROJECT NEED

Exhibit B-1, Section 3.1, pp. 20–26

Customer Perception of Manual Meter Reading Process

On page 20 of the Application, FEI states: "From a customer's perspective, the meter reading process requires an unfamiliar third party (the meter reader) to access their property on a monthly basis."

5.1 Please explain whether FEI studied the extent to which its customers are dissatisfied with meter readers accessing their property to perform manual meter reads.

5.1.1 If confirmed, please describe the studies, and provide the results of these studies.

5.1.2 If not, please explain why not.

Response:

FEI has not conducted a study specifically addressing the extent to which its customers are dissatisfied with meter readers accessing their property to perform manual meter reads. However, satisfaction with meter exchanges is a category in FEI's customer satisfaction surveys conducted by SQM Group.

FEI has not conducted such a study because, in general, FEI's customer feedback and research approach is meant to identify overall trends and general levels of satisfaction. FEI typically does not isolate aspects of service for additional research unless the general research indicates there is an opportunity or if FEI has identified a particular process for improvement.

In relation to this specific topic, due to the safety and compliance requirements associated with meter exchanges, there are limited aspects of the process that could be altered, or where specific feedback would support improvements that could not otherwise be identified by the general research.

FEI does have other information that suggests for some customers having unfamiliar third parties access their property regularly is a concern, including comments that customers make during the course of other phone calls with FEI, and the access requirements that some customers ask FEI to comply with during meter reads (i.e., calling the customer first).

On pages 25–26 of the Application, FEI compares and contrasts customer complaints related to manual meter reading received by FEI with the customer complaints received by FortisBC Inc. (FBC).

5.2 Please confirm, or otherwise explain, whether FEI intends to track and evaluate customer complaints related to meter reading following implementation of AMI, if approved.

Response:

Confirmed, FEI will continue to listen to, track, and endeavour to resolve customer complaints related to meter reading following implementation of the Project. This will be the case whether the complaint relates to manual meter reading, or an automated read. Providing customers with a positive experience is a core value for FEI.

6.0 Reference: PROJECT NEED

Exhibit B-1, Section 3.4.1, p. 36

Customer Energy Savings

On page 36 of the Application, FEI states:

> Automation also provides support for achieving energy conservation targets and objectives, ultimately creating potential for customer empowerment. That is, access to detailed energy information better enables customers to make informed energy choices, empowering them to participate in programs and seek options and, as a result, providing the opportunity to participate more fully in their energy choices now and in the future.

6.1 Please explain whether FEI studied the potential increase in customer participation in customer energy savings programs because of AMI.

6.1.1 If confirmed, please describe the studies, and provide the results of these studies.

6.1.2 If not, please explain why not.

Response:

FEI engaged E Source (a utility industry research company) to scan the North American utility industry for the impact that AMI has had on demand side management (DSM) programs. The conclusion of this secondary research was that AMI provides utilities and end-users with more granular energy use data to affect their decisions related to energy efficiency and demand response projects or behaviours. While the research did not uncover direct evidence that AMI generates energy savings impacts in its own right, it did indicate that AMI enables and supports DSM programs across commercial, industrial and residential sectors. AMI has been used at other utilities to enhance standard DSM programs such as home energy reports, energy audits, and retro-commissioning and building-optimization type programs.

6.2 Please describe any studies in Canada, or elsewhere, to determine the impact AMI has on natural gas consumption and provide the results of these studies.

Response:

FEI is not aware of any studies that determine the impact AMI has on natural gas consumption. For further context, please refer to the response to BCUC IR1 6.1.

7.0 Reference: PROJECT NEED

Exhibit B-1, Section 3.4.1, p. 36

Customer Expectations

On page 36 of the Application, FEI states: "in a recent poll of FortisBC's MyVoice panel, approximately 75 percent of respondents rated having comprehensive online information about home energy use as 'very important.'"

Footnote 42 on page 36 of the Application states:

> The MyVoice panel represents customers that are willing to participate in surveys and provide their feedback on various subjects from time to time. Results help inform and provide an indication of customer attitudes but are not considered statistically representative.

7.1 Please explain whether FEI conducted any statistically representative surveys of customer attitudes on having more detailed natural gas use information.

7.1.1 If not, please explain why not.

7.1.2 If yes, please describe any surveys FEI conducted and provide the results of these surveys.

Response:

Yes, FEI conducted a customer survey in 2019 to understand the perceived benefits and drawbacks of a gas AMI system. The survey asked participating customers two specific questions regarding how useful it would be to have consumption information.

Survey results showed that 65 percent of residential customers and 60 percent of small commercial customers responded that the "Ability to access more accurate, daily updates to better understand and manage your gas use" was a "Very" or "Somewhat Useful" advanced meter feature. In addition, 64 percent of residential customers and 56 percent of small commercial customers responded that the "Ability to access more accurate, daily updates to inspire more mindful choices such as upgrading to higher efficiency appliances" was a "Very" or "Somewhat Useful" advanced meter feature.

A summary of the survey results was included with the Application as Appendix H-5 - Advanced Gas Meters Research Summary.

A total of 507 surveys were completed with residential customers (+/- 4%)[2] and 222 surveys were completed with small commercial customers (+/- 7%).

[2] Percentages refer to the margins of error associated with each sample size at the 95 percent confidence level.

8.0 Reference: PROJECT NEED

Exhibit B-1, Section 3.4.2, pp. 41–42

Customer Benefits and Operational Opportunities

On pages 41–42 of the Application, in Table 3-1, FEI lists several benefits of the AMI Project.

8.1 Please explain whether any of these potential project benefits will require further investment by FEI.

Response:

FEI assumes that the preamble reference was intending to refer to Table 3-11. Realizing future DSM opportunities and enhanced billing options would require further investment by FEI. Benefits would be realized after a business case was identified and a project undertaken to deliver the proposed functionality. The remaining benefits listed in the table are expected to be delivered by and during the proposed AMI Project.

8.2 Please provide a timeline of when these benefits will be realised, if they are not achieved upon AMI Project completion.

Response:

Please refer to the response to BCUC IR1 8.1.

8.3 Please explain how the realization of these benefits will be measured.

Response:

All of the benefits listed in Table 3-11, with the exception of leak detection and the reduction in GHG emissions, are enhancements to FEI capabilities that are not easily quantifiable or measureable. FEI considers that these benefits can be qualitatively observed to either be available or not.

In the case of leak detection, the capabilities can be measured by tracking the number of potential leaks that have been identified, and following up with customers to confirm whether a leak was actually present or not.

1 GHG reduction benefits can be measured by determining the number of vehicles and kilometres
2 driven that are no longer required after AMI. This will be an estimate as it may sometimes be
3 difficult to determine if a trip is needed or not needed exclusively as a result of the AMI Project.

4

B. PROJECT ALTERNATIVES

9.0 Reference: PROJECT ALTERNATIVES

Exhibit B-1, Section 4.3, pp. 55–56

AMI Alternative

On page 55 of the Application FEI states:

> FEI's AMI alternative would include the installation of two-way network infrastructure to support wireless delivery of data between both the advanced meters and other field devices and FEI's existing enterprise information systems. Each advanced meter includes a shut-off valve to support remote control of the gas flow to each customer meter.

On page 56 of the Application, FEI states that with AMI an estimated 1.5 percent of the meter reads would still need to be collected manually in areas where it is not economically feasible to install a fixed network.

9.1 Please explain why it would not be economically feasible to install a fixed network in certain areas.

Response:

There are capital and ongoing operating costs to install and maintain a base station, and therefore in some locations where terrain or obstructions may severely impede the signal level and customer density is low, it may not be cost-effective to install a fixed network. Therefore, in certain instances collecting the measurement data from the AMI meter configured in AMR mode is the best option as discussed in the response to BCUC IR1 9.3.2.

A fixed network requires base station infrastructure to be installed in an area to provide wireless coverage. The wireless coverage attainable from a base station depends on its installed location, and the environment between it and potential field devices. In general, the Sensus FlexNet fixed network technology is a near line of site technology, meaning that while a clear line of site between a meter and the base station is not required, certain obstructions cannot be overcome by the technology. Signal levels are particularly susceptible to terrain obstructions (hills/mountains) and therefore can be severely impacted in mountainous environments. FEI must consider the initial and ongoing costs of a fixed network against the avoided ongoing costs of manual or drive-by meter reading.

9.2 Please explain FEI's methodology for identifying which areas it would not be economically feasible to install a fixed network, detailing the criteria used and all assumptions made.

Response:

As part of the Define Phase of Project implementation (as described in Section 5.5.1.2 of the Application), the network vendor will provide a final design that meets the coverage requirements and identify those areas or meters that will likely be outside of a base station coverage area.

FEI has included a coverage requirement in the contract with the selected network vendor, as discussed in the response to BCUC IR1 23.1. The coverage requirement was negotiated using knowledge from past projects to help determine what percentage of customer meter coverage should be required.

9.3 Please provide the number of areas and the number of meters in each area where a fixed network would not be economically feasible. Please provide a map(s) showing each area.

Response:

Please refer to the response to BCUC IR1 9.2.

9.3.1 Please explain whether FEI considered any project alternatives other than manual meter reading for these customers.

Response:

For the residual meter reads that are not collected using the fixed network infrastructure, FEI plans to use a combination of AMR and manual meter reading. FEI is not aware of any other practical and reliable methods for collecting meter readings on a routine basis.

9.3.2 Please explain whether these customers could have meter reads under an Automated Meter Reading (AMR) project technology alternative.

9.3.2.1 If yes, please provide a high-level cost estimate of implementing an AMR solution for these customers.

Response:

The meters to be used for the proposed AMI Project are also capable of operating in an AMR mode. The Project as proposed in the Application already includes costs to enable FEI to read these uncovered meters in AMR mode as discussed in Section 4.3.3.1 of the Application.

9.4 Please provide the total cost to install a fixed network in all areas where a fixed network was determined to not be economically feasible.

Response:

Please refer to the response to BCUC IR1 9.2.

9.5 Please explain whether there are any benefits of the AMI Project for the customers in areas without a fixed network, including whether FEI will have the ability to remotely control the gas flow to each customer meter in these areas.

Response:

In areas without a fixed network, customers will still receive the following benefits from the AMI Project due to the AMR capabilities inherent in the advanced meters:

- No need to physically access customer property for meter readings (assuming the AMR signal is available at the roadside);
- Reduced billing errors due to no requirement to manually collect and enter meter read; and
- Detection and automatic service shutoff when a potential safety issue is detected by the meter.

Remote control of the flow of gas to customers outside the fixed network service area is not a capability of the system; however, the capability to remotely shut off (but not remotely turn on) gas service from a short distance away from the meter (e.g., the roadside at less than 30 metres from the meter) will be possible.

10.0 Reference: PROJECT ALTERNATIVES

Exhibit B-1, Section 4.3, p. 56

AMI Alternative

On page 56 of the Application, FEI states that an estimated 2 percent of meter reads would still need be collected manually to accommodate customers that choose to have their advanced meter read manually.

10.1 Please describe the reasons why customers may choose to have their advanced meter read manually.

Response:

There are a variety of reasons that FEI customers may choose to have their advanced meter read manually. The primary reason is expected to be for certain customers that may have health-related concerns associated with radio frequency emissions from the AMI meters.

10.2 Please explain FEI's methodology for estimating the number of customers that choose to have their advanced meter read manually, detailing all assumptions made.

Response:

FEI used a conservative approach in estimating the number of customers that may elect to have their meter read manually. The projected two percent is based on the experience of both FBC and BC Hydro during the deployment and operation of their respective advanced meter programs. FEI notes that it has not included the cost of manually reading meters for opt-out customers in the AMI financial model. FEI has assumed the customers who elect to have their meter read manually will be responsible for the costs associated with the manual collection of their meter reads (the revenues will offset the costs).

10.3 Please explain whether FEI will have the ability to remotely control the gas flow to customers that choose to have their advanced meter read manually.

Response:

FEI will not be able to remotely close the advanced meter's internal valve at customer premises that elect to have their meter read manually. The reason for this is the radio transceiver will be

turned off in these advanced meters; therefore, closing the advanced meter's internal valve will require a field employee to visit the customer's premises.

10.4 Please explain whether FEI explored any alternatives to manual meter reading for these customers. If yes, please provide an analysis of the alternatives and a high-level cost estimate.

Response:

FEI has identified three meter-reading methods:

- Manual;
- AMR (drive-by); and
- AMI (fixed network).

Consequently, manual meter reading is the only available meter reading method for the projected 2 percent of customers who do not want RF communication enabled on their meter.

11.0 Reference: PROJECT ALTERNATIVES

Exhibit B-1, Section 4.2.1, p. 45

AMR Alternative

On page 45 of the Application, FEI states:

> AMR is a system in which customer meter reads are retrieved using an automatic means most commonly by driving by with a vehicle, although it can also entail fly-by with an airplane or in some cases walk-by with a handheld device.

Further on page 45, FEI states that for the AMR alternative, it investigated a drive-by solution.

11.1 Please discuss whether there are other methods available to retrieve meter reads automatically, which are not mentioned in the preamble, including any new and emerging technologies.

Response:

FEI is not aware of any other existing, new, or emerging technologies that would retrieve meter reads automatically from a meter installed at a customer's premises.

11.2 Please explain whether FEI only investigated a drive-by AMR solution.

11.2.1 If yes, please explain why.

11.2.2 If no, please explain whether FEI assessed the feasibility of other methods to retrieve meter reads automatically.

11.2.2.1 If confirmed, please describe the assessments to determine the feasibility of the various meter read retrieval methods and provide the results of the assessments.

11.2.2.2 If not, please explain why not.

Response:

As an alternative to the proposed AMI Project, FEI only considered a drive-by AMR solution.

FEI did not consider alternative approaches to AMR because, after evaluation, it was determined AMR does not address the Project drivers. Consequently, FEI limited the AMR review to development of an AACE Class 4 estimate for use in the economic comparison (as required by

1 the BCUC's CPCN Guidelines[3] for project alternatives) and did not review any additional data
2 collection methods other than the industry standard drive-by option that was proposed by the
3 AMR RFP proponents.

4

[3] Appendix A to Order G-20-15.

C. PROJECT DESCRIPTION

12.0 Reference: PROJECT DESCRIPTION

FEI 2019-2022 Gas Supply Mitigation Incentive Program Proceeding, Exhibit B-1, p. 6 [4]

Order G-232-19 dated September 26, 2019

Project Benefits and Incentives

As approved by BCUC Order G-232-19, the Gas Supply Mitigation Incentive Program (GSMIP) structure is described on page 6 of Exhibit B-1 in the FEI 2019-2022 GSMIP Application Proceeding as follows:

> The current GSMIP measures the performance of mitigation efforts in order to determine the appropriate incentive earned by the Company… All activities included in the GSMIP are based on mitigation of the gas portfolio resources held by FEI pursuant to its ACP, which in turn is reviewed and accepted by the BCUC. These activities have been separated into four categories: benchmarked activities, non-benchmarked activities, storage and forward commodity sales, and new activities.

FEI provides Table 1 showing the percentages returned to FEI's shareholder under the GSMIP, with the balance of the savings to the ratepayer:

Table 1: Incentive Percentage Structure

	Activity	Incentive Percentage
1	**Benchmarked Activity**	
	Market Performance Factor (MPF) between 100% - 131%	2.45% + 0.05% * (MPF – 100)
	MPF between 131% - 136%	4.00%
	MPF of 136% and greater	4.00% + 0.04% * (MPF – 136)
2	**Non-Benchmarked Activity**	4.00%
3	**New Activity**	12.00%

12.1 Please explain whether the AMI Project would allow FEI to manage its gas supply to increase the incentive payable under the GSMIP.

Response:

FEI does not expect the AMI Project will provide increased incentive payable under the GSMIP.

FEI's gas supply and mitigation strategies are based on balancing the total volume of supply and demand at its interconnections with the Westcoast T-South and TC Energy FoothillsBC pipeline systems. The daily demand forecast is based on Environment Canada weather forecasts, which

[4] https://www.bcuc.com/Documents/Proceedings/2019/DOC_54702_B-1-FEI-2019-2022-GSMIP-Application.pdf.

are then used as an input into a model to produce a total gas demand forecast by region (i.e., Interior, Lower Mainland, and Vancouver Island) over a 24-hour period. The additional customer load granularity provided by AMI is not expected to materially improve this process.

12.2 Please explain whether there are any other benefits to FEI's shareholder from implementing the AMI Project.

Response:

The only direct benefit of the AMI Project to FEI's shareholder will be in those years where the rate base investment is higher than it would have been without the Project; in those years of higher rate base investment, the allowed return to FEI's shareholder for financing this investment in rate base will also be higher. Overall, the Project will provide an enhanced level of service to FEI's customers, which increases customer satisfaction and hence the overall sustainability of the business which is of long-term benefit to FEI's shareholder, FEI's customers, and the general public.

13.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.3, pp. 70–73

Project Development Activities

On pages 71–72 of the Application, FEI discusses learnings from the 2014 FBC AMI project.

13.1 At a high level, please discuss the scope of FBC's AMI project as compared to FEI's proposed AMI Project. Please highlight the differences and similarities between the two projects, including but not limited to the functionality of the meters selected, associated meter communication devices, the network architecture, and the implementation processes. In the response, please explain why similar or different approaches were used for the two projects.

Response:

At a high level, FBC's AMI project is very similar to the proposed FEI AMI Project. Most of the differences between the projects are directly attributable to the differences between the gas and electric commodities and systems. While some differences relate to the significantly different scale of the installations, there have been opportunities to incorporate strategies and tactics that proved successful within the FBC electric AMI project into FEI's AMI Project plan.

Similarities between the gas AMI and electric AMI projects include:

- Wholesale change from legacy metering technology to digital metering technology;
- Enables customers to have access to more information of higher quality;
- Incorporates capabilities to remotely disconnect/reconnect service; and
- Company owned network technology.

Differences between gas AMI when compared to electric AMI include:

- Scale of project (approximately 1 million gas versus 130 thousand electric customers);
- Gas theft detection and deterrence are less of a driver when compared to electric AMI;
- Meter replacement appointments are required for majority of gas customers;
- Wireless network uses licensed point-to-point technology instead of unlicensed mesh technology;
- Software as a Service (SaaS) and Managed Services model for ongoing application support;
- Provides significant system resiliency benefits through the ability to curtail customer load.

Two notable system differences listed above relate to the wireless network technology being used, and the support model for the hardware and software.

As discussed in the response to BCUC IR1 14.4, FEI did not choose the network technology independent from the remaining technology; rather, it was chosen as part of the overall technology decision. However, it is still useful to point out the importance of the network technology on power consumption, as the meters used in a gas system are not connected to a continuous power source like electric meters. The Sensus FlexNet protocols were designed with battery operation in mind and are engineered to minimize power consumption and maximize battery life.

Please also refer to the response to BCUC IR1 15.1 for a discussion of why FEI decided to use the SaaS model.

On pages 72–73 of the Application, FEI discusses FEI's natural gas pilot project (Pilot).

13.2 At a high level, please discuss the scope of FEI's Pilot as compared to the full scope of FEI's proposed AMI Project. Please highlight the differences and similarities between the two projects, including but not limited to, meters selected, the associated meter communication devices, and the network architecture. In the response, please explain the reasons for any differences.

Response:

The primary difference between FEI's AMI Pilot and the proposed AMI Project was the use of diaphragm meters together with an AMI metering and communications module for the Pilot as compared to the planned digital ultrasonic meters that will comprise the majority of FEI's meter deployments for the Project.[5] This difference was due to the Sensus Sonix IQ solid-state meters being not yet accredited for use in Canada at the time of the Pilot in 2017/18.

In addition to the diaphragm meters, the communications network used in the Pilot was of an older generation than what will be installed as part of the proposed AMI Project, as discussed in the response to BCUC IR1 13.3. The security and speed improvements of the current generation communications network are built upon the existing technology used in the Pilot. For the purposes of network feasibility evaluation, these communication network technologies are effectively the same.

[5] In some instances, diaphragm meters with AMI communication modules may be used where required.

On page 72 of the Application, FEI states:

> The objectives of the Pilot were to assess:
>
> 1. The ease of installation of the network technology, AMI advanced meters and meter communication modules;
> 2. The effectiveness and reliability of the network technology;
> 3. Data collection performance;
> 4. Operational business process impacts; and
> 5. Areas of expected benefits.

13.3 Please discuss whether cybersecurity was implemented and tested during the Pilot, including whether FEI confirmed that data transmitted between meters, network infrastructure, head end and internal systems was protected from intrusion or acquisition by external parties.

13.3.1 If yes, please provide a detailed description of the outcome and how this has informed the AMI Project.

13.3.2 If specific cybersecurity testing and validation was not undertaken during the Pilot, please explain why not and how FEI will secure this information from intrusion or acquisition by external parties when the proposed AMI Project is implemented.

Response:

Network and wireless cybersecurity mechanisms were not tested by FEI during the Pilot. FEI plans to use the latest version of the Sensus FlexNet network technology (version 2) that was not available at the time the Pilot evaluation took place. This solution includes built-in security mechanisms. FEI determined that detailed technical testing of technology of a previous generation to that proposed for the AMI Project would not yield useful results. Cybersecurity testing will be completed as part of the AMI Project and will be completed prior to the system being placed in production. Please also refer to the response to BCUC IR1 19.1.

13.4 Please discuss whether radiofrequency exposure levels were evaluated during the Pilot.

13.4.1 If yes, please provide a detailed description of the evaluation, comparison to Health Canada limits, and how this has informed the AMI Project.

13.4.2 If not, please explain why not.

Response:

Radio frequency exposure levels were not evaluated during the FEI AMI Pilot for the reasons discussed in the response to BCUC IR1 13.3. Furthermore, due to the extremely low duty cycle associated with the FlexNet wireless technology (i.e., extremely short transmission durations spaced several hours apart), it is not practical to accurately measure the exposure. However, FEI will undertake emissions testing during the Project testing phase to verify the manufacturer's claimed duty cycle and power output level.

13.5 Please summarize any feedback received from Pilot program customers.

Response:

FEI did not solicit feedback from customers during the Pilot as the primary objectives of the Pilot were to assess the technical feasibility of the proposed solution and to inform the potential Project benefits and business impacts.

On page 73 of the Application, FEI states the following with regards to outcomes of its Pilot: "Detection of gas theft by comparing the amount of gas delivered to the distribution system against measured gas consumption in neighbourhoods was not feasible."

13.6 Please expand on why and how this method for detecting gas theft was determined not feasible.

Response:

As part of the Pilot, FEI explored the feasibility of using upstream metering for detecting unaccounted-for-gas based on a reconciliation with downstream AMI meter readings. This approach is conceptually similar to the approach employed by some electric utilities for detecting losses ("energy-balancing"); however, due to technical complexities and the associated costs of installing the required upstream metering, FEI deemed this approach to be not feasible.

For electric distribution facilities, relatively low-cost clamp-on current meters can be used to conduct energy-balancing investigations for identifying losses, with these meters periodically relocated to segment downstream customers into smaller groupings to assist in confirming the source of any losses. The deployment and iterative redeployment of these clamp-on meters is relatively straightforward, requiring only one qualified resource to install, with installation often completed in minutes. As a result, the overall costs associated with the purchase and deployment of these upstream meters is low.

In contrast, the costs associated with the purchase and installation of upstream metering for gas distribution facilities are significantly higher. This is primarily due to the underground nature of gas distribution systems and the significant work that can be required to isolate portions of the system in which metering is to be installed. Given these conditions, the areas identified as feasible for the purposes of the Pilot were limited to existing looped areas of the distribution system where the installation of in-line metering could be cost-effectively completed (i.e. minimal traffic control required, no asphalt removal/replacement, easy access for excavation and meter pit install, etc.). This resulted in segmented sections ranging from approximately 30 to 70 customers. FEI notes that it did not identify significant losses indicative of theft in these segments. Based on the results of the Pilot, FEI determined that this approach to theft detection was unlikely to provide a net benefit as related to the proposed Project.

13.7 Please discuss how this determination regarding the detection of gas theft informed the AMI Project.

Response:

As a result of determining that gas theft detection by comparing the amount of gas delivered to the distribution system against measured gas consumption in neighbourhoods (as referenced in the preamble to this question) was not feasible as part of the AMI Project, the Project team ceased exploring the quantification of potential theft detection benefits and instead focused on the expected customer and operational benefits from the Project. Despite this, FEI still does expect Project benefits associated with theft detection through the AMI-enabled meter tamper and event alarms, as well as access to more granular, time-stamped consumption data.

13.8 Please discuss how FEI determined the estimated benefits from gas theft detection loss prevention for the AMI Project.

Response:

FEI has not included any estimated financial benefit from potential reductions of gas theft in the Project cost estimate due to the uncertainty of any future financial benefits from AMI-enabled theft detection. Any financial benefits associated with reductions in gas theft would serve to further minimize the estimated rate impact of the Project.

On page 70 of the Application, FEI describes the AMI Project scope, which includes the capability to "[d]etect and deter gas theft."

13.9 Please explain how the AMI Project will detect and deter gas theft.

Response:

Please refer to the response to BCUC IR1 13.7.

13.9.1 Please discuss whether any incremental revenues associated with the potential reduction of gas theft have been incorporated into the AMI Project cost estimate.

Response:

Please refer to the response to BCUC IR1 13.8 for details of FEI's inability to quantify the financial benefits related to the potential reduction of gas theft associated with the Project.

On page 73 of the Application, FEI states the following regarding outcomes of its Pilot: "The current meter exchange methodology of calling customers to book an appointment for a technician site visit, will provide an additional customer communication channel during meter deployment."

13.10 Please discuss the other communications channels that FEI intends to use during the meter deployment and the anticipated primary audience of each channel.

Response:

FEI customers are the primary target audience for all external communications related to the Project. To support meter deployment, FEI intends to utilize a variety of communication channels to inform and educate customers about the Project and promote appointment scheduling. Due to the broad scope of the Project, diverse communication channels are necessary to ensure customers remain engaged and informed, and have opportunities to provide feedback throughout deployment.

A multi-channel approach will ensure customers are aware and informed of the Project. Details on consultation, engagement and communication plans for deployment are provided in the response to BCUC IR1 36.2.

Some of these communication channels include:

- Direct customer notifications such as bill inserts, letters/postcards, and door hangers intended to inform customers about the Project, notify of upcoming appointments, or prompt customers to contact FEI;
- Digital outreach including, but not limited to, digital advertising, social media, regular Project website updates, virtual information sessions, FEI Account Online notifications, emails, and FEI Energy Moment newsletters; and
- In-person outreach including information sessions and community events.

FEI is confident that the communication channels described above are sufficient to engage, inform, and offer opportunity for feedback from customers throughout the Project.

13.11 During the appointment booking process for meter exchange, please discuss how much additional time FEI expects to incur to address concerns from customers regarding AMI, compared to its typical meter exchange process.

13.11.1 Please discuss whether this additional time is factored into the AMI Project resourcing, scheduling and budgeting.

13.11.2 Please discuss whether there were any learnings obtained from FBC's AMI project, the Pilot and/or other projects that informed the Project in this regard.

Response:

This question appears to suggest that FEI has determined that its staff will be booking the appointments needed to install the advanced meters; however, FEI has not yet made this determination. FEI's deployment vendor RFP asks invited proponents to provide appointment-setting services, including an on-line, customer self-service tool. In that model, FEI employees will not book meter-exchange appointments for the duration of the Project, but will provide the successful proponent with material to allow them to respond to customer inquiries, and provide information about the Project.

Regardless of whether a third party or FEI books appointments, and based on information gathered during the gas Pilot project, FEI expects that the amount of time on average spent with customers during the AMI appointment booking process will be comparable to that spent during the typical meter exchange process. As such, the costs for appointment booking have been considered using this assumption and are embedded in the forecast Project capital costs as described in Section 6 of the Application.

Further on page 73 of the Application, FEI states the following with respect to key insights gained from the Pilot: "To allocate sufficient time and resources for deployment of meter exchanges and non meter communication modules, installation durations will be derived from FEI experience as confirmed by the Pilot."

13.12 Please provide the installation durations that can be derived from the Pilot and how that compares to those used in the AMI Project.

Response:

The AMI Pilot confirmed a properly trained contractor is capable of completing meter exchanges and the installation of non-meter communication modules in the same range of durations as an experienced FEI field employee.

The time required to exchange a meter, relight a customer's appliance(s), and close out the work order can vary from 30 to 90 minutes. Reasons for this range of durations include:

- Ease of access to the meter set;
- Meter sets that are installed in tight spaces and are challenging to work on;
- Meter sets that are difficult to wrench apart;
- Inclusion of a regulator exchange;
- Inclusion of a bypass valve installation; and
- Number of customer relights.

The durations used in the Application are based on FEI field employee average productivity rates, which the AMI Pilot confirmed can also be attained by a properly trained contractor.

14.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.3.3, pp. 74–76; Exhibit B-2, Attachment 3

Procurement Processes for the Solution

On pages 74–75 of the Application, FEI discusses the Network Vendor Request for Proposals (RFP) process and states:

> The FEI Natural Gas Network Vendor RFP was released in October 2017 and covered the provision of the following:
>
> 1. Meter hardware and functions:
>
> - Automated Meter Reading Devices (AMRD) to be installed on existing diaphragm meters;
> - New diaphragm meters with AMRDs;
> - New advanced meters with embedded AMI radios;
> - Non-meter sensors;
>
> 2. Network hardware and functions:
>
> - Collectors and routers required to build the network;
> - Meter control system (AMI Head End System (HES)) and services;
> - Labour for network installation;
>
> 3. Meter Data Management System (MDMS) and services; and
>
> 4. Other services, including but not limited to, training and security requirements.

14.1 Please discuss FEI's rationale for combining the above noted items in one single RFP. In the response, please discuss whether FEI considered dividing the scope into multiple RFP's and why that was rejected.

Response:

There is currently little interoperability between different vendor solutions for meters, AMR devices, network hardware, and head end systems. This makes it impractical to expect different vendors to respond separately to these requirements. For the network installation, FEI determined that there is significant dependence on the head end system during commissioning and therefore it was practical to include this component in the same scope of work.

While the MDMS and MDMS services were included in the 2017 Natural Gas Network Vendor RFP this did not preclude FEI from choosing to procure this component from another vendor. It was included in the above noted RFP as an option to allow the gathering of information about MDMS capabilities at the same time as the other components.

14.2 Please discuss whether the devices, including meter, network, hardware and software products have maintained their currency, or have changed significantly following the October 2017 RFP.

Response:

The Sensus devices proposed in the 2017 AMI Network RFP have maintained their currency. As reflected in the response to BCUC IR1 13.3, FEI has contracted for the latest iteration of the Sensus FlexNet product, including meter hardware, communications hardware, and security mechanisms when deploying the Project.

14.2.1 Please discuss FEI's ability to make changes to its products under the terms of its contract with Sensus.

Response:

FEI assumes this question refers to whether FEI is obligated to purchase the exact product proposed at the time the technology was selected after completing the RFP. Please refer to the response to BCUC IR1 14.2.

Table 5-1, on pages 74–75 of the Application, describes the "key technical considerations that informed evaluation of Network Vendor RFP proponents/proposals." Table 5-1 is reproduced below:

Table 5-1: Network Vendor RFP Technical Considerations

		Description
Core Product	Meters	Availability of next generation solid state meters with remote disconnect
	Communications	Assessment of network solutions offered
	Meter Data Management	Assessment of meter data management platforms offered
	Warranties	Assessment of warranties offered to mitigate FEI risk

		Description
Market Readiness/ Compliance	Hardware	Assessment of next generation products and timing of market availability
	Measurement Canada	Assurance of Measurement Canada meter approval
	Safety Compliance	Assurance of compliance with Underwriters Laboratories Inc. (UL) Canadian safety certification
Future Proofing	Hardware	Assessment of existing/future hardware version, capability and scalability
	Network	Assessment of network interoperability and alignment with industry standards

On page 75 of the Application, FEI states:

> After evaluation and scoring of each proposal, one vendor's proposed solution was not mature enough for consideration. The top two vendors were invited to provide product demonstrations, after which reference checks were conducted and contract negotiations were initiated.

Attachment 3 of Exhibit B-2 provides further information on the Network Vendor RFP. Page 1 of Attachment 3 of Exhibit B-2 states:

> The proposals that were not rejected (Qualifying Proposals) were evaluated based on predetermined criteria, including proponents' ability to meet requirements, completeness of the proposals, technical capabilities of the systems, experience of the proponents, and pricing.

14.3 Please provide the full list of predetermined criteria used to evaluate the Qualifying Proposals.

Response:

The following table outlines the predetermined criteria used to evaluate the Qualifying Proposals as well as the relative weightings of each category. FEI is filing a portion of this response on a confidential basis pursuant to Section 18 of the BCUC's Rules of Practice and Procedure regarding confidential documents, as set out in Order G-15-19, to preserve commercially sensitive information which, if disclosed, could prejudice or negatively impact the bidding process or FEI's ability to negotiate. The confidential portion has been redacted in the public version.

Criteria	Point Value
Meter and Module Requirements	[redacted]
Network Requirements	[redacted]
MDM Requirements	[redacted]
Other Requirements (company experience, work plans, etc.)	[redacted]
Pricing	[redacted]
Vendor Demonstration	[redacted]
Total Points	[redacted]

14.3.1 Please identify whether these criteria were assigned weightings for use in the evaluation.

14.3.1.1 If yes, please identify the weightings and why FEI considers them reasonable.

14.3.1.2 If not, please discuss why not.

Response:

Please refer to the response to BCUC IR1 14.3 for the assigned weightings used in the evaluation. The weightings were derived from the considerable experience of both FEI and its consultant with similar RFP processes. The weightings are fair, strike a reasonable balance between different aspects of a solution, and consider the entirety of a solution for meeting the project objectives without putting undue weight on any one specific technical or other attribute of the proposal.

As shown in Table 5-1 above, the technical consideration "communications" is described as an "assessment of network solutions offered."

14.4 Please expand on how the assessment of network solutions offered was evaluated. Specifically, please discuss how FEI determined which network solution was the preferred solution.

Response:

FEI did not determine a preferred network solution. As discussed in Confidential Attachment 3 of the Application Supplemental Information (Exhibit B-2-1), which provides a summary of the FEI AMI Network Vendor RFP, FEI evaluated the technical components of the proposed network solution on whether it would meet the requirements, and the difficulty in deploying and maintaining it.

The price of the network solution put forth in the qualifying proposals factored into the overall price component of the RFP and was not explicitly part of the network solution evaluation.

As shown in Table 5-1 above, the technical consideration "meter data management" is described as an "assessment of meter data management platforms offered."

14.5 Please expand on how the assessment of meter data management platforms offered was evaluated. Specifically, please discuss how FEI determined which meter data management platform was the preferred solution.

Response:

FEI did not determine a preferred meter data management platform. As discussed in Confidential Attachment 3 to the Application Supplemental Information (Exhibit B-2-1) which provides a summary of the FEI AMI Network Vendor RFP, FEI evaluated the technical components of the proposed meter data management solutions on whether they would meet the requirements, and the difficulty in deploying and maintaining different vendor solutions. As such, the meter data management platform formed a part of the overall vendor evaluation.

On pages 75–76 of the Application, FEI describes its planned Deployment Vendor RFP. FEI states:

> FEI previously released an AMI Deployment Vendor RFP in October 2017; however, the process was not completed due to, among other things, changes in FEI's service requirements and changes in the deployment vendor marketplace. As consequence, FEI will release a new RFP in Q2 2021 that covers the provision of the following services:
>
> 1. Installation Services:
>
> - Installation of new advanced meters;
> - Installation of by-pass valves at most meter sets;
> - Installation of new regulators at some meter sets; and
> - Installation of new AMI communicating modules on large commercial and industrial meters.
>
> 2. Other Deployment Services:
>
> - Installation services workforce management;
> - Logistics and material management, in support of installation services;
> - Recycling of removed meters and regulators;
> - Management of customer keys/access;
> - Providing operational reporting; and
> - Management of customer escalations.

3. Provision of installation personnel with the training, tools and equipment required to complete their work safely and reliably.

When determining the successful Deployment Vendor in Q4 2021, FEI will consider each proponent's profile and experience, work plan, and ability to deliver the scope of services in accordance with the Deployment Vendor RFP.

14.6 Please describe the "changes in FEI's service requirements and changes in the deployment vendor marketplace" that resulted in not completing the October 2017 Deployment Vendor RFP.

Response:

FEI gained greater knowledge and insight into the AMI Project between 2017 and 2021 that influenced the decision to not complete the Deployment Vendor RFP issued in 2017 and reissue it in 2021 with revised requirements. Some of these revisions include:

- A change in the deployment period from 5 years to 3 years;
- Focusing on AMI installation only, and not a variety of options (e.g., AMR);
- Removing manual meter reading throughout deployment as a requirement;
- Introducing an Alternative Safety Approach that will allow for a ratio of internally trained installers reporting to a licensed gasfitter (instead of requiring all installers to be licensed gasfitters);
- Introduction of a more robust industrial hygiene program; and
- Evaluating the possibility of FEI managing the appointment-setting, rather than appointment-setting by the successful proponent.

Regarding the change that has taken place in the deployment vendor marketplace since 2017, FEI was made aware of the consolidation of two of the potential market participants into one. FEI believed that this change, coupled with changes in its service requirements, warranted further consideration.

With all of these changes since the 2017 Deployment Vendor RFP was issued, FEI elected to reissue the Deployment Vendor RFP to allow potential vendors in the current marketplace the opportunity to provide proposals based on current needs.

14.7 Please confirm, or otherwise explain, whether the Deployment Vendor RFP has been released and the date of release

.

Response:

The Deployment Vendor RFP was released June 18, 2021.

14.8 Please expand on the selection criteria FEI will use to select a Deployment Contractor and explain how the criteria will be weighted. Please include in the response why FEI considers this reasonable.

14.8.1 If not included in the above response, please discuss how FEI intends to evaluate the cost of each proponent's proposal alongside the criteria described in the preamble.

Response:

FEI is filing a portion of this response on a confidential basis pursuant to Section 18 of the BCUC's Rules of Practice and Procedure regarding confidential documents, as set out in Order G-15-19, to preserve commercially sensitive information which, if disclosed, could prejudice or negatively impact the bidding process or FEI's ability to negotiate. The confidential portion has been redacted in the public version.

FEI is currently working through its deployment strategy and notes that under the terms of the Deployment Vendor RFP (as with other RFPs), it has absolute discretion to take a number of actions. These actions include:

- accepting all or part of a proponent's proposal;
- having someone else (regardless of whether they have submitted a proposal under the RFP) carry out all or some of the services in the RFP; or
- carrying out all or some of the services as set out in the RFP, on its own.

This discretion affords FEI the opportunity to ensure it is making the best decision it can as to how to complete the meter deployment in a cost-effective manner that reflects FEI's core values related to safety, quality and customer experience.

As FEI continues to evaluate its deployment strategy, including the selection of an external vendor (or vendors) it may consider selection criteria such as the written proposal, pricing, overall alignment and fit, as well as a demonstration. [redacted]

On page 76 of the Application, FEI states:

> In May 2020, FEI undertook procurement processes to select preferred suppliers of bypass valves, and residential and small commercial regulators.
>
> Bypass Valve and Regulator Suppliers
>
> Negotiations have commenced with the preferred supplier of bypass valves and the preferred regulator supplier. At the date of this submission, negotiations are ongoing with both preferred suppliers. FEI expects to finalize both contracts in Q2 2021.

14.9 Please describe the procurement processes FEI undertook to select the preferred suppliers of bypass valves, and residential and small commercial regulators.

Response:

FEI issued an RFP for the supply of regulators and received bids from a number of proponents. To determine the preferred supplier, FEI evaluated a number of proponent parameters. After this evaluation, FEI selected its preferred regulator supplier and entered into contract negotiations.

FEI issued a separate RFP for the supply of the bypass valves. Similar to the regulator RFP, FEI evaluated a number of parameters. After this evaluation, FEI selected its preferred bypass valve supplier and entered into contract negotiations.

Section 5.3.3 of the Application provides additional information on the bypass valve and small commercial and residential regulator procurement processes.

14.10 Please confirm, or otherwise explain, whether contracts have been finalized with these suppliers.

14.10.1 If yes, please identify the suppliers selected.

Response:

A contract for the supply of small commercial and residential regulators has not been finalized with FEI's preferred supplier. Contract negotiations with FEI's bypass valve preferred supplier are also ongoing.

Both negotiations have been positive and FEI expects to come to an agreement with each vendor.

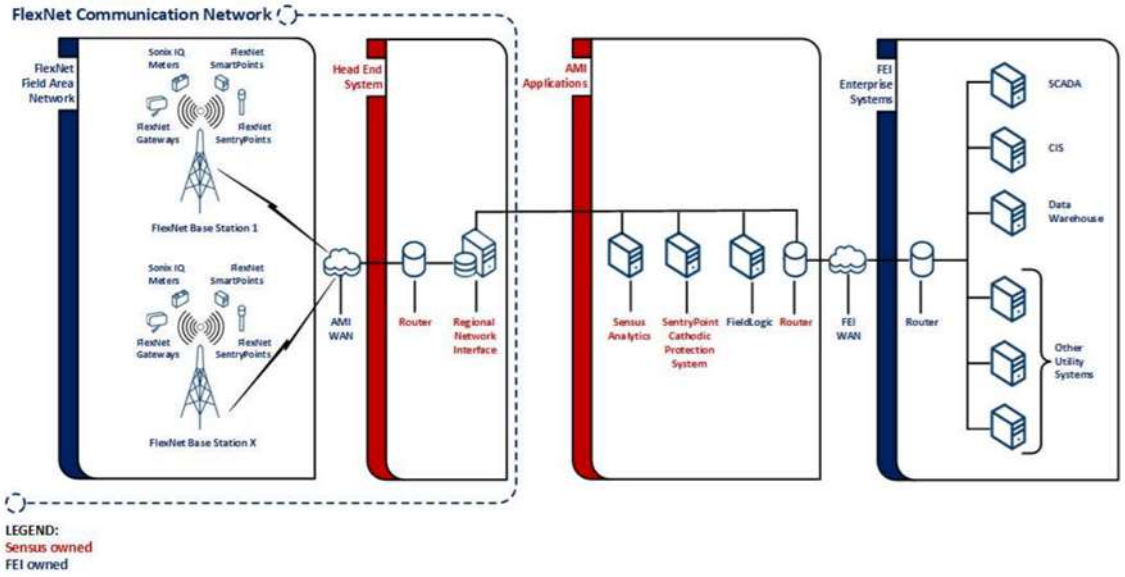
15.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.4, pp. 77–81; Exhibit B-2, Attachment 2

The Project Architecture and Technical Components Described

Figure 5.1, on page 77 of the Application, provides a depiction of the Project Logical Architecture. In Attachment 2 of Exhibit B-2, FEI provides a higher resolution version of the same figure, which is reproduced below.

Figure 1-1: Project Logical Architecture



On page 81 of the Application, FEI states:

> The following Project applications will be owned, installed, operated and maintained by Sensus as a SaaS model:
>
> - Head End System (Regional Network Interface (RNI)™) – IT hardware and software;
> - Sensus Analytics – IT hardware and software; and
> - SentryPoint cathodic protection – IT hardware and software.
>
> Although owned by FEI, the FlexNet communication network (End Points, Base Stations, and AMI WAN) will be also be operated and maintained as managed services by Sensus.
>
> Sensus will provide data centre services including, but not limited to, hardware and software patching, updates and upgrades. Additionally, Sensus will provide 24 x 7 x 365 monitoring of the availability and performance of the applications to ensure they are available to FEI.

15.1 Please explain, with rationale, how FEI determined which items are proposed to be FEI owned/operated and which items are proposed to be Sensus owned/operated.

Response:

The primary considerations for software ownership and operation include:

- Total cost of solution;
- Ease of keeping software systems up-to-date; and
- Security of systems and data.

The primary considerations for communications hardware ownership and operation include:

- Total cost of solution;
- Control over network coverage;
- Control over backhaul options;
- Discretionary ability to add infrastructure for growth and resiliency;
- Ease of monitoring and maintaining network infrastructure; and
- Security of systems and data.

The following table compares attributes of the selected Sensus Software as a Service (SaaS) model versus licensing the Sensus software and installing it on-premises.

Pros	Cons
• Software upgrades & patching support performed by vendor • Lower risk of software upgrade compatibility issues as vendor is testing and developing on a platform similar to production • Testing of new software is limited to the integrations between FEI and Sensus systems • Earlier access to the latest software features • Industry experts • Strict security protocols & controls	• Less control over when upgrades occur

The following table compares attributes of the selected model in which FEI owns the FlexNet hardware and Sensus operates the communications network versus FEI owning and operating the FlexNet network.

Pros	Cons
• More control over data backhaul options (resiliency) • More control over site locations • Ability to add new locations to improve performance or increase resiliency • Ability to directly negotiate site lease arrangements with third-parties (e.g. First Nations) • Sensus expertise for day-to-day network operation and troubleshooting	• Less able to hold vendor accountable for network performance issues • More effort required to negotiate site leases • More effort required to monitor network performance

Cost was not a significant factor in the selection of network hardware or software as all solutions were similar on an NPV basis.

15.1.1 Please discuss what alternatives FEI considered with respect to this asset ownership/operations structure, and why they were rejected.

Response:

Please refer to the response to BCUC IR1 15.1.

15.1.2 Please discuss the benefits and risks of the proposed asset ownership/operations structure, as compared to any feasible alternatives.

Response:

The proposed asset ownership/operations structure was chosen based on recent industry trends and experience gained with FBC's electric AMI project. The proposed operational structure provides a variety of benefits when factoring in patching support and system upgrades. These benefits include the ability to scale the application, expand and provide extra capacity only when needed, address growth without investing in new hardware, and manage support personnel and administration costs. Working with Sensus leverages industry expertise to support continual improvements in capabilities, usability, and experienced staff. Sensus will handle patching, and hardware upgrades or failures, eliminating up-front costs to set up infrastructure and ongoing maintenance. Sensus additionally employs a number of security controls such as virus scanning, firewalls, and intrusion detection systems supported by a dedicated team of data centre security experts. Based on the proposed asset ownership/operations structure described above, the risk

of a SaaS model with Sensus is low based on Sensus' maturity providing this service. Finally, FEI maintains the ability to monitor the vendor and ongoing operations.

15.2 Please identify the duration of FEI's contract with Sensus for its Managed Services and Software as a Service (SaaS) solutions.

Response:

FEI's contract with Sensus for Managed Services and SaaS solutions has a term of 20 years, with an option for three additional years. This term commences coincident with meter deployment. This term was chosen to ensure services were available for the expected lifespan of the technology.

15.2.1 Please discuss how FEI determined this term of contract to be reasonable.

Response:

Please refer to the response to BCUC IR1 15.2.

15.2.2 Please also discuss what alternative terms were considered and why they were rejected.

Response:

Please refer to the response to BCUC IR1 15.2.

On pages 77–78 of the Application, FEI discusses the Sensus FlexNet field area network. FEI states:

> The Sensus FlexNet field area network (FAN) is a long-range radio network that provides scalable and reliable two-way communication infrastructure enabling communication modules (End Points) installed on meters or other field-based

devices to transmit data for collection by Sensus FlexNet Base Stations (Base Stations).

Base Stations are long-range radio transceiver data collectors, usually mounted on tower and tall building infrastructure to ensure optimal coverage over large geographic areas. They provide two-way communication to the End Points described below and the Sensus Head End System (described in Section 5.4.1.2).

Information, such as meter consumption and status, will be transmitted to Base Stations at regular intervals by the following, which are collectively referred to as End Points:

Sensus FlexNet Gateways: standalone communication modules for station and pipeline/gas main sensing applications;

Sensus SonixIQ™ advanced meters: customer meters that comprise the majority of the Project End Points;

Sensus FlexNet SmartPoint® modules: communication modules to be mounted on existing gas meters where no installation of an advanced meter is contemplated; and

Sensus FlexNet SentryPoints™: communication 1 modules to be installed on the gas network for cathodic protection applications (described in Section 5.4.1.4.2).

15.3 Please discuss, in general terms, how the base stations will be installed and what infrastructure they will be installed on. For example, is FEI installing the towers or will FEI be leveraging existing tower / install stations for this equipment?

Response:

In general, the Sensus FlexNet Base Stations will be installed on existing FEI-owned or third-party owned infrastructure including at the top of tall buildings and communications towers. They consist of a small (approximately 0.6 m x 0.6 m x 0.3 m) equipment enclosure that would be installed at a safe and convenient location near electrical power and connected to an antenna by cabling. The antenna would be located nearby or at some distance (20 to 40+ metres) from the equipment enclosure depending on the site. The picture below illustrates a typical FlexNet Base Station installation on the side of a building.

15.4 Please discuss what rights of way, access agreements, or other similar type agreement FEI requires (if any) to utilize the infrastructure noted.

Response:

As discussed in the response to BCUC IR1 15.3, FEI expects to enter into lease agreements with third parties for the use of their existing infrastructure to install the AMI network equipment.

15.4.1 For any rights of way or agreements noted, please identify whether FEI has these agreements in place, or whether they are pending.

15.4.1.1 If pending, please discuss the risks to FEI and to the AMI Project of not obtaining these agreements.

Response:

The lease agreements referenced in the response to BCUC IR1 15.4 are not currently in place. Due to the flexibility of the design and the opportunity to move FlexNet Base Station locations to other infrastructure, the risk is not related to an inability to obtain an agreement but rather to an inability to obtain an agreement on a timeline that is not detrimental to the Project. Due to existing well-established relationships with multiple tower vendors, this Project risk is considered low.

For efficient deployment of meters, the Base Stations need to first be operational in an area in order to properly commission the end-to-end communications technology. If network coverage is not available at a meter at the time of installation, an installer can still install the meter; however, a resource must return to the site to complete commissioning once the network becomes active.

The FlexNet network is designed with redundancy; therefore, meters will be able to communicate to multiple Base Stations. This further minimizes the risk that a delay in obtaining lease agreements for individual Base Station installations would cause deployment schedule delays. To minimize the risk of multiple lease agreements not being obtained in time, FEI is proactively finalizing the Base Station design and plans to engage with infrastructure owners prior to, but subject to, regulatory approval of the Project.

15.5 Please clarify where the Sensus FlexNet Gateways will be mounted.

Response:

Sensus FlexNet Gateways would be mounted on, or near, existing station, transmission or distribution equipment. The mounting location would be dependent on the equipment being monitored and its installation. As an example, the following picture illustrates the installation of a FlexNet Gateway on a pressure monitoring station located in a pit below the equipment enclosure. The FlexNet Gateway can be seen as the small grey box on the bottom of the enclosure.

15.5.1 If applicable, please discuss what rights of way, access agreements, or other similar type agreement FEI requires to utilize the infrastructure noted and whether these agreements are in place.

Response:

Please refer to the responses to BCUC IR1 15.4 and 15.4.1.

On page 79 of the Application, FEI discusses the FlexNet Communication Network. FEI states:

> The FlexNet communication network is the infrastructure that enables secure, dedicated (licensed radio-frequency spectrum) two-way data transmission between the End Points and Base Stations, and the HES. Through the AMI wide area network (WAN), which will be supplied and managed by FEI, data from the Base Stations is received, aggregated and forwarded to the HES.

15.6 Please discuss the permitting requirements with respect to obtaining a radio-frequency spectrum license(s).

Response:

Before deployment of the FlexNet network can commence, FEI is required to apply for and receive approval of radio licenses for the planned Base Stations in each area. This application consists of a process where FEI details its technical solution, and the Spectrum Management Operations Branch of Innovation, Science and Economic Development Canada will evaluate the application for adherence to existing wireless spectrum band plans and other regulations, coordinate with existing users in Canada and the USA, and study potential interference before approving the application.

15.6.1 Please explain, with rationale, whether it is FEI or Sensus obtaining this license, and whether it is obtained or pending.

15.6.1.1 If pending, please discuss the risks to FEI and to the Project of not obtaining this license.

Response:

FEI will apply for these licenses with assistance from Sensus. As owners of the network and the equipment, FEI is the required licensee. Applications have not been put forward for these spectrum licenses as the process requires that FEI be ready to install and pay for spectrum when it is granted. However, FEI has been in contact with the licensing entities to discuss the needs of the Project and has confirmed there is spectrum available for its needs.

15.7 Please discuss whether FEI considered alternatives to establishing its own communication network, such as utilizing networks owned by others (such as British Columbia Hydro and Power Authority (BC Hydro), Telus, Rogers, etc.).

15.7.1 If yes, please discuss the alternatives considered and why each was rejected.

15.7.2 If no, please explain why not.

Response:

FEI considered alternatives to establishing its own communication network as part of the formulation of the AMI Project. The network architecture was chosen as part of the network vendor RFP. This RFP did not constrain which communications network ownership models or technologies would be acceptable.

Please also refer to Confidential Appendix 3 of the Application Supplemental Information (Exhibit B-2-1), which summarizes the proponent's solutions, including any proposed third-party communication networks.

16.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.5.1.2, p. 82; Section 5.5, p. 84; Section 5.5.2, p. 85; Appendix D

Implementation Approach and Project Schedule

On page 82 of the Application, FEI states: "Sensus and FEI will complete a number of joint workshops to define technology and integration requirements of the AMI Solution."

16.1 Please discuss the process by which schedule and cost estimates for technology and integration development were created for the project.

Response:

For cost estimates regarding technology and integration, there are two components: work that will be done internally; and work that is in the scope of work for the AMI system vendor.

The cost estimates for the work to be supplied by the vendor were derived from prices that are included in a contract between the vendor and FEI.

For internal work associated with technology and integration, the AMI team worked with FEI's internal Information Services (IS) department, and through collaborative working sessions determined preliminary estimates for technology and integration based on past experience with similar scopes of work. The following areas were evaluated in the estimates: System and Data Interfaces, Workforce Management, Data Repository, Customer Service Systems, SAP and Application Support and Operating Environment.

The preliminary schedule for the technology and integration was developed iteratively using milestones that are embedded in the vendor contract and estimating the availability of internal resources.

The cost and schedule estimates are based on conducting industry evaluations, completing a detailed RFP exercise with multiple responses, meetings and presentations with vendor proponents, and leveraging the expertise of FEI's IS department, the AMI team and consultants. The preliminary pre-workshop schedule and cost estimates are based on the information known at the time of compiling the schedule.

16.1.1 Please discuss why the pre-workshop schedule and cost estimates proposed for technology and integrations for the AMI Project are reasonable.

Response:

Please refer to the response to BCUC IR1 16.1.

16.1.2 Please detail FEI's contingency plan should the workshops demonstrate the technology or integration plans to be more complex than initially estimated.

Response:

FEI's estimation methodology provides a reasonable estimate for the IS portion of the Project. FEI will finalize the Project plan, including validation of the technology and integration requirements, during the Define phase of the Project implementation (as described in Section 5.5.1.2 of the Application). In addition, as part of the development of the Application, FEI included a contingency for this work which follows AACE recommended practice 40R-08 *Contingency Estimating General Principles* and takes into account the risk analysis done for the technology and integration.

On page 84 of the Application, FEI states:

> Table 5-2 details the broad, preliminary schedule by implementation phase. After receipt of BCUC approval, FEI will issue a Notice to Proceed to Sensus and the to-be selected Deployment Vendor, allowing 90 days to mobilize for implementation.
>
> An overview of the summary schedule, in a Gantt chart, is provided as Appendix D.

Appendix D to the Application provides a project implementation schedule.

16.2 Please provide a more detailed project schedule that includes, but is not limited to:

- critical dates of key events, such as approvals required from other agencies or key contractual milestones;
- interdependencies between events; and
- the project's critical path.

Response:

FEI developed a preliminary Project plan that divides the Project into phases (as described in Section 5.5.1 of the Application) and schedules associated activities to inform the AMI CPCN

proposal. The preliminary Project schedule was necessary to estimate resource requirements throughout the proposed implementation schedule. However, the Project plan is subject to change as the Project plan is finalized and implementation proceeds.

Finalization of the Project plan is dependent upon confirmation of advanced meter deployment strategy and approval of the Application. Therefore, plan finalization will not take place until the Define phase (page 82 of the Application, Section 5.5.1.2) of the Project implementation, at which time preliminary planning assumptions will be validated and the Project's key contractual milestones, interdependent events and critical path will be confirmed.

The preliminary Project plan is provided as Attachment 16.2.

16.3 Please provide a list of all required federal, provincial and municipal approvals, permits, licenses or authorizations required as part of the AMI Project.

Response:

The following is a list of the required federal, provincial and municipal approvals, permits, licenses or authorizations identified by FEI as required for the AMI Project:

- Measurement Canada advanced meter approval required by Sensus (federal);
- Measurement Canada dispensation from meter reverification required by FEI (federal);
- Technical Safety BC Alternative Safety Approach approval required by FEI (provincial); and
- Innovation, Science and Economic Development Canada radio frequency license approval required by FEI (federal).

Table 5-2, on page 85 of the Application provides the AMI Project schedule. Table 5-2 is reproduced below:

Table 5-2: Project Schedule

Activity	Date
CPCN Filing	May 2021
Prepare	Q2 2021 – Q3 2022
Define	Q2 2022 – Q2 2023
Design, Build, Integrate and Ready For Deployment	Q2 2022 – Q3 2024
Deploy AMI Technology/Billing System Integration	Q3 2022 – Q3 2023
Deployment Region 1: Lower Mainland South	Q4 2022 – Q2 2025
Deployment Region 2: Lower Mainland North	Q2 2024 – Q4 2026
Deployment Region 3: North Interior	Q2 2023 – Q3 2025
Deployment Region 4: South Interior	Q1 2023 – Q2 2026
Deployment Region 5: Vancouver Island	Q3 2023 – Q3 2026
Deployment Region 6: Kootenays	Q3 2024 – Q4 2026
Deploy Enterprise Data Repository, Customer Portal, Leak Detection	Q1 2024 – Q1 2025
Final Acceptance	Q3 2026
Close Out	Q3 2026 – Q4 2026

16.4 Please discuss whether the customer portal will be available for initial customers in Deployment Region 1 at the time of deployment in Region 1.

16.4.1 If not available for initial customers, please explain why not and the potential impact to these customers.

16.4.1.1 Please also discuss whether other schedule options for the customer portal were considered and why they were rejected.

Response:

The customer portal is scheduled to be available to customers in Q1 2025, approximately halfway through the meter deployment.

Other schedule options that would have allowed earlier completion of the customer portal were considered, but were rejected for the following reasons:

- customer portal development requires many of the same personnel as development required to enhance the billing system to use AMI reads and enable deployment vendor meter exchanges; and
- customer portal development requires the same test software environments as development required to enhance the billing system to use AMI reads and enable deployment vendor meter exchanges.

Both enhancements to the billing system and integration to facilitate deployment vendor meter exchanges are critical path project items to ensure the AMI system can be put into operation, with potentially costly risks associated with delays (e.g., continued manual reading, deployment vendor delays). For this reason, development of the customer portal is scheduled to occur after completion of these items.

17.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.6, p. 86

Project Sponsorship

On page 86 of the Application, FEI states the following regarding the AMI Program Director:

> *The Director, Energy Measurement & Technology* holds overall accountability for acceptable delivery of the AMI Solution on time, in scope and on budget. The AMI Program Director will ensure that sufficient and appropriate resources are assigned, and provide business context expertise, support and guidance to the Project delivery team to ensure obstacles are removed and business objectives of the Project are achieved. In this role, the AMI Program Director will also keep abreast of Project activities to ensure adequate and consistent communication between the AMI Project Executive Sponsor, the Project team and representatives from all major aspects of FEI operations.

17.1 Please discuss whether the AMI Program Director is a full-time position at FEI.

17.1.1 If not, please discuss why not and how FEI is ensuring there is sufficient oversight of the AMI Project.

Response:

FEI confirms that the AMI Program Director is a full-time position within the Project. The words "In this role" were not intended to suggest that the AMI Program Director would hold other roles.

18.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.7, p. 90

Risk Analysis and Contingency Determination

On page 90 of the Application, FEI states:

> Additionally, FEI solicited risk knowledge from a consultant familiar with several North American AMI implementation projects and spoke to several utilities who have deployed electric and gas AMI solutions.

18.1 Please identify the utilities who have deployed a gas AMI solution referenced in the preamble above.

18.1.1 Please describe the key learnings from these discussions and how they informed the AMI Project.

Response:

FEI spoke to the following utilities that have deployed a gas AMI solution:

- Atmos Energy;
- Consumers Energy;
- Duke Energy and
- SaskEnergy.

In addition to leveraging FBC's experience, FEI also spoke to the following utilities that deployed an electric AMI solution:

- Alectra Utilities;
- BC Hydro;
- EPCOR Utilities and
- North Little Rock Electric.

During these discussions, FEI identified a number of key learnings. Following is a list of these learnings, and the action that FEI has taken to address them:

- Importance of a strong change management program:
    - FEI has developed a Project organizational structure that includes a People and Process team. In addition to leading the internal and external communications effort and development of internal training programs, this team will also facilitate discussions with internal stakeholders during the Define phase of Project

implementation. During the Define phase, FEI will develop the processes impacted by the AMI technology.

- Importance of a strong communications program:
  - FEI has developed an internal and external communications strategy to ensure employee, customer, and other stakeholder questions/concerns are addressed and to ensure that employees, customers, and other stakeholders are informed of key milestones.
- Importance of a radio off option:
  - FEI will provide a radio-off option for its customers.
- Negotiate a time and materials rate ahead of time in case it is required:
  - In the deployment vendor RFP, FEI has asked for time and material rates from all the proponents.
- Importance of identifying contractor key personnel in the project contracts
  - In the technology and draft deployment vendor contract, FEI has developed a section that identifies contractor key personnel. Penalty language has been developed in the event a contractor removes someone in a key role without FEI's consent.
- Importance of a strong process for customer call backs:
  - In the draft deployment vendor contract, FEI has inserted financial penalties for work that FEI has to complete that should have been completed by the contractor.
- Importance of an effective, utility-led quality assurance (QA) program:
  - In addition to existing field resources, FEI has identified additional QA inspectors in its Project plan.
- Importance of holding frequent meetings to ensure issues are quickly identified and resolved:
  - In the technology and draft deployment vendor contract, FEI has established a daily meeting frequency that contractor representatives must attend. In-person meetings are scheduled as well.

19.0 Reference: PROJECT DESCRIPTION

Exhibit B-1, Section 5.8, pp. 92–93

Security

On page 92 of the Application, FEI states:

> FEI's objective is to follow the security specifications set out in the AMI-SEC58 AMI System Security Requirements. In addition, FEI will ensure that security audits are carried out by a third-party agency during implementation and on an on-going basis thereafter to verify that the AMI Solution implemented continuously meets or exceeds the security standards as set forth in AMI-SEC.

Footnote 58 on page 92 of the Application states:

> AMI-SEC is a North American Advanced Metering Infrastructure task force charged with developing security guidelines, recommendations, and best practices for AMI system elements.

19.1 Please discuss why it is FEI's objective to follow AMI-SEC. In the response, please discuss whether there are any risks to meeting this objective and how FEI is mitigating these risks.

Response:

FEI's objective is to follow security specifications outlined by AMI-SEC, as it provides both the utility industry and vendors with a basic set of security requirements for AMI systems. However, AMI-SEC was intended to be a set of guidelines and is not regularly updated. Consequently, FEI also uses regularly updated security standards applicable to AMI systems provided by organizations such as the National Institute of Standards and Technology (NIST) to ensure the AMI system follows the most current security standards. FEI has not identified any risks associated with following the guidelines set out by AMI-SEC.

To ensure the continued security of the AMI system and mitigate security risks, regular auditing and testing of the AMI system security will be performed by independent third-party experts. Recommendations from these independent assessments will be used to enhance or upgrade the AMI system security, if required.

19.2 Please confirm whether FEI will also require Sensus to adhere to AMI-SEC.

19.2.1 If no, please explain, with rationale, why not. Please identify the risks associated with Sensus not adhering to AMI-SEC and how FEI will be mitigating these risks.

Response:

Sensus will follow the guidelines set out by AMI-SEC, and, as described in the response to BCUC IR1 19.1, Sensus will also use up-to-date guidelines provided by organizations such as the NIST to ensure the AMI system follows the most current security standards.

19.3 Please list all cybersecurity standards that will be adhered to by FEI and by Sensus with respect to the AMI system security.

Response:

FEI and the Sensus FlexNet system conform to the following cybersecurity standards with respect to the AMI system security:

- NIST (7628)
  - NIST Suite B Compliant AES-CCM Symmetric Data Encryption (NIST SP800-38C)
  - ECC-256 ECDH (SP800-56A, NIST SP800-56C)
  - ECDSA Digital Signature Verification (NIST 186-4)
- NERC-CIP – sections of the following CIP standards pertinent to a service provider:
  - CIP-002-5.1a
  - CIP-003-6
  - CIP-004-6
  - CIP-005-5
  - CIP-006-6
  - CIP-007-6
  - CIP-008-5
  - CIP-009-6
  - CIP-010-2
  - CIP-011-2
  - CIP-014-2

On Page 93 of the Application, FEI states:

> FEI retained a cybersecurity expert consultant to provide a detailed analysis on mechanisms built into the Sensus AMI technology and in particular to how the Company will be using the technology and integrating it with existing and new systems as part of the Project. This independent analysis concluded that the system provides sufficient levels of security for the purposes of its intended use and made recommendations that will inform definition and design deliverables of the Project.

19.4 Please expand on and summarize the findings from FEI's cybersecurity expert consultant.

Response:

The report by the cybersecurity consulting firm provided a complete cybersecurity review of the proposed AMI system including, but not limited to, the:

- Governance structures which manage and evolve security policies driving procedural coordination of the daily activities;
- Governance structures that shape the frequency, depth, independence, and reporting transparency of security audits;
- Product roadmap with respect to addressing security posture improvements;
- Configuration and process decisions to ensure encrypted operation of all devices;
- Secure Sockets Layer (SSL) certificate management for end-to-end encryption to and from endpoints;
- Change management and control processes to ensure that changes are reviewed, tested, approved and documented;
- Segmentation of the AMI network;
- Whole disk encryption; and
- AMI Operations and Maintenance documentation package that integrates technical design specifications, extends existing FEI policy and procedure documentation into the AMI eco-system and ensures appropriate operational capability is available and accounted for as the system is deployed and managed.

In summary, the report provided sufficient detail to confirm that FEI's AMI system will be secure. It also recommended that FEI continue to reference the National Institute of Standards and Technology (NIST) Cybersecurity Framework V1.1.

19.5 Please indicate whether the expert conducted, or determined that Sensus has conducted, adequate cybersecurity audits of their SaaS platforms including networking, hosted systems and any integrations where other clients are connected, and provided those results to FEI.

19.5.1 If yes, please discuss the results and the criteria used by FEI and their expert consultant to assess the security as sufficient.

19.5.2 If no, please discuss why not.

Response:

The expert consultant did not conduct, or determine that Sensus has conducted, a cybersecurity audit on the system proposed for FEI. It will only be possible to complete an audit and cybersecurity test of the proposed system once it is configured, due to the specific nature of the integration with FEI and the Sensus AMI systems. The security of the system will be tested during development, and a full audit and cybersecurity testing will be conducted prior to going live.

Other reference clients using the Sensus SaaS platform have confirmed to FEI that they perform regular cybersecurity testing and did not indicate any material cybersecurity issues with their specific configurations.

19.6 Please discuss whether FEI and Sensus' plans ongoing cybersecurity audits, testing and re-validation of environments.

19.6.1 If yes, please describe FEI and Sensus' plans and discuss on what frequency these audits will be conducted.

Response:

Confirmed, FEI plans ongoing cybersecurity audits and testing of software environments. This includes annual penetration testing, and ongoing certification to industry standards.

D. PROJECT COST

20.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.2, pp. 98–99

Capital and Operating Cost Summary

On page 98 of the Application, FEI provides a summary of the estimated capital and Operations and Maintenance (O&M) costs of the AMI Solution, the current Baseline meter program costs, and the incremental costs, as follows:

Table 6-1: Capital and Operating Cost Summary

Project Costs As-Spent in $Millions		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)	
Line	Item	2021 - 2022 (1)	2023 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	Reference [1] (6)
AMI							
1	Capital[2]	48.6	589.8	638.4	119.3	757.7	Schedule 6,Line 46 + Schedule 9,Line 31+Line 39+Line 41+Line 43
2	O&M	34.7	72.8	107.6	234.3	341.9	Schedule 2,Line 13
BASELINE							
3	Capital	46.8	115.6	162.4	474.3	636.7	Schedule 6,Line 28
4	O&M	35.1	77.2	112.3	548.2	660.5	Schedule 6,Line 12
INCREMENTAL [3]							
5	Capital	1.8	474.2	476.0	(355.0)	121.0	Schedule 6,Line 39 + Schedule 9,Line 28+Line 36+Line 40
6	O&M	(0.4)	(4.3)	(4.7)	(313.9)	(318.6)	Schedule 2,Line 14

On page 99 of the Application, FEI states: "FEI has prepared the cost estimates based on AACE Class 3 specifications in accordance with the BCUC's CPCN Guidelines."

20.1 What is the expected accuracy range (in percentages) of the specific Class 3 estimate for the AMI and baseline capital cost estimates, including the confidence level?

Response:

The expected accuracy range for the Class 3 estimate (including contingency), based on AACE recommended practice 18R-97, is -10% to -20% on the low side, and +10% to +30% on the high side.

The contingency was determined based on a one standard deviation range from the expected (mean) value of the deterministic estimate; i.e. P68 confidence level in probabilistic terms.

20.2 Please discuss how the O&M savings from the proposed AMI project will be treated under FEI's current Multi-Year Rate (MRP) Plan and whether the financial analyses account for this treatment.

Response:

Consistent with the BCUC's past recommendation to FEI, "if capital associated with a particular CPCN is excluded from the formula, the CPCN review of that project should include an assessment by the Commission of any potential impact of the project on O&M. If appropriate, an adjustment to the formula based O&M spending envelope should then be made." [6]

FEI considers that, if approved, the net O&M impact of the AMI Project warrants an adjustment to the formula O&M. FEI plans to adjust the Base O&M unit cost under the formula O&M to remove the existing meter reading costs and forecast the new AMI O&M costs as flow-through O&M costs/savings until the end of the MRP term (2024). FEI will provide the amounts for this adjustment (and for any regular capital expenditure changes) in the Annual Review following approval of this CPCN.

Post MRP, the O&M treatment for the AMI O&M will depend on the regulatory framework at that time.

For the purpose of the financial analysis, specifically for the incremental delivery rate impact due to AMI, FEI used only the incremental O&M costs between AMI and the Baseline scenarios over the 26-year analysis period which covers both the MRP and post-MRP period. This is effectively the same as removing the existing meter reading costs from the formula O&M as mentioned above and therefore, only the incremental between the new AMI O&M costs and the existing O&M costs will be included to the delivery rates for recovery from FEI's customers.

20.3 Please discuss the drivers for the decrease in incremental capital spending of $355 million in the post-deployment phase for the AMI scenario.

Response:

Table 6-2 in Section 6.2.1 of the Application provides a more granular breakdown of the $355 million[7] into the categories of capital where the capital savings are expected to come from. FEI provides Table 6-2 of the Application below with additional discussion regarding each category following the table.

[6] Order G-138-14 page 182, "the Impact of Capital on O&M".
[7] Table 6-2, Column 4, sum of lines 11-16.

Project Capital Costs As-Spent in $Millions		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)	Reference [1]
Line	Item	2021 - 2022 (1)	2023 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	(6)
1	Meter Capital	28.4	507.9	536.3	111.7	648.0	Schedule 6, Lines 3 through 9
2	AMI Project Management	15.6	38.0	53.7	-	53.7	Schedule 6, Lines 13 through 17 + Schedule 9 Lines 31+39+41
3	AMI Network & Software	3.6	24.4	28.0	6.4	34.4	Schedule 6, Lines 10 through 11
4	Non-Meter Capital	0.1	3.5	3.6	1.2	4.8	Schedule 6, Line 12
5	AFUDC	0.9	15.9	16.8	-	16.8	Schedule 6, Line 36 + Schedule 9 Line 43
6	**AMI Solution**	**48.6**	**589.8**	**638.4**	**119.3**	**757.7**	Sum of Lines 1 through 5
7	Meter Capital	46.6	112.5	159.1	456.0	615.1	Schedule 6, Lines 1 through 5
8	Non-Meter Capital	0.2	3.1	3.3	3.2	6.6	Schedule 6, Lines 6
9	Meter Reading Capital	-	-	-	15.1	15.1	Schedule 6, Lines 7 through 9
10	**Baseline**	**46.8**	**115.6**	**162.4**	**474.3**	**636.7**	Sum of Lines 7 through 9
11	Meter Capital	(18.2)	395.4	377.3	(344.4)	32.9	Line 1 less Line 7
12	AMI Project Management	15.6	38.0	53.7	-	53.7	Line 2
13	AMI Network & Software	3.6	24.4	28.0	6.4	34.4	Line 3
14	Non-Meter Capital	(0.1)	0.4	0.2	(2.0)	(1.8)	Line 4 less Line 8
15	AFUDC	0.9	15.9	16.8	-	16.8	Line 5
16	Meter Reading Capital	-	-	-	(15.1)	(15.1)	Line 9
17	**Project Costs[2]**	**1.8**	**474.2**	**476.0**	**(355.0)**	**121.0**	Sum of Lines 11 through 16 [3]

The $355 million of reduced spending in the post deployment phase breaks down as follows:

- $344.4 million savings in meter capital results from the full meter fleet being exchanged in the AMI deployment phase reducing the volume of meter exchanges that would occur otherwise in the baseline scenario.
- $15.1 million savings in avoided in-house meter reading capital results from the AMI functionality materially replacing manual reading costs, and provides FEI the opportunity to avoid capital costs associated with future in-house meter reading.
- $2.0 million of avoided costs under non-meter capital as cathodic protection sensors, cellular infrastructure, and station and portable pressure recorders are no longer needed in the post deployment phase with the AMI network.
- $6.4 million of new sustainment capital costs during the post deployment phase for ongoing AMI network hardware and software upgrades.

20.4 Please discuss how FEI determines whether cost items, such as the AMI network and software costs, are categorized as either capital expenditures or operating expenses.

Response:

FEI categorized the costs to build, install, set up and maintain the AMI network and software which will be providing benefits over the life of the assets (or software) as capital expenditures. These expenditures provide probable future economic benefit, and are considered directly attributable costs that are necessary to bring the asset to the condition necessary for its intended use, and therefore is consistent with recognition as capital under US GAAP, including concepts outlined in ASC 360 Property, Plant and Equipment. The reoccurring annual costs for network and software

that include charges for items such as licensing costs, hosting, and managed services has been categorized as operating expenses as they are period expenditures that do not provide future economic benefit.

20.5 Please discuss any cost items not included in the estimate and the reason for the exclusion.

Response:

FEI has identified and included all reasonable incremental capital and O&M costs as well as savings associated with the AMI Project in the analysis. Specifically, the costs include exchanging the current meter fleet from diaphragm meters to AMI meters, managing the Project, and installing as well as operating the AMI network and software. The costs, as presented in Section 6 of the Application, reasonably include all costs to execute and sustain the Project.

20.6 Please provide a cost sensitivity analysis on the risks (costs and delay of O&M savings) due to a delay in the planned deployment schedule of (i) six months; (ii) one year; and (iii) two years. Please provide the resulting impact on the incremental NPV and rates for each scenario.

Response:

FEI provides the following table summarizing the Incremental NPV of annual revenue requirement and the levelized delivery rate increase for each of the scenarios requested.

ITEM	Baseline	AMI			
	As Filed	As Filed	6 Months Delay	1 Year Delay	2 Years Delay
NPV Annual Revenue Requirement ($Millions)	$ 1,232	$ 1,247	$ 1,257	$ 1,266	$ 1,276
Levelized Delivery Rate Impact (%)	10.223%	10.348%	10.426%	10.506%	10.589%
		AMI Incremental to Baseline			
Incremental NPV Annual Revenue Requirement ($Millions)		$ 15	$ 25	$ 34	$ 44
Incremental Levelized Delivery Rate Impact (%)		**0.125%**	**0.203%**	**0.283%**	**0.366%**

The above analyses were based on the following assumptions:

- There is no change to the Baseline scenario as included in the Application;

- For each AMI delay scenario, FEI shifted the deployment and post deployment costs (capital and O&M) from the original schedule (as filed) by six months, one year, and two years, respectively; and
- For the six-month and one-year delay scenarios, FEI assumed the current fixed pricing will be maintained. However, for the two-year delay scenario, FEI will require a new contract renegotiation. For the purpose of this analysis, FEI has assumed the fixed costs will be inflated by 2 percent per annum under the two-year delay scenario.

21.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.2.1, pp. 101–102, 104; Section 5.3.3.2, p. 75

Capital Cost Assumptions

On page 101 of the Application, regarding meter hardware for both the AMI and baseline scenarios, FEI states:

> FEI notes the Baseline meter exchange units are based on FEI's current meter exchange and sampling program. The Post-deployment phase for Baseline includes the continuation of the Baseline existing meter exchange program, and AMI includes an annual allowance of 0.50 percent of meter failures that would require replacement based on historical failure data provided by the manufacturer.
>
> …
>
> Based on FEI's experience, approximately 50 percent of the time a meter is exchanged, the regulator also needs to be replaced. FEI has included in the cost estimates the assumption that 50 percent of regulators will be replaced in both AMI and Baseline scenarios.

21.1 Please discuss FEI's historical experience which resulted in the assumption that when meters are exchanged 50 percent of regulators will need to be replaced, for both the AMI and baseline scenarios.

Response:

Since 2003, FEI has had a regulator "ever-greening" (replacement) program that involves replacing older and obsolete in-service regulators with new regulators. During the development of this program, FEI held discussions with regulator suppliers and conducted non-destructive regulator testing. The outcome of these efforts coupled with the Company's field experience, allowed FEI to determine, for safety reasons, 30 years is the appropriate service life of an installed regulator. This 30-year service life and the 20-year advanced meter life indicates that regulators older than 10 years will be replaced during AMI deployment as FEI would not be visiting the new advanced meters again for 20 years. Based on the age of FEI's current in-service regulators and FEI's experience in managing this sustainment capital program, FEI expects that 50 percent of the existing small commercial and residential regulators will be replaced during the AMI Project.

21.1.1 Please confirm, or explain otherwise, that the same assumption is used for the AMR financial analysis.

Response:

Confirmed. The AMR financial analysis also assumes a new regulator will be installed at 50 percent of the meter exchanges. This is the same assumption used in the AMI and Baseline scenarios.

21.2 Please provide the industry average rate for meter failures and regulator replacements and please provide examples from other gas utilities in North America as a benchmark.

21.2.1 Please explain how FEI's assumptions used compare to the industry average and benchmark utilities.

Response:

FEI is not aware of any publicly available data that pertains to meter failures and regulator replacements from other North American utilities. This meter failure estimate for the financial model was determined through Sensus's review of warranty and failure data for similar products. The information provided by Sensus correlated with the experience of both FBC and FEI.

On page 102 of the Application, regarding meter hardware specific to the AMI solution, FEI states: "The cost of the regulators is based on FEI's current cost with the addition of a bulk volume discount and fixed term pricing during Deployment for the AMI Solution scenario."

21.3 Please provide the amount and rate of the bulk volume discount applied to the cost of the regulators for the AMI solution scenario.

Response:

In the AMI solution, regulators are sourced in USD and a discount rate of four percent or $1.32 USD per regulator has been included in the deployment phase of the Project. FEI notes the estimated total value of the regulator discount included in the analysis is $637.5 thousand USD.

21.4 Please provide the basis for the discount rate used and please explain why it is appropriate.

Response:

FEI's preferred regulator supplier has stated in its proposal the value of the bulk volume discount offered to FEI. The discount rate used is based on FEI's preferred regulator supplier's negotiated discount.

On page 75 of the Application, FEI states that it "previously released an AMI Deployment Vendor RFP in October 2017; however, the process was not completed…" and that it "will release a new RFP in Q2 2021."

Further on page 102 of the Application, regarding meter installation specific to the AMI Solution, FEI states: "FEI is in the RFP process for an AMI Deployment Vendor. Since a vendor-supplied cost estimate is not available, FEI has estimated meter installation costing assuming internal FEI labour and related costs."

21.5 Please elaborate on the rationale for using FEI labour and related costs to estimate the costs of meter installation to be completed by a vendor, as opposed to some other estimate.

Response:

FEI is still finalizing its deployment strategy, including the completion of an RFP process for an AMI deployment vendor. The scope of work that falls within the Project deployment strategy consists of:

- Contacting customers and setting meter exchange appointments;
- Installation of the advanced meters;
- Regulator testing and exchange;
- Bypass valve installation;
- Customer appliance relights; and
- AMI material inventory and related logistics.

FEI currently performs these activities, on average, approximately 60,000 times per year. Consequently, FEI is very familiar with the durations required to complete these activities and the cost per activity. Based on this experience, FEI believes using its own cost structure is appropriate for determining the deployment budget. In addition, as discussed in the response to BCUC IR1

13.12, the Pilot confirmed a properly trained contractor can complete an advanced meter installation and related ancillary work within the same duration as an FEI field employee.

21.6 Please discuss whether FEI developed an alternative meter installation cost estimate based on FBC's experience or other utility experience. If yes, please provide the alternative cost estimate(s) for each year and please explain why FEI rejected the alternative estimate method(s). If not, please explain why not.

Response:

FEI did not develop an alternative meter installation cost estimate based on FBC's experience or other utility experience.

FEI's advanced meter deployment scope of work is very different from FBC's AMI meter scope of work. The three primary differences are:

1. A meter exchange appointment will be arranged for the majority of FEI's customers, while a meter exchange appointment was not required in most cases for the FBC AMI project. FEI requires an appointment because the customer's gas supply is turned off during the advanced meter installation; consequently, subject to the exception noted in item 3 below, the field technician will enter the customer's premises to relight their appliances.

2. FEI's advanced meter installation duration is significantly longer than FBC's advanced meter installation duration due to the complexities associated with replacing a gas meter versus an electricity meter; and

3. FEI will relight the appliances of customers who had their gas turned off during the advanced meter installation, unless, in very limited situations, the relighting of their appliances is done by the customer. FBC did not need to enter a customer's home after installing an electric advanced meter.

Please also refer to the response to BCUC IR1 21.5 for additional rationale on why FEI only used its own internal durations and costs to develop the cost estimate for the advanced meter deployment.

21.7 Please provide the estimated accuracy of the meter installation costing based on internal labour and related costs.

Response:

The activities within the scope of work defined for the Project deployment strategy are currently performed by FEI employees and are well defined. Consequently, the meter installation cost estimate is consistent with the level of definition for an AACE Class 3 cost estimate, as required by the BCUC 2015 CPCN Guidelines.[8]

On page 104 of the Application, regarding meter reading capital specific to the baseline scenario, FEI states:

> FEI has included in the Baseline scenario the future costs associated with bringing manual meter reading in-house. The capital required to bring meter reading in-house includes one-time technology set up costs, vehicle purchase, and mobile computing hardware that will be used by meter readers. … FEI notes the vehicle and mobile computing hardware will follow a 9-year and 5-year capital refresh rate respectively.

21.8 Please provide the basis for the 9-year vehicle and 5-year mobile computing hardware capital refresh rates.

Response:

In the Baseline scenario that was used to calculate the incremental costs of the AMI Project, the 9-year vehicle and 5-year mobile computing hardware capital refresh rates were based on depreciation rates for the corresponding asset classes. In the financial analysis, FEI used an 11.07 percent (9-year) depreciation rate for the meter reading vehicles associated with asset account 484-00, and a 20 percent (5-year) amortization rate for mobile computing hardware associated with asset account 483-10. Based on this, for the purpose of the financial analysis over a 26-year period, the capital refresh rates for the vehicle and the mobile computing hardware were assumed to occur on a 9 and 5-year cycle respectively.

While preparing this response, FEI noted the financial analysis as included in the Application incorrectly used the depreciation rate of 20 percent from the 2014 Depreciation Study as approved by Order G-119-16 for the mobile computing hardware corresponding with asset class 483-10 instead of the updated depreciation rate of 25 percent from the 2017 Depreciation Study as approved under G-165-20 as part of FEI's 2020-2024 MRP Application.

FEI analyzed the impacts on the financial model of changing the used depreciation rate to 25 percent from 20 percent for mobile computing hardware. Given there is only $0.2 million in capital costs for this asset class, the overall impact on the Project analysis of this error is immaterial and

[8] https://docs.bcuc.com/documents/Guidelines/2015/DOC_25326_G-20-15_BCUC-2015-CPCN-Guidelines.pdf.

FEI does not propose to update the rate impact analysis. The incremental delivery rate impact of the difference between the AMI Project and the Baseline would be reduced by 0.001 percent from 0.125 percent to 0.124 percent.

FEI will be updating its depreciation and amortization rates a number of times over the 26-year financial period; as such, the depreciation rates used in the analysis are based on a point in time. When the assets enter FEI's rate base, the actual depreciation rates will be based on those approved at the time.

21.9 Please provide the industry average capital refresh rates for vehicle and mobile computing hardware for the purposes of manual meter reading and please provide examples from other gas utilities in North America as a benchmark.

21.9.1 Please explain how FEI's 9-year and 5-year capital refresh rates compare to the industry average and benchmark utilities.

Response:

FEI does not have the requested information. Each utility will have specific circumstances that are considered in its depreciation studies, but to the extent there are industry norms to consider, they are already implicit in FEI's approved depreciation rates, as described below. Further, given the small dollar values included in the two relevant asset classes ($3.5 million for account 484-00 and $0.2 million for account 483-10), any variations in depreciation rates would not have a material impact on the financial analysis.

As noted in the response to BCUC IR1 21.8, the capital refresh rates for the vehicle and mobile computing hardware are based on the approved depreciation rates for the associated asset accounts 484-00 and 483-10, respectively. The depreciation rates were reviewed as part of FEI's 2017 Depreciation Study filed as part of FEI's 2020-2024 MRP Application and approved pursuant to BCUC Decision and Order G-165-20. The 2017 Depreciation Study was completed by Concentric, formerly known as Gannett Fleming. The depreciation rates were reviewed by Concentric based on various statistical methods, review of actual retirement activity, operational interviews with FEI, as well as informed judgement of Concentric based on its experience in the gas and electricity industries. As such, FEI believes the current approved depreciation rates would be the most appropriate assumption for the capital refresh rates for the assets rather than using benchmarks from other North American gas utilities. The approved depreciation rates are based on FEI's actual assets as well as Concentric's review and knowledge of gas and electric industry experience.

22.0 Reference: PROJECT COSTS

Exhibit B-1, Section 3.3.3, pp. 34–35; Section 6.2.2.3, p. 108

Baseline Scenario – In-House Meter Reading

On page 34 of the Application, FEI states:

> While FEI has chosen to continue contracting for meter reading services from Olameter in the short term, FEI believes the viability of contracted meter reading services in the future is uncertain, in terms of both cost and availability.

On page 35 of the Application, regarding the current outsourcing of manual meter reading FEI states that "the costs for this third-party support will continue to grow and approach the cost of providing the service in-house." FEI further states: "In-house meter reading would be more costly than the current outsourced model but would bring with it certainty over levels of service and future expenses."

On page 108 of the Application, FEI states:

> For the reasons set out in Section 3.3.3, FEI's Baseline scenario assumes manual meter reading would continue to be contracted out to a third party until the end of 2026 when the renewal periods of the existing manual meter reading contract expire, and, for the purposes of the financial analysis, assumes that FEI would convert to an in-house approach thereafter.

22.1 Please expand on the reasons why FEI believes that meter reading services from Olameter may not be viable in the future from a cost and availability perspective.

Response:

As discussed in Section 3.2 of the Application, the utility industry in North America has been moving away from manual meter reading as a whole. According to the CGA Insights Matter Survey attached as Appendix C to the Application, there is only one other natural gas utility in Canada that continues to read meters manually with an external manual meter reading vendor. With less demand for manual meter reading, there is less competition.

The future market for manual meter reading vendors is uncertain, and the outcome of commercial negotiations beyond FEI's current contract with Olameter is unknown. However, FEI expects that the number of vendors providing manual meter reading services will continue to drop, which in turn will reduce FEI's options for parties with whom to contract, or a competitive bidding process, and as such, may subject FEI's customers to price vulnerability.

FEI has certainty that, under the terms of its current contract with Olameter, inflationary increases are embedded in pricing until the end of 2026. Beyond that, the cost of manual meter reading by an external vendor is unknown, as is the availability of such vendors.

22.2 Please discuss when FEI expects the cost of outsourcing meter reading to approach the cost of providing the service in-house.

Response:

Although the trend for outsourced manual meter reading costing is converging with the costs of reading meters in-house, the future costs of outsourcing manual meter reading are uncertain. It is therefore not possible to assess when the cost of outsourcing manual meter reading will be comparable to the cost of providing manual meter reading services in-house.

As discussed in the response to RCIA IR1 11.1, FEI estimates that outsourced manual meter reading costs would need to increase 18.8 percent from the 2026 outsourced meter reading cost estimate to be on par with the 2027 estimated total cost of in-house manual meter reading. Considering that the current manual meter reading agreement and pricing model would have been in place for over five years at that point, it is not unreasonable to expect a significant price change in order to reflect the changed market and operating conditions. Thus, due to the nature of the shrinking market conditions, FEI concludes that it is reasonable to assume that the outsourced pricing model will compare much more closely to the costs of providing the service in-house in 2027 than it does today.

Please also refer to the response to BCUC IR1 22.1.

22.3 Please discuss the advantages and disadvantages of continuing to outsource meter reading beyond 2027 until these services are no longer available.

Response:

FEI cannot be certain that there will be an option to continue outsourcing beyond 2027. However, if there were, the only advantage is that continuing to outsource provides continuity to customers, delaying any impacts that might result from a transition to in-house meter reading.

There are many disadvantages to continuing to outsource meter reading beyond 2027, even if that would be possible to do, the biggest of which is that FEI faces the increasing risk of being left without a manual meter reading provider (or without a reasonably priced manual meter reading provider) and no alternative in-house manual meter reading or automated solution in place. A transition to in-house manual meter reading would take time, and the longer that FEI continues to outsource manual meter reading, or avoids implementing an automated system, the greater the likelihood that FEI will be required to make a significant, short-term investment in a manual meter

reading solution that is trending toward obsolescence. This would result in unnecessary customer rate impacts while FEI works towards implementing a cost-effective automated solution.

Continuing to outsource manual meter reading services until such time as these services are no longer available leaves FEI and its customers in a vulnerable position. Transitioning to an in-house model is a significant task, requiring time for planning, development, recruiting, and training. To minimize impacts to customers, this is not a transition that should wait until no other options are available.

22.4 At what annual rate does FEI expect the cost of outsourcing meter reading to increase?

Response:

Please refer to the response to BCUC IR1 22.1. Due to the uncertainties associated with the future of manual meter reading, FEI is unable to estimate the cost of increases beyond the negotiated increases currently in place until 2026.

22.5 Please provide revised financial analyses (baseline and incremental) assuming that FEI continues to outsource meter reading until 2031 and 2036, reflecting the expected annual rate increase in outsourcing costs (in line with the preceding IR response). Please include the resulting delivery rate impact and a discussion of any assumptions used.

Response:

As stated in the responses to BCUC IR1 22.1 and 22.4, FEI is unable to estimate the future cost of outsourced manual meter reading post 2026 with any degree of accuracy. However, to provide a directional estimate of the continuation of an outsourced model to 2031 and to 2036, in this response FEI has assumed an annual 2 percent inflation applied to the outsourced meter reading costs. FEI also escalated the cost estimates for in-house meter reading by 2 percent with in-house meter reading then starting in 2032 and 2037. The following table summarizes the resulting impact to the incremental levelized delivery rate.

Levelized Delivery Rate Increase Over 26-Year Analysis Period	Outsourced Meter Reading Until 2027 (As Proposed)	Outsourced Meter Reading Until 2031	Outsourced Meter Reading Until 2036
Baseline	10.223%	10.154%	10.091%
AMI	10.348%	10.348%	10.348%
Incremental	**0.125%**	**0.194%**	**0.257%**
Bill Impact Average Residential Customer consuming 90GJs per Year	**$ 0.56**	**$ 0.88**	**$ 1.16**

22.6 While bringing meter reading in-house in 2027, please clarify whether FEI will incur any costs associated with its contract with Olameter during the transition to in-house meter reading.

Response:

To the extent that FEI would be in a position to bring meter reading in-house in 2027, FEI would not anticipate incurring any costs associated with its contract with Olameter during the transition to in-house meter reading. This is because the current contract between FEI and Olameter expires on December 31, 2026. Assuming FEI commences in-house meter reading on January 1, 2027, the contract with Olameter will naturally expire before this occurs.

Even without these dates aligning, as noted in the response to RCIA IR1 6.1, the contract between FEI and Olameter includes termination provisions that allow either party to terminate the contract by providing 180 days' written notice to the other party.

22.7 Please confirm, or explain otherwise, that the AMI Project will not result in severance payments.

22.7.1 If not confirmed, please provide the estimated severance costs by year and explain whether these costs are included in the AMI and incremental financial analyses.

Response:

FEI does not anticipate that the AMI Project will result in any FEI employee layoffs and, as such, the occasion for potential severance payments by FEI would not arise.

Olameter is responsible for manually reading FEI's meters, and the employees who provide this service are employed by that company. Consequently, Olameter, and not FEI, will be responsible for any notice of termination or payment in lieu that may be provided to its employees.

23.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.2.2, pp. 107–108

AMI Solution – Meter Reading O&M Cost Assumptions

On page 107 of the Application, FEI states: "Based on FBC's experience with electric AMI meters, FEI has included the conservative assumption that 1.5 percent of the AMI meters will have network connectivity issues and will require a manual read."

23.1 Please provide the industry average rate of gas AMI meters that experience network connectivity issues and require a manual reading, including examples from other gas utilities in North America.

23.1.1 Please explain how FEI's assumption used compares to the industry average and other utilities.

Response

FEI is unaware of publicly available AMI network connectivity statistics or an industry average. The estimate for FEI is based on the experience gained through FBC. However, based on information acquired from Util-Assist, FEI understands that it is common for utilities to contract for a connectivity or coverage guarantee in the range of 95 to 99 percent. Thus, in this regard, FEI believes that the estimation of 1.5 percent with network connectivity challenges aligns with industry expectations and the experiences of other utilities, in addition to FBC's experience.

On pages 107 and 108 of the Application, FEI states that it has assumed "FEI's operations field crews will complete 25 percent of the AMI meter reads and the remaining 75 percent will be completed by an outsourced meter reading provider."

23.2 Please discuss the materiality of this assumption for the AMI Project financial analysis and if material, please provide FEI's rationale for this assumption regarding internal and external AMI meter reads.

Response:

The materiality of the assumption operations field crews will complete 25 percent of the manual AMI reads is relatively low as a percentage of total O&M.

The total manual meter reading costs related to AMI meters included in the AMI scenario are an estimated $30 million, or 8.5 percent of the total $352 million AMI O&M. This includes the assumption that 25 percent of AMI meter reads will be completed within the current capacity of the Operations field crews. However, if 100 percent of the manual meter reads of AMI meters were outsourced, total AMI O&M would increase 2.8 percent to $362 million. The 2.8 percent

increase is a relatively small increase in total O&M costs and FEI considers the materiality relatively low.

FEI has included the 25 percent operation field crew assumption in the analysis as this is a financial benefit to the Project and enables FEI to increase operational efficiency of existing resources by reducing idle time.

On page 108 of the Application, FEI states:

> FEI notes that for purposes of the financial analysis, FEI has assumed that 50 percent of the larger commercial and industrial meters will remain on the cellular network as these meters send serial data that will not immediately be available to be received by the head end system.

23.3 Please provide FEI's rationale for the assumption that 50 percent of larger commercial and industrial meters will remain on the cellular network.

Response:

Fifty percent of FEI's large commercial and industrial meters that are currently on a cellular network have been assumed to remain on the cellular network throughout the 26-year analysis period (i.e., including both deployment and post-deployment period) based on FEI's knowledge of the customer type and current meter installations.

These large commercial and industrial meters transfer data that is more complex than the residential and small commercial meters and it is uncertain at this time if the new AMI network will have the initial capability of sending and receiving this complex data. FEI's intention is to transfer over all industrial and commercial meters to the AMI network; however, further work is required to confirm that the proposed AMI network will meet the complex data requirements of these customers.

Because of the uncertainty about the AMI network capabilities in relation to the complex data needs of these larger commercial and industrial meters, FEI chose in the financial analysis to assume the continuation of the cellular costs associated with these meters. FEI notes the cellular costs are immaterial to the costs of the Project, but including these costs in the analysis avoids overstating the financial benefits in this regard.

23.4 Please explain whether this assumption relates only to the deployment phase of the AMI Project.

Response:

Please refer to the response to BCUC IR1 23.3.

24.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.2.2, p. 106

New AMI O&M

On page 106 of the Application, FEI states that new AMI O&M "includes incremental internal labour, AMI network O&M, and AMI software O&M." Further, FEI states:

- **Internal labour**: Consists of an incremental 10 full-time equivalent (FTE) employees including a system engineer, and network and software support personnel. The 10 FTEs will be gradually phased-in primarily over the Deployment phase, reaching 10 FTEs in 2026, the final year of Deployment. In that year, the annual incremental staffing cost is estimated to be $1.4 million. This amount has been escalated by inflation each year in the Post-deployment phase.
- **AMI network O&M**: Consists of the managed network services, radio licenses, backhaul bandwidth, lease costs, and network security. In 2026, the year of full Deployment, the annual network O&M is estimated to cost $4.3 million. This amount has been escalated by inflation each year in the Post-deployment phase. FEI notes that $1.5 million of the cost relating to the managed service is sourced in USD and is subject to foreign exchange.
- **AMI software O&M**: Consists of hosting fees, SaaS fees, license cost, and internal software updates. In 2026, the year of full Deployment, the annual software O&M is estimated to cost $1.9 million. This amount has been escalated by inflation each year in the Post-deployment phase. FEI also notes the hosting and SaaS fees are sourced in USD and are subject to foreign exchange.

24.1 Please confirm, or otherwise explain, that the internal labour cost estimate is based on the estimated number of full-time equivalent employees multiplied by the average labour rate of FEI's employees.

Response:

Confirmed. The internal labour cost estimate is based on the estimated number of full-time equivalent employees at historical fully loaded labour rates, adjusted for inflation.

24.2 Please explain how FEI determined the number of FTE employees required for the AMI Project.

Response:

FEI reviewed the scope of expected sustainment and O&M activities with relevant departments to determine the number of FTE employees required for ongoing work related to the AMI system. In particular, FEI leveraged the experience of FBC to assist in this determination by using past experience to estimate the volume of work for mitigation of field meters, Information Services system upgrades, and the configuration and monitoring of the system.

24.3 Please provide the basis for the AMI network O&M and software O&M costs.

Response:

The bases for the AMI network O&M and software O&M costs are as follows:

- Internal labour – FEI determined that additional positions will be required as a result of new activities that are introduced with the deployment of the proposed AMI Project. These activities include troubleshooting the network in the field, supporting the Information Systems components in the office, developing and executing AMI-related business cases, and managing the associated contracts and leases.
- AMI network O&M – This consists of identified contractual costs for vendor-managed services, estimated site (tower) lease costs based on similar existing FEI and FBC lease costs, estimated radio license fees based on similar systems in other parts of Canada, and estimated bandwidth costs based on existing FEI contracts. Quantities for all the estimates were developed based on a preliminary network design completed by the vendor.
- AMI software O&M – This consists of identified contractual costs for the SaaS environment vendor and estimated internal support costs as discussed in the response to BCUC IR1 16.1.

25.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.2.2, p. 109

Operations O&M

On page 109 of the Application, regarding operations O&M specific to the AMI solution, FEI states:

> The Operations team also identified incremental O&M that would be introduced because of AMI including increased trouble calls, supporting analytics, and redeployed meter exchange activity.107

In footnote 107 on page 109 of the Application, FEI states:

> This is due to the reduction in meter exchange activity that is currently charged to capital, but with AMI could be retained as O&M or could be redeployed to other capital projects. To be conservative, FEI has assumed that the costs would reside in O&M.

25.1 Please discuss whether the accounting treatment of meter exchange activities being retained as O&M is in accordance with US Generally Accepted Accounting Principles, including appropriate references.

Response:

FEI currently allocates a portion (i.e. 14 percent) of the residential meter exchange installation costs to O&M to recognize maintenance activities that are performed in conjunction with the meter exchange and that some of the meter exchanges do not result in an upgrade to the existing meter set assembly (i.e. meter valve, nipples, regulator, and fittings). The majority of the meter exchanges, however, do involve the replacement of substantial portions of the meter set assembly, resulting in an upgrade and extension to the life of the assets with the costs capitalized. This accounting treatment where a portion of the meter exchange activities is considered as O&M is in accordance with US GAAP, since these activities are considered routine maintenance costs which are required to be expensed as incurred. This is consistent with the principles outlined in Accounting Standards Codifications (ASC) 360, *Property, Plant, and Equipment.*

US GAAP is broadly principles based; therefore, the amount of actual guidance to reference is minimal. Instead, FEI has included a reference below from the interpretive guidance released by the international audit and assurance firm Pricewaterhouse Coopers (PwC) which provides a summary of the treatment of maintenance costs under US GAAP. The excerpt is from PwC's May 2021 *Property, plant, equipment and other assets* publication.

Section 1.2.1.4 of PwC's Property, Plant, Equipment and Other Assets Publication

> The in-service stage of long-lived assets begins when the asset is substantially complete and ready for its intended use. Costs during this stage include:

- Repairs and maintenance of existing components
- Replacement of existing components
- Acquisition of additional components

> Costs incurred to acquire additional components of PP&E or replace existing components of PP&E should be capitalized. The costs of normal, recurring, or periodic repairs and maintenance activities and all other costs related to PP&E incurred during this stage should be expensed as incurred. In other words, costs during the in-service stage that extend the existing service potential of the long-lived asset or replace significant components of the long-lived asset should be capitalized. All other costs, including normal repairs and maintenance activities, should be expensed as incurred.

In the post-deployment period, FEI will be following a similar accounting treatment for meter exchange activities where the majority of AMI meter exchange costs will be capitalized with a portion expensed.

With regards to the referenced footnote 107 on page 109 of the Application:

> This is due to the reduction in meter exchange activity that is currently charged to capital, but with AMI could be retained as O&M or could be redeployed to other capital projects. To be conservative, FEI has assumed that the costs would reside in O&M.

FEI clarifies that with the AMI meter deployment through the deployment phase of the Project, there will be a significant decline in the number of meter exchanges expected, freeing up FEI labour resources to do other work. Most of this labour time is expected to be redeployed to support other work (i.e., capital activities). For the labour time with no defined work, FEI has assumed this remains as part of its O&M costs. The accounting treatment of the labour resources retained in O&M is in accordance with US GAAP, assuming these resources will not directly contribute to other capital work. This is consistent with the principles outlined in ASC 360, Property, Plant, and Equipment, and ASC 970-360, which notes that costs must be directly identifiable to a specific project or asset in order to be capitalized, and if not, are expensed as incurred.

25.2 Please provide examples of the accounting treatment used by other gas utilities that use AMI in North America.

Response:

Recognizing that FEI's accounting treatment for meter exchanges is consistent with US GAAP and is FEI's consistent practice for regulatory accounting, FEI has not conducted a search of the accounting treatment of meter exchange activities from other gas utilities that use AMI in North America.

Please refer to the response to BCUC IR1 25.1.

25.3 Please explain how FEI could redeploy the meter exchange activity to other capital projects, including examples if applicable.

Response:

Currently, meter exchange activities are performed by Customer Service Technicians (CSTs). With the reduction in meter exchange activities due to the AMI Project, based on their qualifications, the existing CSTs could be redeployed to perform other activities such as manual meter reading (i.e. radio off customers) and general mains and service construction work.

26.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.3.1.6, pp. 112–113; FortisBC Energy Inc. (FEI) and FortisBC Inc. (FBC) (collectively FortisBC) Application for Approval of a Multi-Year Rate Plan for 2020 through 2024 (MRP Application) Proceeding, Exhibit B-1, pp. D-12, D-25, Exhibit B-1-1, Appendix D2-2, p. 3-13

Depreciation and Net Salvage

In Table 6-8 on page 112 of the Application, FEI provides the depreciation and net salvage rates for the existing asset classes, as well as the proposed rates for the new AMI asset classes, as follows:

Table 6-8: Depreciation and Net Salvage Rates

Rates Used In Analysis	Depreciation	Net Salvage
Baseline Rates (existing approved)		
478-10 / Non AMI Meter Hardware	6.06%	0.00%
474-00 & 474-02 / Meter Installations	5.91%	1.58%
483-20 / GP Computer Software	12.50%	0%
483-10 / GP Computer Hardware	20.00%	0%
484-00 / Vehicles	11.07%	0%
AMI Rates:		
478-12 / AMI Meters	5.00%	0.00%
474-03 / AMI Meter Installation	5.00%	1.58%
402-06 / AMI Software	10.00%	0.00%
488-30 / AMI Communication and Equipment	6.67%	0.00%

On page 112 of the Application, FEI states:

> Depreciation, net salvage, and capital cost allowance (CCA) rates for the asset classes that are relevant to this analysis are those approved in FEI's 2020-2024 MRP Application.
>
> …
>
> FEI proposes the AMI meters and installation costs be added to plant into their own asset class with the depreciation rate set to the manufacturer's useful life estimate for the meters, equalling 5 percent (20 years).

Table D2-10 on page D-25 of the MRP Application shows the recommended depreciation rates for FBC as a result of the 2017 depreciation study, which were approved by the

BCUC.[9] This table includes a depreciation rate of 6.25 % for AMI Meters (line 20 of Table D2-10).

On page 3-13 of Appendix D2-2 FBC Depreciation Study to the MRP Application, regarding FBC's AMI meters, Concentric Advisors ULC states:

> Concentric is relying on industry trends with AMI technology as well as consultations with Company engineering and operations staff to ascertain an estimate of AMI average life. A large piece of AMI service life is based on meter testing prescribed by Measurement Canada.

26.1 Please describe the manufacturer's utility industry experience or Measurement Canada prescribed testing regarding gas AMI meters service life.

Response:

The service life of mechanical diaphragm meters is based on MC prescribed meter testing. The advanced meter life is linked to the device's battery service life. Sensus has determined that the battery installed in the meter will allow the meter to remain in service for 20 years. Sensus has developed this experience related to battery life through its sales of more than 1.4 million units worldwide, over 100 thousand of which are in the North American market.

26.2 Please discuss the factors that were considered in determining that the rate of 6.25 percent for AMI Meters according to the 2017 Depreciation Study was appropriate.

Response:

FEI notes that the 18 year life of the meters was discussed by Concentric in its 2017 Depreciation Study; the 6.25 percent (or approximate 16 year) depreciation rate is higher than the life to adjust for under-recovery of prior years. With reference to the 18 year life, factors that were considered by Concentric in determining in the 2017 Depreciation Study are outlined on page 3-13 of the 2017 FBC Depreciation study[10]:

> There have been no retirements to this account. As a result, a retirement rate analysis cannot be used to estimate a survivor curve. Concentric is relying on industry trends with AMI technology as well as consultations with Company engineering and operations staff to ascertain an estimate of AMI average life. A large piece of AMI service life is based on meter testing prescribed by Measurement Canada. At present, it is assumed that an 18-SQ curve would align

[9] FortisBC Energy Inc. (FEI) and FortisBC Inc. (FBC) Application for Approval of a Multi-Year Rate Plan for the Years 2020 through 2024 Decision and Orders G-165-20 and G-166-20 dated June 22, 2020 (MRP Decision), p. 135.

[10] The 2017 FBC Depreciation Study was filed as Appendix D2-2 in the MRP Application.

with testing intervals and anticipated obsolescence. As retirement and testing data is collected, adjustments can be made to this preliminary estimate. There have been no salvage costs associated with this account and Concentric anticipates no net salvage at this point.

As a result of this review, Concentric recommended adopting a retirement curve for FBC's AMI meters based on 18 years compared to the original estimated life of 20 years when the electric AMI system was first implemented.

26.2.1 Please discuss the applicability of the 6.25 percent depreciation rate used for FBC's AMI meters to FEI's AMI meters and AMI meter installation costs and why this depreciation rate is not proposed in the Application.

Response:

FEI believes the estimated useful life of 20 years is more applicable than the 18 years suggested by the FBC 2017 Depreciation Study for FBC's electric AMI meters. As the gas AMI asset class will be entirely new, for the initial depreciation rate, FEI proposes a 5 percent annual depreciation rate, matching the useful life as provided by the meter supplier and representing the latest information available to FEI. Additionally, the gas AMI meter is covered by a manufacturer's warranty for the replacement cost of a meter for the period of up to 20 years, on a sliding scale basis where after year 10, FEI is responsible for a percentage of the meter replacement cost through the end of year 20. This provides support for the suggested 20-year life by the meter manufacturer. In future depreciation studies, the asset class will be reviewed and changes to the AMI meter depreciation rate will be proposed if warranted.

The FBC electric AMI depreciation rate was developed specifically for FBC's electric AMI meters and reflective of its particular circumstances. FBC's original expected useful life for AMI meters was 20 years. As discussed in the response to BCUC IR1 26.2, Concentric relied on industry trends with AMI technology as well as consultations with FBC's engineering and operations staff to ascertain the estimated AMI meter life used in the depreciation study. The 2017 depreciation study resulted in FBC's depreciation rate being set to 6.25 percent representing the weighted average composite service life remaining for the asset class. The survivor curve (useful life) of the FBC AMI meters is 18-years which, all else equal, would result in a deprecation rate of 5.56 percent (1/18=5.56 percent).

26.2.2 For the AMI and incremental financial analysis, please provide the revenue requirement impact and resulting rate impact each year if the depreciation rate of 6.25 percent was used for both FEI's AMI meters and AMI meter installation costs.

Response:

As stated in the response to BCUC IR1 26.2, the comparable life estimate for the FBC electric meters is 18 years, which equals a depreciation rate of 5.56 percent.

FEI has rerun the financial analysis with the 5.56 percent depreciation rate for both the AMI meter and installation costs. Using a depreciation rate of 5.56 percent for both the AMI meter and installation costs results in the levelized delivery rate impact of the AMI Project compared to the Baseline increasing to 0.129 percent from 0.125 percent.

As requested, FEI provides the following table summarizing the revenue requirement and delivery rate impact of the change to a 5.56 depreciation rate for each year in the analysis period.

5.56% Depreciation	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenue Requirement Impact $millions	-	-	0.0	0.5	1.5	2.4	2.8	2.6	2.5	2.4	2.2	2.1	2.0
Rate Impact	0.00%	0.00%	0.00%	0.06%	0.17%	0.27%	0.31%	0.30%	0.28%	0.27%	0.25%	0.24%	0.22%
	2034	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**
Revenue Requirement Impact $millions	1.8	1.7	1.5	1.4	1.2	1.1	0.9	0.7	(5.1)	(15.4)	(20.2)	(15.0)	(4.7)
Rate Impact	0.21%	0.19%	0.17%	0.16%	0.14%	0.12%	0.11%	0.08%	-0.57%	-1.75%	-2.30%	-1.70%	-0.53%

26.3 Please discuss the similarities and differences between FBC's electric AMI meters and FEI's proposed AMI meters that would impact their useful life.

Response:

The following is a discussion of the similarities and differences between FBC's electric AMI meters and FEI's proposed gas advanced meters that may impact their useful life.

Similarities:

Both gas advanced meters and electric AMI meters are digital technologies that use software to perform measurement calculations. Both types of meters have integrated wireless communications, provide for remote disconnect, and support advanced analytic capabilities. Also, common to both meters is that as new technology is introduced, such as upgrades to the software and firmware by manufacturers, older platforms may be phased out and impact the useful life of the AMI meter.

Differences:

Gas advanced meters typically have warranty coverage for up to 20 years, and electric AMI meters typically have warranty coverage for five to ten years. Gas advanced meters rely on a battery as the sole power source which ultimately limits the meters' useful life. Electric meters are line powered, which provides a continuous supply of power to the meter for metering and communications purposes.[11]

Overall, software life and general obsolescence are the primary factors that impact an AMI meter lifespan for both gas and electric meters. In the case of the battery life affecting use of an AMI meter, it is particularly relevant for gas AMI meters as it is the sole power source.

26.4 Please explain whether FEI has considered any alternative depreciation rates and/or net salvage rates for the new AMI asset classes. If not, please explain why not.

26.4.1 If yes, please discuss the alternative depreciation and/or net salvage rates considered by FEI, including the advantages and disadvantages of each and please explain why each alternative was rejected.

Response:

Recognizing that the majority of the proposed Project capital spend is for the installation and purchase of new AMI meters and also that an estimated useful life and related depreciation rate based on the manufacturer's estimate is reasonable and appropriate, FEI did not consider alternative depreciation rates and/or net salvage rates for the new AMI classes. In addition, depreciation studies were recently completed for FEI and FBC's assets, including reviewing the existing meters as part of the Companies' MRP Application. As a result, FEI did not undertake any further efforts at this time, such as engaging an external consultant to review specifically the estimated useful life and recommended depreciation rates for the Gas AMI equipment.

For the AMI meters and AMI meter installation costs, please refer to the response to BCUC IR1 26.2.1 for discussion of why using the meter manufacturer's estimate of the useful life is appropriate.

For the AMI Software and Communication and Equipment, please refer to the response to BCUC IR1 26.6 for discussion of the similarities between FEI's AMI system and the FBC's AMI system, and why it is reasonable and appropriate to use FBC's existing depreciation rates.

A new FEI depreciation study is expected to be completed before the majority of the FEI assets will be in service and the recommended depreciation rates will be reviewed and confirmed at that

[11] Electric AMI meters have a battery to maintain only the internal date/time clock during outages or while unpowered in storage.

time. Please refer to the response to BCUC IR1 26.10 for discussion of the expected timing of the next depreciation study.

Table D2-3 on page D-7 of the MRP Application shows the recommended depreciation rates for FEI as a result of the 2017 depreciation study, which were approved by the BCUC. This table includes a depreciation rate of 25% for asset class 483-10 / GP Computer Hardware (line 73 of Table D2-3).

26.5 Please reconcile the baseline depreciation rate for asset class 483-10 / GP Computer Hardware in Table 6-8 in the preamble (20 percent) and in the 2017 depreciation study (25 percent).

Response:

Please refer to the response to BCUC IR1 21.8.

26.5.1 If appropriate, please provide the updated baseline and incremental financial analysis and resulting rate impact each year to account for this rectification.

Response:

Please refer to the response to BCUC IR1 21.8.

On pages 112 and 113 of the Application, FEI states: "FEI also notes the proposed new rates for AMI software and AMI Communication and Equipment have been assumed to be equivalent to the rates FBC uses for similar assets."

26.6 Please discuss the rationale for assuming the depreciation rates for FEI's proposed new AMI software and AMI Communication and Equipment will be equivalent to the rates used by FBC for similar assets.

Response:

As much of the proposed AMI software and Communication and Equipment for FEI's AMI system will be similar to that used by FBC's AMI system (and hence will have comparable expected

lifespans), it is reasonable and appropriate to use the existing FBC depreciation rates for those similar assets. A new FEI depreciation study is expected to be completed before the majority of the FEI assets will be in service and the recommended depreciation rates will be reviewed and confirmed at that time.

26.6.1 Please discuss the similarities and differences between FBC's electric AMI software and AMI Communication and Equipment and FEI's proposed AMI software and AMI Communication and Equipment that would impact their useful life.

Response:

The AMI Communication and Equipment being proposed as part of FEI's AMI Project is similar to that used on the FBC electric AMI project. The major difference is that the base stations proposed for the FEI AMI Project will be installed on tower and building infrastructure, whereas in the FBC installation they were installed on utility power poles. However, this difference does not affect their useful life.

There are no appreciable differences in any software that FEI will be using on its proposed AMI Project compared to FBC's AMI system that would impact its useful life.

26.7 Please identify other gas utilities across North America that have implemented AMI technology.

Response:

Please refer to Appendix A in Exhibit B-1-1, the Util-Assist Report, which provides details of natural gas advanced meter infrastructure (AMI) and automated meter reading (AMR) projects across Canada and the U.S. Section 2.1 of the report provides a chart summarizing a selection of the larger gas AMI and more recent AMR projects in Canada and the United States.

Larger deployments of AMI technology for gas utilities include:

- SoCalGas (Southern California) – 6 million gas AMI modules;
- Pacific Gas and Electric (PGE California) – 4.4 million gas AMI modules;
- Nicor Gas (Illinois) – 2.2 million gas AMI modules; and
- Cons Edison (New York) – 1.3 million gas AMI modules.

26.7.1 For those gas utilities identified with AMI technology, please identify the expected and actual (where available) service life of the AMI assets and please discuss any similarities and differences with the technology that is proposed to be used by FEI.

Response:

Statistics on actual service life of assets deployed at other gas utilities is not publicly available. In general, the expected service life for AMI assets is 15-20 years, and this period can be covered by the manufacturers' warranties. The newest residential gas AMI meters, such as those proposed by FEI for deployment, have expected 20-year service lives and have available warranties covering this service life.

26.7.2 Please discuss whether FEI considered the experiences of other natural gas utilities in developing the proposed depreciation rates for the FEI AMI assets. If yes, please discuss how this has been incorporated into the proposed depreciation rates. If not, please discuss why not.

Response:

No, FEI did not consider the experiences of other natural gas utilities in developing the proposed depreciation rates for the FEI AMI assets. As provided in Section 6.3.1.6 of the Application, FEI based the depreciation rates for the FEI AMI assets on the manufacturer's useful life estimate for the meter hardware and installation, and used FBC's approved depreciation rate for similar software and AMI communication equipment.

Please refer to the response to BCUC IR1 26.4 on why FEI did not consider any alternative depreciation rates and/or net salvage rates for the new AMI asset classes.

Further on page 112 of the Application, FEI states: "The net salvage rate for AMI meters (to recover the costs of removal over the lives of the meters) has been set equal to that of existing meters with the expectation that the costs of removal will be similar."

26.8 Please explain FEI's rationale for the assumption that removal costs for the AMI meters will be similar to that of existing meters.

Response:

FEI used existing net salvage values, as there is no difference in the expected level of effort or resources to remove a diaphragm versus an AMI meter. FEI notes future depreciation studies will review and update rates if needed, but for the purposes of the analysis in the Application, FEI has used the existing net salvage rates.

Table D2-4 on page D-12 of the MRP Application shows the recommended net salvage rates for FEI as a result of the 2017 depreciation study, which were approved by the BCUC. This table includes a net salvage rate of 3.37% for asset class 474-00 (meter installations). BCUC Staff did not identify asset class 474-02 (meter installations since January 2012 [12]) on this table.

26.9 Please explain how the net salvage rate of 1.58 percent for AMI meter installations was computed.

Response:

FEI's current assets related to house regulators and meter installations are reported in two asset classes. For purposes of analyzing the Baseline and AMI scenarios, FEI has grouped these two asset classes and used a weighted net salvage rate based on the 2020 ending plant values.

The net salvage rate of 1.58 percent for AMI meter installations was computed as the weighted average rate of asset accounts 474-00 House Regulators & Meter Installations and 474-02 Meters/Regulators Installations. The following table provides the weighted average salvage rate between these two accounts. The weighted average rate is calculated based on $5,747 thousand from the table divided by $364,088 thousand, which equals 1.58 percent.

Plant Asset Account	2020 Ending Gross Plant for Depreciation ($000's)	2021 Net Salvage Rate[1]	Calculation Result[2] ($000's)
474-00 House Regulators & Meter Installations	170,544	3.37%	5,747
474-02 Meters/Regulators Installations	193,544	0%	-
Total	**364,088**		**5,747**

Notes:

[1] As shown in Table D2-4 of the MRP Application and approved by Order G-165-20

[2] 2020 Ending Gross Plant for Depreciation x 2021 Net Salvage Rate

[12] Exhibit B-1, p. 112, footnote 119.

On page 113 of the Application, FEI states:

> "FEI has used these rates for the purposes of the financial analysis and requests approval of these rates in this Application, but notes that a new depreciation study is expected to be filed before the majority of the assets are in service, and these rates will be reviewed and confirmed at that time."

26.10 Please provide the current status and expected completion date of the referenced depreciation study and discuss whether there are any results that have informed the depreciation rates and/or net salvage rates proposed in the Application.

Response:

The next depreciation study is expected to commence in 2023 and be completed by 2024. As such, no results from the future study have informed the depreciation and net salvage rates proposed in this Application.

27.0 Reference: PROJECT COSTS

Exhibit B-1, Section 1.3.3, p. 9; Section 6.3.2.2, p. 113

AMI Application and Feasibility Cost Deferral Account

On page 9 of the Application, FEI requests approval to create the following deferral account:

- A non rate base AMI Application and Feasibility cost deferral account attracting a weighted average cost of capital (WACC) return until it is placed into rate base, to capture development and application costs for this Project. Once transferred to rate base FEI proposes an amortization period of three years.

On page 113 of the Application, FEI states:

> FEI expects to incur costs of approximately $9.9 million, inclusive of the preliminary project planning, application development and regulatory proceeding costs, as well as costs associated with additional public communications and consultations. Upon approval of the AMI Project FEI will transfer the balance to rate base and proposes to amortize the costs accrued to this account over three years beginning in 2023.

27.1 Please provide a breakdown of the $9.9 million forecast development and application costs by cost category and year, forecast and actual costs incurred.

Response:

While preparing this IR response FEI noted that $9.9 million was inadvertently misreported in the Application in Section 6.3.2.2, page 113, line 22. The amount should have been reported as $10.5 million. The correct amount of $10.5 million was used in the financial model. This change has been filed in the errata filed concurrently with FEI's responses to Information Request No. 1.

FEI provides the following table showing the breakdown of the $10.5 million forecast development and application costs by category and year. FEI notes pre-2021 costs represent actual spend and 2021 to 2025 represent forecast costs.

AMI Application & Feasibility Cost Deferral Additions ($millions)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Labour	0.0	-	0.0	0.1	0.3	0.9	2.0	-	-	-	-	3.4
Consulting, Legal, Regulatory	0.1	0.0	0.2	0.6	0.7	0.4	2.1	1.6	0.3	0.2	0.2	6.5
Misc. Expenses	0.0	(0.0)	0.2	0.0	0.1	0.0	0.2	-	-	-	-	0.6
Total	**0.1**	**0.0**	**0.3**	**0.8**	**1.2**	**1.4**	**4.3**	**1.6**	**0.3**	**0.2**	**0.2**	**10.5**

27.1.1 Please identify if the breakdown of $9.9 million forecast development and application costs include any costs that would typically be capitalized for accounting purposes. If yes, please explain why these costs will not be capitalized with the AMI Project.

Response:

The $10.5 million (corrected from $9.9 million in the response to BCUC IR1 27.1) forecast development costs is a subset of the total Project Management costs. In accordance with US GAAP, FEI determined Project costs prior to CPCN approval as well as all costs incurred for the development of the Application and the associated regulatory process (i.e. including legal, BCUC costs, intervener costs, etc.) would be captured by the proposed AMI Application and Feasibility Cost deferral account. As such, these costs are not capitalized.

27.1.2 Please explain whether any of the forecast or actual development and application costs that FEI proposes to record in the deferral account are included in FEI's revenue requirements used to set approved delivery rates. If yes, please provide a breakdown by year and cost category.

Response:

All actual and forecast deferral costs as shown in Table 6-4 of the Application are recorded in the non-rate base AMI Application and Feasibility deferral account with no amortization. As such, the recovery of the costs has not been included in FEI's Annual Reviews for setting the annual delivery rates. As proposed in Section 6.3.2.2 of the Application, once the CPCN is approved, FEI will transfer the non-rate base deferral account to rate base and begin amortization over a three-year period to recover these development and application costs in FEI's delivery rates.

27.2 In the event that the AMI CPCN is not granted, please discuss whether these development and application costs will continue to be used and useful.

Response:

FEI notes that the "used and useful" concept is generally applied to physical assets and not to deferral accounts. Regardless, FEI provides the following response.

The application development, regulatory proceeding costs, and costs associated with public communication and consultations intended to be captured by the proposed AMI Application and Feasibility Cost deferral account are prudently incurred as they are reasonable and necessary for

the preparation of the CPCN application. These costs are used and useful for FEI to prepare and file the CPCN application as well as to manage the subsequent regulatory process, including BCUC costs and intervener costs. These costs are consistent in nature with the costs of preparing and developing past CPCN applications which have been granted similar deferral treatment by the BCUC. As such, the deferral treatment of these application and feasibility costs should be approved as filed regardless of whether the CPCN is approved or not. Absent BCUC approval on the deferral treatment of these costs (regardless of whether the AMI CPCN is granted or not), these costs would be expensed as a flow-through item.

27.3 If the AMI CPCN is not granted, please clarify, with rationale, whether FEI's recovery mechanism would remain the same and please provide the incremental delivery rate impact by year for the write-off of the AMI Application and Feasibility cost deferral account.

Response:

As discussed in the response to BCUC IR1 27.2, the AMI Application and Feasibility costs are prudently incurred and are necessary for the preparation of the CPCN application as well as to manage the costs of the subsequent process. The deferral treatment of these costs should be approved as filed regardless of whether the CPCN is approved or not; therefore, there would be no change to the proposed recovery mechanism of these costs.

The following table summarizes the estimated delivery rate impact by year when compared to the 2021 approved delivery rates based on a three-year amortization period as proposed and the 2022 forecast ending balance of the deferral account.

	2023	2024	2025
Incremental Delivery Rate % Increase	0.454%	-0.022%	-0.022%

27.4 Please provide FEI's rationale for the three-year amortization period for this AMI Application and Feasibility cost deferral account.

Response:

The following response also addresses BCUC IR1 27.5 and 27.6.

FEI used an amortization period of three years, which is consistent with recent BCUC approvals for FEI's CPCN applications:

- BCUC Order C-2-21 for the Pattullo Gas Line Replacement Project approved a single Application and Preliminary Stage Development Costs deferral account with a three-year amortization period;
- BCUC Order G-12-20 for the Inland Gas Upgrades Project approved a single Application and Preliminary Stage Development Costs deferral account with a three-year amortization period;
- BCUC Order C-11-15 for the Lower Mainland Intermediate Pressure System Upgrade Project approved two separate deferral accounts for the Application and Project Development costs, both with three-year amortization periods; and
- BCUC Order C-2-14 for the Muskwa River Crossing Project for the Fort Nelson Service Area approved a single Application and Project Development Cost deferral account with a three-year amortization period.

The following table summarizes the levelized annual delivery rate impact in $/GJ and the levelized annual bill impact for a residential customer with an average consumption of 90 GJs per year for each of the amortization periods of one, two, and three years.

	Amortization Period		
	1 Year	2 Year	3 Year
Levelized Annual Delivery Rate Impact ($/GJ)	0.012	0.011	0.010
Levelized Annual Bill Impact for Residential Customer, 90GJs ($)	**1.10**	**0.98**	**0.90**

The difference in terms of bill impact to FEI's ratepayers is small between the various amortization periods. As such, FEI considers that there is no basis to deviate from prior practice and a three-year period is consistent with previous applications.

27.5 Please discuss whether any alternative amortization periods were considered by FEI. If not, please explain why not.

27.5.1 If yes, please discuss these alternatives, including the advantages and disadvantages of each and why each alternative was rejected.

Response:

Please refer to the response to BCUC IR1 27.4.

27.6 Please provide the incremental annual delivery rate impact if the deferral account is amortized over a one-year period and a two-year period, respectively.

Response:

Please refer to the response to BCUC IR1 27.4.

28.0 Reference: PROJECT COSTS

Exhibit B-1, Section 1.3.3, p. 9; Section 6.3.1.4, p. 111; Section 6.3.2.3, p. 114

AMI FX Mark to Market Deferral Account

On page 9 of the Application, FEI requests approval to create the following deferral account:

- A non rate base AMI Foreign Exchange (FX) Mark to Market Valuation deferral account to isolate the impact of any foreign exchange hedging used to reduce foreign exchange risk of the Project.

On page 111 of the Application, FEI states:

> The foreign exchange rate used in the analysis is 1.33 USD/CAD for any costs denominated in USD. The exchange rate used was the spot rate at October 31, 2020. FEI notes the current spot USD/CAD rate is 1.23 at time of filing, but FEI has conservatively used the higher 1.33 rate.

28.1 Please clarify whether the FX rate of 1.33 USD/CAD used in the financial analysis is based on the expected rate FEI expect to lock in at when entering FX contracts. If not, please provide the rationale for the FX rate of 1.33 USD/CAD used in the financial analysis and please provide the forecast FX rate FEI expects to lock in when using FX contracts.

Response:

The foreign exchange rate of 1.33 USD/CAD used in the financial analysis is not the expected rate FEI expects to lock in when entering any foreign exchange contracts. The rationale for using the 1.33 USD/CAD rate is that this was the spot rate during the period when the majority of the analysis of the Project was completed. Foreign exchange rates are outside of FEI's control and FEI has not attempted to speculate what the future foreign exchange rate will be. FEI acknowledges in the Application that the spot rate reduced to 1.23 USD/CAD at time of filing, but conservatively used the higher rate of 1.33 USD/CAD in the analysis. Upon Project approval and finalizing the procurement of materials and services sourced in USD, FEI will evaluate foreign exchange rates at that time and determine if hedging any of these USD costs is appropriate.

28.2 If FEI did not mitigate FX risk by using FX contracts, please provide the forecast FX rate FEI would use in the financial analysis.

Response:

Please refer to the response to BCUC IR1 28.1.

On page 114 of the Application, FEI states: "FEI may mitigate a portion of the risk by locking in foreign exchange rate exposure using FX Contracts to mitigate the risk of fluctuations in the value of USD/CAD currency exchange rate."

28.3 Please provide the amount and percentage of costs FEI expects to hedge using FX contracts and the remaining portion of costs that may be subject to FX risk. Please discuss the likelihood that FEI will use FX hedging to reduce the FX risk of the Project.

Response:

Any hedging strategy implemented by FEI will be based on an overall assessment of the degree of underlying FX risk along with an assessment of the cost and effectiveness of a hedging strategy.

At this time, FEI does not expect to implement a comprehensive FX hedging strategy regarding AMI's FX exposure, but may employ shorter-term instruments such as one to three month fixed currency swaps when the exact timing and amount of USD payments are known through invoicing and more precise vendor estimates.

Preliminary high-level estimates of the total USD exposure for the AMI Project is approximately $250 million USD.

Contract negotiation with suppliers is ongoing and exposure may change as these are finalized. Further, some contracts also contain exposure to the EUR or underlying commodity costs through price adjustment clauses.

28.4 Please provide a sensitivity analysis on the AMI Project costs if the FX rate changed by +/- 2%, including the resulting dollar impact and rate impact for each year of the 26-year analysis period.

Response:

FEI analyzed the sensitivity of increasing and decreasing the 1.33 USD/CAD foreign exchange rate used in the Application by two percent. Table 1 below summarizes the incremental levelized delivery rate impact associated with the foreign exchange sensitivity over the 26-year period when compared to the 2021 approved delivery rates.

Table 1: Sensitivity Analysis of Incremental Levelized Delivery Rate Impact with FX Rate +/- 2%

Scenario	USD/Rate	Incremental Levelized Delivery Rate Impact
USD/CAD - 2%	1.30	0.078%
Application	1.33	0.125%
USD/CAD + 2%	1.36	0.171%

An increase of two percent to the foreign exchange rate used in the Application will change the incremental levelized delivery rate impact from 0.125 percent to 0.171 percent when compared to the approved 2021 delivery rate. A decrease of two percent to the foreign exchange rate will change the incremental levelized delivery rate impact from 0.125 percent to 0.078 percent.

Please refer to Tables 2, 3, and 4 below for the annual incremental revenue requirement and the annual incremental delivery rate impact of each scenario over the 26-year period when compared to the 2021 approved delivery rates.

Table 2: Incremental Revenue Requirement and Delivery Rate Impact by year when compared to 2021 Approved Delivery Rate for USD/CAD -2%

USD/CAD -2%	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental Revenue Requirement - $millions	-	(4.8)	1.5	13.0	30.7	41.1	41.4	35.9	26.8	14.9	5.7	0.8	(2.9)
Incremental Delivery Rate Impact - %	0.0%	-0.5%	0.2%	1.5%	3.5%	4.7%	4.7%	4.1%	3.0%	1.7%	0.6%	0.1%	-0.3%
	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Incremental Revenue Requirement - $millions	(8.6)	(15.2)	(20.1)	(22.9)	(24.4)	(26.4)	(29.6)	(32.7)	(36.6)	(38.0)	(42.2)	(50.3)	(58.4)
Incremental Delivery Rate Impact - %	-1.0%	-1.7%	-2.3%	-2.6%	-2.8%	-3.0%	-3.4%	-3.7%	-4.2%	-4.3%	-4.8%	-5.7%	-6.6%

Table 3: Incremental Revenue Requirement and Delivery Rate Impact by year when compared to 2021 Approved Delivery Rate for USD/CAD as per Application

Application	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental Revenue Requirement - $millions	-	(4.8)	1.5	13.1	31.1	41.7	42.1	36.6	27.5	15.5	6.3	1.5	(2.3)
Incremental Delivery Rate Impact - %	0.0%	-0.6%	0.2%	1.5%	3.5%	4.7%	4.8%	4.2%	3.1%	1.8%	0.7%	0.2%	-0.3%
	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Incremental Revenue Requirement - $millions	(8.0)	(14.7)	(19.6)	(22.4)	(23.9)	(26.0)	(29.2)	(32.3)	(36.3)	(37.7)	(42.0)	(50.1)	(58.3)
Incremental Delivery Rate Impact - %	-0.9%	-1.7%	-2.2%	-2.5%	-2.7%	-3.0%	-3.3%	-3.7%	-4.1%	-4.3%	-4.8%	-5.7%	-6.6%

Table 4: Incremental Revenue Requirement and Delivery Rate Impact by year when compared to 2021 Approved Delivery Rate for USD/CAD +2%

USD/CAD +2%	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental Revenue Requirement - $millions	-	(4.9)	1.4	13.3	31.5	42.4	42.9	37.4	28.2	16.2	7.0	2.1	(1.7)
Incremental Delivery Rate Impact - %	0.0%	-0.6%	0.2%	1.5%	3.6%	4.8%	4.9%	4.2%	3.2%	1.8%	0.8%	0.2%	-0.2%
	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Incremental Revenue Requirement - $millions	(7.4)	(14.2)	(19.1)	(21.9)	(23.4)	(25.5)	(28.8)	(31.9)	(35.9)	(37.3)	(41.7)	(50.0)	(58.3)
Incremental Delivery Rate Impact - %	-0.8%	-1.6%	-2.2%	-2.5%	-2.7%	-2.9%	-3.3%	-3.6%	-4.1%	-4.2%	-4.7%	-5.7%	-6.6%

Further, on page 114 of the Application, FEI states:

> The deferral account will not attract a financing return, as the mark-to-market adjustments are non- cash.
>
> The deferral account treatment of the mark-to-market adjustments related to the foreign exchange rate hedging for the Project will have no impact on customer rates. The use of the requested deferral account will not increase or decrease the expected cost of the Project because the hedging provides more certainty on the exchange rate for the USD denominated cost components and thus mitigates the foreign exchange risk upon settlement, or payment. The FX Contracts will provide increased cost certainty as they lock in the foreign exchange rates for USD denominated cost components obtained by FEI for this Project. At the end of the Project, the amount of the deferral account will be zero, since the deferral account only captures any unrealized gains and losses related to the requirement to mark-to-market the FX Contracts.

28.5 Please confirm, or explain otherwise, that in addition to having no impact on customer rates nor attracting financing return, the AMI FX Mark to Market deferral account will not result in any incremental costs or revenue requirement impacts.

Response:

Confirmed.

28.6 Please discuss the potential impact to FEI and its ratepayers if the deferral account is not approved.

Response:

If the deferral account is not approved and the utility were to still enter into foreign currency forward contracts related to the construction of the Project, mark-to-market adjustments on the forward contracts would have no impact on ratepayers, as they are treated as a non-regulated item.

Alternatively, if the deferral account is not approved, FEI could choose not to enter into foreign currency forward contracts related to the construction of the Project, thereby eliminating the need to record mark-to-market adjustments. This would create foreign exchange risk for ratepayers on the total Project costs that would ultimately end up in rates at the completion of the Project.

Ultimately, the use of the regulatory account ensures the fair treatment of both customers and FEI.

28.7 Please discuss whether FEI would hedge its USD denominated payments for the AMI Project if the deferral account is not approved. Please explain why or why not.

Response:

If the deferral account is not approved, FEI would continue to consider the benefits and risks in utilizing a currency risk management strategy. The decision to utilize currency hedging strategies is based on a comprehensive risk assessment of the FX risk along with a determination of the cost and effectiveness of a hedging strategy, and not based on any single consideration.

28.8 Please discuss whether there would be any issue with the BCUC directing this account to be closed at the end of the AMI Project in year 2027, when the deferral account balance will be zero.

Response:

FEI would not have an issue with the BCUC directing that the account be closed at a point when the deferral balance will be zero; however, as the account is intended to be used until the completion of the Project's construction period, if the construction timeline is delayed or extended, the deferral account balance may not be zero at the end of 2027. In this scenario, the account would need to remain open until the completion of construction. Therefore, if the BCUC were to direct the closure of the deferral account, FEI recommends that the closure be tied to the completion of Project construction and final payments and not a specific year.

29.0 Reference: PROJECT COSTS

Exhibit B-1, Section 1.3.3, p. 9; Section 6.3.2.4, pp. 115; FortisBC Inc. Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project decision and Order C-7-13 dated July 23, 2013 (FBC AMI CPCN Application Decision), p. 98

Existing Meter Cost Recovery Deferral Account

On page 9 of the Application, FEI requests approval to create the following deferral account:

- A rate base Existing Meter Cost Recovery deferral account to capture the remaining rate base value of meters to be exchanged as part of this Project with a rolling amortization period of five years.

On page 115 of the Application, FEI states that it has considered two options for the recovery period of the remaining rate base value of the existing meters, as follows:

> The first option would be to amortize the account over a 5-year period, and the second to amortize the account over a 10-year period. The 5-year amortization period is consistent with the BCUC's decision for the recovery of the remaining costs of FBC's existing electric meters as determined by Order C-7-13 in FBC's AMI CPCN Application. The 10-year amortization period is based on the estimated remaining life of the existing meters as determined in the 2017 Depreciation Study approved as part of FEI's 2020-2024 MRP Application.
>
> …The estimated remaining rate base value of FEI's gas meters to be transferred to the deferral account and amortized over 5 years is approximately $79 million.

29.1 Please discuss if these existing meters would have any possible future use for FEI after the deployment of the AMI meters.

Response:

FEI has not identified a use for the existing meters post-AMI implementation. As such, the metal from the existing meters will be recycled and the value of the scrapped metal will be used to offset deployment costs.

29.2 Please clarify if the $79 million includes any existing net salvage accruals related to the current meters. If yes, please provide the amount. If not, please explain why not and provide the amount of any existing net salvage accruals for the current meters.

29.2.1 Please clarify if the $79 million includes any expected net salvage amounts (i.e. salvage value and/or disposal costs) that are not presently included in FEI's existing net salvage accruals. If so, please explain why and provide the amount.

Response:

The $79 million does not include any existing or expected net salvage amounts related to the current meters. The $79 million is the expected remaining undepreciated value of the meter hardware and installation related to the current in-service gas meters and does not include historical losses or any net salvage.

The 2020 actual net salvage balance for asset account 474-00 house regulators and meter installations is $4.8 million. This net salvage provision is maintained for the entire asset class and will be used in the future for the ultimate removal of assets from the class, with future net salvage rates adjusted through depreciation studies to account for any over- or under-provision.

29.3 Please provide details of FEI's regulatory accounting policy to account for net salvage for the existing meters.

Response:

FEI's regulatory accounting policy to account for net salvage for assets including existing meters is based on the traditional method to recover the negative salvage values from ratepayers which was approved by the BCUC in Order G-44-12 dated April 12, 2012.[13] Under the traditional approach, FEI's depreciation rates in the depreciation study for its assets including existing meters, incorporate a provision for the estimated salvage rate. The estimated salvage rates are reviewed as part of the depreciation study completed every three to five years to ensure appropriateness.

The collected negative salvage amounts along with the actual salvage costs (i.e. costs net of salvage proceeds) for FEI's different asset classes are captured in a net salvage deferral account. The net salvage deferral account serves as a reduction to FEI's overall rate base. Details of the deferral account are provided annually in the Net Salvage Continuity schedule – page 10 of the FEI Annual Report to the BCUC.

[13] In the matter of an Application by the FortisBC Energy Utilities (comprising FortisBC Energy Inc., FortisBC Energy Inc. Fort Nelson Service Area, FortisBC Energy (Whistler) Inc., and FortisBC Energy (Vancouver Island) Inc.) for Approval 2012-2013 Revenue Requirements and Rates.

29.4 Please discuss the advantages and disadvantages of amortizing the Existing Meter Cost Recovery deferral account over ten years as compared to five years and please provide the resulting rate impact if a 10-year period was selected in a revised incremental financial analysis.

Response:

Increasing the amortization period of the proposed Existing Meter Cost Recovery deferral account from five years to ten years would result in a small increase to the incremental levelized delivery rate impact over the 26-year analysis period by 0.002 percent from 0.125 percent to 0.127 percent. This increase is primarily due to the increased rate base return on the deferral account for a longer period of time, which offsets the lower annual amortization expense due to a longer amortization period.

From a ratepayer perspective, the advantage of amortizing the proposed Existing Meter Cost Recovery deferral account over ten years versus five years would be the lower annual amortization expense in the delivery rates in the short term. A longer amortization period will help to smooth out the initial incremental delivery rate increase due to the AMI Project. For instance, with a five-year amortization period, the incremental delivery rate increase due to the AMI Project will peak at 4.8 percent while the incremental delivery rate increase would peak at 3.7 percent if a ten-year amortization period is used.

However, as mentioned above, the disadvantage of increasing the amortization period to ten years would be a higher incremental delivery rate impact over a long term (i.e., 26-year analysis period) due to having ten years of rate base return on the balance of the deferral account rather than five years.

29.4.1 Please explain FEI's rationale for rejecting the 10-year amortization period.

Response:

FEI proposes a five-year amortization period for the recovery of the remaining value of existing meters (i.e., not a ten-year amortization period) based in part on the precedent established in the FBC AMI Application proceeding where the BCUC decided that a five-year amortization for the remaining value of the meters retired due to AMI was appropriate. A five-year amortization period is also generally more consistent with the timeframe of the Gas AMI Project costs, with the expected duration of the Project expected to be four years (2023 – 2026) and the proposed amortization period of three years for the AMI Application and Feasibility Cost deferral account. FEI believes a five-year amortization period provides a reasonable timeframe for the recovery of the invested capital related to existing meters retired as a result of the AMI Project. As shown in the response to BCUC IR1 29.2, a shorter amortization period would also minimize the impact to

ratepayers by reducing the period of time on which a rate base return is earned on the remaining balance of the deferral account.

For the previously retired meter costs, an amortization period of ten years is more appropriate as it would effectively recover the remaining rate base value over the same time period that would have occurred if there was no AMI Project.

29.5 Please explain FEI's rationale for proposing an amortization period of five years consistent with the BCUC's decision in FBC's AMI CPCN application.

Response:

Please refer to the response to BCUC IR1 29.4.1.

29.5.1 Please discuss the similarities and differences between FEI's existing meters and FBC's electric meters that were replaced by AMI as a result of FBC's AMI CPCN application.

Response:

The following is a discussion of the similarities and differences between FEI's existing gas meters and FBC's electric meters replaced by AMI.

Similarities:

Both meter types utilize mechanical components to determine energy flow, and see the accuracy of measurement degrade as these mechanical components wear over time. In addition, both meters were read manually and had no means for electronic communication (i.e., AMR or AMI). Both meter types also lack any means of automatic shutoff or the ability to store or report data from the meter.

Differences:

FEI's existing diaphragm meter fleet can be affected by pipeline debris as it can cause mechanical components to fail prematurely, whereas mechanical electric meters are more resistant to environmental effects. Temperature compensation required for natural gas measurement in diaphragm meters is accomplished through a series of mechanical components, whereas

electricity consumption measurement is not dependent on ambient temperatures. Finally, gas meters measure energy quantities indirectly and must be adjusted prior to billing[14].

29.6 Please discuss the advantages and disadvantages of recovering the write-off of the existing meters in FEI's delivery rates as compared to the recovery through a separate rate rider or another recovery mechanism.

29.6.1 Please provide a calculation of the impact of recovering the remaining rate base value of existing meters of $79 million, on a standalone basis, from all ratepayers through FEI's delivery rates.

29.6.2 If the $79 million remaining rate base value is recovered from all FEI ratepayers through a separate rate rider, please provide FEI's estimate rate rider.

Response:

Rate riders are normally used when the intent is to recover or return certain costs or revenues from a specific subset of non-bypass customers, whereas amortization into the delivery rates through the proposed deferral accounts is applied to all non-bypass customers.

If the rate rider is applied to all non-bypass customers, then there would be no difference between the recovery from the rate rider and the recovery through amortization in the delivery rates for the remaining rate base value of the existing meters. The following table shows the delivery rate impact in $ per GJ if the amortization is through the delivery rates versus a variable rate rider in $ per GJ. It can be seen that the delivery rate impact through amortization in delivery rates is the same as the variable rate rider.

FEI further notes that although rate riders do not appear on customers' bills as separate line items, there is some administration required both to implement rate riders and to manage them on an ongoing basis. Given this, and that there is no difference to the customer, FEI sees no benefit to adopting a rate rider approach for this recovery.

[14] Gas meters measure the volume of gas delivered to a customer which must then be converted to an equivalent energy quantity.

Amounts in $millions	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Meter Write Off Added to Deferral	19.6	30.7	21.9	7.2					
Deferral Amortization		3.9	10.1	14.5	15.9	15.9	12.0	5.8	1.4
Income Tax and Earned Return on Deferral Ratebase	0.7	3.9	7.6	9.4	9.1	7.9	5.4	2.5	0.6
Total Cost of Service Meter Write Off Deferral	0.7	7.8	17.7	23.9	25.0	23.8	17.4	8.3	2.0
FEI's 2021 Total Non-Bypass Volumes TJs	194,999	194,999	194,999	194,999	194,999	194,999	194,999	194,999	194,999
Estimate Annual Standalone Delivery Rate Impact %	**0.1%**	**0.8%**	**1.1%**	**0.7%**	**0.1%**	**-0.1%**	**-0.7%**	**-1.0%**	**-0.7%**
Estimate Annual Standalone Delivery Rate Impact $/GJ [1]	**$ 0.004**	**$ 0.040**	**$ 0.091**	**$ 0.123**	**$ 0.128**	**$ 0.122**	**$ 0.089**	**$ 0.043**	**$ 0.010**
Required Annual Rate Rider Needed [1]	**$ 0.004**	**$ 0.040**	**$ 0.091**	**$ 0.123**	**$ 0.128**	**$ 0.122**	**$ 0.089**	**$ 0.043**	**$ 0.010**

Note:

[1] *Total Cost of Service Meter Write Off Deferral X 1000 / FEI's 2021 Total Non-Bypass Volumes TJs*

29.7 Given the significant rate base value of FEI's existing meters, please discuss whether FEI considered any alternative project scenarios whereby AMI meters were implemented over a longer period of time as FEI's existing gas meters are removed from service at the end of their useful life. Please discuss the advantages and disadvantages of this option.

Response:

FEI did consider an alternative where existing diaphragm meters would be exchanged with AMI meters following the forecast Baseline meter exchange cycle. The advantage of this scenario is no early retirement of the existing meters would occur with the remaining book value recovered over the expected useful life. The disadvantage of this scenario is FEI would incur similar project management costs and costs to build the network and set up the software, but it would take 18 years to fully deploy the AMI meters. In this scenario, FEI would build a network but it would take many years before the network would be fully utilized. Consequently, the full O&M benefits identified by the Project would not be realized until the 18-year deployment is complete. FEI ultimately decided that in order to achieve the Project needs and operational benefits, a reduced meter deployment schedule based on a 36-month deployment period would be optimal.

30.0 Reference: PROJECT COSTS

Exhibit B-1, Section 1.3.3, p. 9; Section 6.3.2.4, pp. 115–116

Previously Retired Meter Cost Recovery Deferral Account

On page 9 of the Application, FEI requests approval to create the following deferral account:

> • A rate base Previously Retired Meter Cost Recovery deferral account to capture the remaining rate base value of previously retired meters with an amortization period of ten years.

On page 115 of the Application, FEI states:

> …there is approximately $74 million in remaining rate base value for meters previously retired in the normal course of business but that, due to the group asset accounting employed by FEI, had a remaining net book value at the time of retirement. The remaining net book value for these assets resides in accumulated depreciation.

On page 116 of the Application, FEI states that the amortization period of 10 years "is similar to the estimated average remaining life of the existing meters. This would effectively recover the remaining rate base value over the same time period that would have occurred if there were no AMI Project."

30.1 Please explain FEI's rationale for using the estimated average remaining life of the existing meters as the proposed amortization period for the Previously Retired Meter Cost Recovery deferral account, as opposed to some other amortization period.

Response:

FEI's rationale for using the estimated average remaining life of the existing meters as the proposed amortization period for the Previously Retired Meter Cost Recovery deferral account is based on choosing an amortization period that would result in a similar customer rate impact as if there were no AMI Project. This is because the AMI Project does not impact the retirement of previously retired meters, and therefore should not impact the recovery period.

All else equal, the proposed ten-year amortization period for the deferral account is intended to keep the incremental rate impact similar to the rate impact from recovery through depreciation expense of the remaining book value of the previously retired meters. In the event the AMI Project does not proceed, the undepreciated value of meters previously retired would continue to reside in Accumulated Depreciation as part of rate base and be recovered from ratepayers in about ten years, representing the estimated life of the remaining meters.[15] If a different amortization period

[15] Page 5-3 FEI 2017 Depreciation Study – approximate 10 year remaining life of meter related assets is based on estimated remaining life for Asset Class 478.10 of 8.20 years and Asset Class 474.00 of approximately 11 years as

(i.e., higher, lower) is used than the estimated average remaining life of the existing meters, there would then be an increase/decrease in the customer rate impact due to the difference in the recovery period used.

30.2 Please explain whether FEI considered any alternative amortization periods for the proposed Previously Retired Meter Cost Recovery deferral account. If not, please explain why not.

30.2.1 If yes, please discuss the alternative amortization periods considered by FEI, including the advantages and disadvantages of each and please explain why each alternative was rejected.

30.2.2 If yes, please provide the incremental annual rate impact for each alternative amortization period.

Response:

FEI did consider an alternative amortization period for the Previously Retired Meter Cost Recovery deferral account, and that was a matching five-year amortization period of the existing in service meter retirement deferral account.

This five-year amortization was rejected because it effectively escalates the recovery of historical losses and increases the rate impact that would have occurred unrelated to the AMI Project. As detailed in the response to BCUC IR1 30.1, FEI ultimately proposed an amortization period of ten years because that would result in a similar customer rate impact as if there was no AMI Project.

In terms of incremental levelized rate impact over a 26-year period, the difference between a 5-year amortization period and a 10-year amortization period is small, at 0.123 percent and 0.125 percent, respectively. However, the cumulative rate impact in 2027 (the year after full AMI deployment and full non-AMI meter write offs) would peak at 5.83 percent with a 5-year amortization vs. a 10-year amortization peak of 4.79 percent.

30.3 Please explain whether FEI considers it appropriate to amortize the remaining rate base value of the Previously Retired Meter Cost Recovery deferral account over the same period as the proposed Existing Meter Cost Recovery deferral account.

estimated by Concentric.

Response:

Please refer to the responses to BCUC IR1 30.1 and 30.2.

30.4 Please discuss the advantages and disadvantages of amortizing the Previously Retired Meter Cost Recovery deferral account over five years and please provide the incremental financial analysis with the 5-year amortization period and resulting incremental annual rate impact.

Response:

Please refer to the response to BCUC IR1 30.2.

30.5 Please discuss the factors that contributed to the remaining rate base value of $74 million for meters at the time of retirement, including any specifics related to FEI's existing depreciation rates and/or group asset accounting.

Response:

As background on the treatment of retired assets under utility group accounting practices, FEI provides below its response to BCUC IR1 104.1 in the 2020-2024 MRP Application proceeding. It was in this proceeding that FEI's current depreciation rates were approved.

> 104.1 Please explain how FEI currently accounts for gains or losses on retirements. Do these amounts appear in this study?
>
> Response:
>
> Gains and losses resulting from historical assets retirements are recorded as a credit or debit, respectively, in accumulated depreciation for the specific asset class to which they relate. This treatment is discussed in the BCUC Uniform System of Accounts for Gas Utilities pages 17 through 21.
>
> When a depreciation study is conducted on a three to five year cycle, the revised depreciation rates will reflect the unwinding of the difference between the net book value of assets and the value realized at retirement that is embedded in accumulated depreciation. This is accomplished by setting depreciation rates to true up the depreciation reserve, if required. This mass property accounting methodology for gains and losses on retirements is consistent with the group method of depreciation adopted by many utilities (including FortisBC) and is also

discussed on pages 23 through 26 in the BCUC Uniform System of Accounts for Gas Utilities.

In the FEI 2017 Depreciation Study, on pages 5-2 and 5-3 of Appendix D2-1 in the Application, the gains and losses are included in column 5, labelled Book Depreciation Reserve. Note that the majority of the Book Depreciation Reserve is representative of the accumulated depreciation collected in customer rates, with a portion representing gains and losses on retirements. The unwinding of the accumulated gains and losses included in the Book Depreciation Reserve were taken in consideration when the recommended depreciation rates, on pages D-3 to D-7 in Section D2.2.1 of the Application, were developed.

Overall, the review and update of the depreciation rates take into account a number of factors and considerations including adjusting the recommended depreciation rates for the remaining net book value of any retirement losses as described above. In arriving at the recommended depreciation rates (with the assistance of an external depreciation specialist, which is accepted practice for utilities including FEI), the depreciation specialist performs a number of activities. These include reviewing FEI's assets and retirement transactions, conducting operational interviews with FEI staff, and comparing the results to FEI's industry peers. The retirement transactions and any related early retirements (i.e., actual service life versus original estimated service life) help to inform the decision on the estimated remaining useful life, which affects the proposed depreciation rates.

Factors contributing to the retirement losses related to meters have been Measurement Canada requirements for meter testing resulting in the shortening of the meter life to less than 20 years. In 2011, Measurement Canada introduced a more stringent meter testing specification. The new specification placed increasingly strict criteria on meter testing making it more likely that meters would fail as they aged. This is especially true for mechanical meters with moving parts. The implementation of the new Measurement Canada requirements contributed to residential meters being retired before they reach 20 years of age and to the shortening of the estimated meter life used for setting the depreciation rate. Prior to this, the estimated meter life was approximately 25 years.

The depreciation rates are then adjusted to factor in the recovery of any existing retirement losses (or gains) that may be included in the accumulated depreciation account balance over the remaining lives of the existing assets and the final depreciation rates are subject to review by the utility's regulator. Recommendations for revised depreciation rates are not designed to recover existing "loss" balances all at once. Under FEI's approved group accounting method, depreciation rates are designed to recover existing amounts of unrecovered depreciation over the remaining service lives of the assets that remain in the asset class.

31.0 Reference: PROJECT COSTS

Exhibit B-1, Section 1.2.3, p. 7; Section 6.3.1, p. 111; Section 6.3.3, pp. 116–117

Estimated Delivery Rate Impact

On page 116 of the Application, FEI states: "FEI has calculated a cost of service for both the AMI Project and the Baseline meter program with the difference between them resulting in the incremental impact of the AMI Project."

On page 7 of the Application, FEI states: "Overall, the AMI Project is expected to be effectively rate neutral over the 26-year analysis period, with the incremental levelized delivery rate impact estimated to be 0.125 percent using conservative assumptions."

31.1 Please provide FEI's definition of "incremental levelized delivery rate impact."

Response:

FEI uses a levelized rate calculation in its CPCN applications to provide a view of the cost of a CPCN project over its lifetime, as its assets are long-lived, rate impacts will vary each year, and the all-in costs and benefits of CPCN projects need to be considered over those timeframes.

The incremental levelized delivery rate impact is the expected delivery rate increase from currently approved (2021) rates for the incremental cost of service (i.e., difference between Baseline and AMI) over the 26-year analysis period on a present value basis. In other words, the equivalent delivery rate increase to recover the present value of the incremental cost of service would be 0.125 percent per year over the 26-year analysis period.

31.2 Please clarify whether the incremental financial analysis reflects the expected rate changes that FEI customers will experience as a result of the project.

Response:

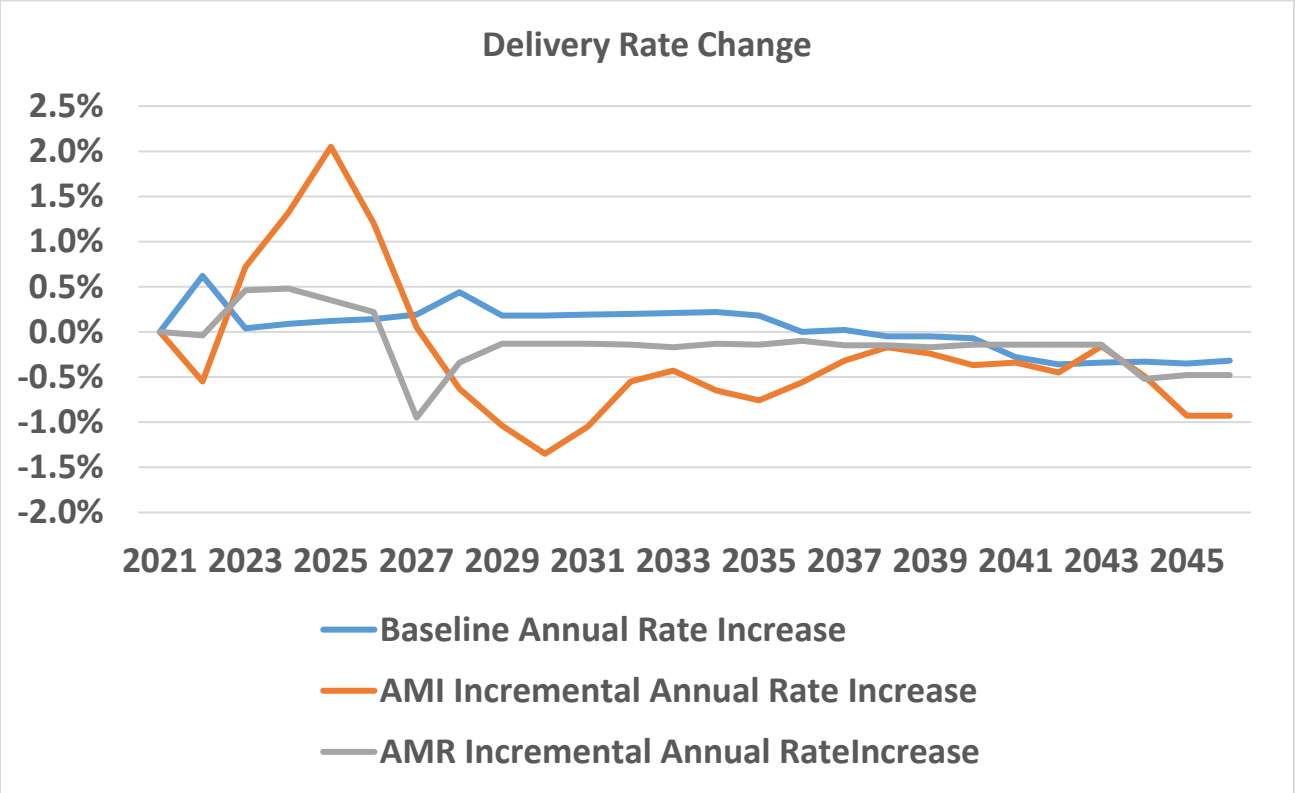
As discussed in the response to BCUC IR1 31.1, the incremental levelized rate of 0.125 percent represents the annual delivery rate impact of the Project over the 26-year analysis period on a present value basis. Customers will experience delivery rate increases/decreases as assets enter rate base and O&M costs/savings are achieved on an annual basis. As discussed in Section 6.3.3 of the Application, the cumulative delivery rate impact of the Project in 2027 would be 4.79 percent, and by 2033, the year after the in-service meter write off deferral is fully amortized, the incremental delivery rates impact of the Project will decrease below current 2021 delivery rates levels. Please refer to the response to BCUC IR1 31.3 for the year-to-year incremental delivery rate impact due to the AMI Project from 2021 to 2046.

31.3 Please provide the annual incremental delivery rate percentage change as compared to the preceding year for each year of the 26-year financial analysis and for each analysis (i.e. AMI, AMR, baseline and incremental). Please include the working spreadsheets with the corresponding calculations, confidentially if required, and a summary table in a public response.

Response:

FEI provides the following table summarizing the forecast annual incremental delivery rate impacts for the Baseline, AMI, and AMR scenarios. Please refer to Attachment 31.3 for the working spreadsheets detailing the calculations.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Baseline Annual Rate Impact	0.00%	0.62%	0.04%	0.09%	0.12%	0.14%	0.19%	0.44%	0.18%	0.18%	0.19%	0.20%	0.21%
AMI Incremental Annual Rate Impact	0.00%	-0.55%	0.72%	1.32%	2.05%	1.20%	0.05%	-0.63%	-1.04%	-1.35%	-1.05%	-0.55%	-0.43%
AMR Incremental Annual Rate Impact	0.00%	-0.04%	0.46%	0.48%	0.35%	0.22%	-0.95%	-0.34%	-0.13%	-0.13%	-0.13%	-0.14%	-0.17%
	2034	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**
Baseline Annual Rate Impact	0.22%	0.18%	0.00%	0.02%	-0.05%	-0.05%	-0.07%	-0.28%	-0.36%	-0.34%	-0.33%	-0.35%	-0.32%
AMI Incremental Annual Rate Impact	-0.65%	-0.76%	-0.56%	-0.32%	-0.17%	-0.24%	-0.37%	-0.34%	-0.45%	-0.16%	-0.49%	-0.93%	-0.93%
AMR Incremental Annual Rate Impact	-0.13%	-0.14%	-0.10%	-0.15%	-0.15%	-0.17%	-0.14%	-0.14%	-0.14%	-0.14%	-0.52%	-0.48%	-0.48%



31.4 Please provide a sensitivity analysis for the incremental annual rate impact over the 26-year analysis period, if actual project costs (i.e., capital and O&M) are +/-10%, +/-20%, +/-30%.

Response:

To provide a response to this question, FEI has run the sensitivity scenarios on the AMI Project capital and the new AMI O&M that will result from the Project. There would be no change to the capital and O&M costs under the Baseline scenario.

In general, increasing the capital and O&M costs by 10, 20, and 30 percent will result in a higher incremental levelized delivery rate impact and decreasing the costs by the same amounts will result in a reduced incremental levelized delivery rate impact.

For ease of comparison FEI provides the following table summarizing the incremental levelized delivery rate increases over the 26-year analysis period for the sensitivity scenarios Providing the incremental annual rate impact by year (as opposed to incremental levelized delivery rate) for each scenario would result in a significant amount of data and would be extremely difficult to compare the annual amounts of each scenario in a meaningful way. FEI also notes the incremental levelized delivery rate impact is how the analysis of the Project has been evaluated, therefore it is logical to compare the result using this metric when running the sensitivity scenarios.

Capital & O&M Sensitivity	-30%	-20%	-10%	Application	+10%	+20%	+30%
Incremental Levelized Delivery Rate Increase (%)	-1.552%	-0.993%	-0.434%	0.125%	0.684%	1.243%	1.802%

For clarity, the starting incremental levelized rate increase for the Project was 0.125 percent; therefore, increasing the Project capital and O&M by 10 percent results in the incremental levelized delivery rate impact changing from 0.125 percent to 0.684 percent. FEI also notes a reduction of AMI O&M costs by 10 percent or more will result in the incremental levelized delivery rate impact becoming negative (i.e. net reduction to FEI customer rates) as the reduced AMI O&M will result in an even higher O&M savings when compared to the Baseline scenario which overcomes the incremental capital due to AMI.

On page 117 of the Application, FEI provides the net present value of the annual revenue requirements over the 26-year analysis period for the AMI, baseline, and incremental scenarios and the associated levelized rate increase for each scenario when compared to 2021 rates.

On page 111 of the Application, FEI states that "[i]nflation is estimated to be two percent over the 26-year analysis period" and "has been consistently applied to all capital and O&M."

31.5 Please confirm whether inflation was applied to the 2021 revenue requirement over the 26-year analysis period, prior to calculating the present value of the revenue requirements for the levelized rate impact. If not, please explain why not.

Response:

Consistent with usual practice in its CPCN applications, FEI confirms that inflation was not applied to the 2021 revenue requirement in the 26-year analysis period. The purpose of the levelized rate impact is to calculate the total present value of the incremental cost of service for the Project as compared to the existing (2021) revenue requirement; in other words, the impact the Project has on today's rates. In that calculation the 2021 revenue requirement is held constant at the 2021 approved amount and does not include inflation. In reality, rates will be higher in the future than they are today and the rate impacts of the Project in each of the future years will be muted.

32.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.1, p. 97; Section 6.3.1, p. 110

Financial Analysis Period

On page 110 of the Application, FEI states:

> The financial analysis period FEI has used is 20 years after deployment of the last AMI meter installed. The 20-year period is equal to the estimated useful life of the new AMI meters. The last AMI meter to be exchanged is in 2026, resulting in 2046 as the final year of the analysis period. Twenty years Post-deployment plus 6 years 2021-2026 for Pre-deployment and deployment result in a 26-year analysis period.

On page 97 of the Application, FEI defines the deployment phase as "the time period from 2023 to 2026", when "the majority of the AMI meters will be deployed."

32.1 For the AMI meters that will be deployed in 2023-2026, please confirm the years that these meters will need to be replaced and provide the forecast costs by year, with an explanation for any assumptions used.

32.1.1 Please confirm whether the AMI and incremental financial analyses include these forecast costs to replace the AMI meters at the end of their useful life. If yes, please indicate where in the financial analysis these costs are included.

32.1.1.1 If not, please explain why not and explain whether there is a more appropriate analysis period capturing replacement costs for end of life AMI meters.

Response:

FEI clarifies both the AMI scenario and the Baseline scenario include replacement of one life cycle for all non-AMI meters that will be in-service up to the end of 2022. For the AMI scenario, all of these non-AMI meters will be replaced during the AMI deployment period from 2023 to 2026, while for the Baseline scenario, the same set of non-AMI meters will be replaced over time from 2023 to 2040. If the financial analysis were to include the second life cycle of meters with the replacement costs of the AMI meters after the initial 20 years under the AMI scenario, then for fair comparison, the Baseline scenario should also include the ongoing replacement costs of non-AMI meters beyond 2040 as well. This analysis for the second life cycle should also include the O&M savings from AMI over the Baseline scenario beyond 2040. FEI notes that, all else equal, completing the financial analysis over two life cycles for the AMI scenario and the Baseline scenario would not change FEI's proposal to implement the AMI Project, as the additional cycle would add more years of incremental O&M savings for the AMI scenario into the financial analysis offsetting the additional capital costs.

However, in order to be responsive, the following tables provide the forecast number of meter exchanges that would be required as well as the associated capital and O&M costs for both the

AMI and the Baseline scenarios from 2041 to 2060 that would cover the second life cycle of the meters. It can be seen that the total number of meters expected to be replaced over this second life cycle is the same between the two scenarios. FEI notes the number of meters to be replaced from 2041 to 2060 is based on the number of meters installed between 2023 to 2040 plus any early exchanges based on an allowance for 0.5 percent of AMI meter failures as discussed in Section 6.2.1.1. For the replacement capital and O&M[16] costs from 2041 to 2060, FEI assumed the forecast unit cost data as included in Confidential Appendix G-1 at 2040 plus an annual escalation of 2 percent per annum.

2nd Life Cycle Meter Exchange Units 000's	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
AMI	-	-	168.2	326.4	326.6	168.3	16.6	16.7	16.7	16.6	19.0	19.0	18.9	16.3	16.1	16.0	20.5	19.4	19.6	19.7	1,240.7
Baseline	53.4	53.0	69.6	69.7	69.6	69.6	69.5	68.1	68.0	67.8	67.7	67.5	67.3	67.0	71.3	80.1	80.8	80.8	-	-	1,240.7
Incremental	**(53)**	**(53)**	**99**	**257**	**257**	**99**	**(53)**	**(51)**	**(51)**	**(51)**	**(49)**	**(49)**	**(48)**	**(51)**	**(55)**	**(64)**	**(60)**	**(61)**	**20**	**20**	**(0.0)**

2nd Life Cycle Meter Exchange Costs ($millions)	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
AMI	-	-	55.6	110.0	112.3	59.0	5.9	6.1	6.2	6.3	7.4	7.5	7.6	6.7	6.8	6.8	8.9	8.6	8.9	9.1	439.9
Baseline	13.6	13.8	18.4	18.8	19.2	19.6	19.9	19.9	20.3	20.7	21.0	21.4	21.7	22.1	23.9	27.6	28.4	28.9	-	-	379.2
Incremental	**$ (13.6)**	**$ (13.8)**	**$ 37.2**	**$ 91.2**	**$ 93.1**	**$ 39.4**	**$ (14.0)**	**$ (13.8)**	**$ (14.1)**	**$ (14.3)**	**$ (13.7)**	**$ (13.9)**	**$ (14.1)**	**$ (15.4)**	**$ (17.1)**	**$ (20.7)**	**$ (19.4)**	**$ (20.3)**	**$ 8.9**	**$ 9.1**	**$ 60.6**

2041-2060 O&M ($millions)	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
AMI	14.8	15.0	15.2	15.4	15.9	16.2	16.8	16.9	17.2	17.4	17.7	18.2	18.5	18.7	18.9	19.2	19.5	19.8	20.3	20.7	352.4
Baseline	35.1	35.8	36.5	37.2	37.9	38.7	39.9	40.7	41.5	42.4	43.2	44.1	44.9	45.8	46.8	47.9	48.9	49.8	49.5	50.5	857.1
Incremental	**$ (20.3)**	**$ (20.8)**	**$ (21.2)**	**$ (21.8)**	**$ (22.0)**	**$ (22.5)**	**$ (23.2)**	**$ (23.8)**	**$ (24.4)**	**$ (24.9)**	**$ (25.5)**	**$ (25.9)**	**$ (26.5)**	**$ (27.1)**	**$ (27.9)**	**$ (28.7)**	**$ (29.3)**	**$ (30.0)**	**$ (29.2)**	**$ (29.8)**	**$ (504.7)**

32.2 Please confirm whether the baseline financial analysis includes costs to replace the non-AMI meters at the end of their estimated useful life.

32.2.1 If confirmed, please provide the cost to replace these meters each year, with reference to the financial schedules.

32.2.2 If not confirmed, please explain why these costs are not included.

Response:

FEI confirms the Baseline scenario includes the forecast costs to fully exchange the existing in service non-AMI meters including forecast additions to the fleet up to and including the year 2022. These costs are forecast to occur up until the year 2040 and are comparable to the costs of exchanging the entire meter fleet with AMI meters in the AMI scenario. The cost associated with exchanging the current in-service non-AMI meter fleet once is included in the financial analysis and is provided in Confidential Appendix G-4, Schedule 6, lines 1-5.

FEI also notes the Baseline scenario is consistent with the AMI scenario and does not include costs related to a second life cycle exchange beyond 2040. Please refer to the response to BCUC

[16] The financial analysis included in the application already includes O&M savings for 2041-2046 shown in the O&M table in this response.

IR1 32.1 for further discussion on meter exchanges included in the financial analyses for both the Baseline and AMI scenarios.

32.3 Please confirm whether any alternative financial analysis period for the AMI Project was considered by FEI. If yes, please list the alternatives considered and discuss why they were ultimately rejected.

Response:

FEI normally selects the analysis period for CPCNs in consideration of the useful life of the main capital asset included in the Project. For the AMI Project the AMI meters represent a majority of the cost and have an estimated useful life of 20 years. As stated in the preamble, the 20-year life combined with the 6 years for pre-deployment and deployment resulted in a 26-year analysis period.

FEI also considered a 40-year analysis period. FEI considered running the analysis for 40 years to include a second life cycle of meters, but ultimately rejected this approach in order to keep the analysis simple and follow the more consistent approach of keeping the analysis period set to one cycle of the asset's useful life. Please refer to the response to BCUC IR1 32.1 for further discussion on reasons for completing the analysis over one life cycle of the meters.

33.0 Reference: PROJECT COSTS

Exhibit B-1, Section 6.3.3.2, pp. 117–118

Fort Nelson Estimated Delivery Rate Impact

On pages 117 and 118 of the Application, FEI states:

> The analysis for the AMI project has been prepared by including costs and benefits for all of FEI's service areas, including Fort Nelson. When the Project commences, direct costs will be charged to Fort Nelson. … Fort Nelson's cost of the project is estimated at $1.5 million in capital and would require a meter write off of an estimated $0.1 million. The estimated levelized delivery rate increase of the project for Fort Nelson would be 1.41 percent.

33.1 Please clarify whether FEI is seeking approval of the direct charges for AMI Project capital and O&M costs to Fort Nelson as part of this Application.

Response:

As noted in section 6.3.3.2 of the Application, the AMI Project has been prepared including the cost and benefits for all of FEI's service areas, including Fort Nelson. The Project, as submitted, includes the direct charges to Fort Nelson for capital items, and correspondingly, FEI is seeking approval of the Project as a whole. If the AMI Project is approved, future rate filings for both FEI and Fort Nelson will include the AMI O&M costs and benefits and any required sustaining capital.

33.2 Please provide the incremental rate impact for Fort Nelson for each year of the 26-year analysis period.

Response:

When preparing this response FEI noted an error in the underlying Fort Nelson AMI model related to incorrect depreciation that was used for the capitalized project management costs. FEI has corrected this and the estimated levelized delivery rate impact for Fort Nelson has changed from 1.41 percent to 0.89 percent. FEI has filed this change and provided updated working excel models for Fort Nelson that were filed on June 21, 2021 as errata filed concurrently with these IR responses.

FEI provides the following tables summarizing the cumulative and annual incremental delivery rate impacts for Fort Nelson. Please refer to Attachment 33.2 for a working spreadsheet with the calculations.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
FTN Baseline[1]	5.22%	5.65%	5.70%	5.77%	5.87%	5.99%	6.27%	6.46%	6.61%	6.77%	6.94%	7.11%	7.29%
FTN AMI[2]	5.22%	5.35%	5.42%	10.97%	10.92%	10.67%	10.11%	9.98%	8.35%	8.21%	8.07%	7.92%	7.74%
FTN Incremental Cumulative[3]	0.00%	-0.30%	-0.28%	5.20%	5.05%	4.68%	3.84%	3.52%	1.74%	1.44%	1.13%	0.81%	0.45%
FTN Incremental Annual[4]	0.00%	-0.29%	0.02%	5.48%	-0.15%	-0.37%	-0.84%	-0.32%	-1.78%	-0.31%	-0.30%	-0.32%	-0.36%
	2034	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**
FTN Baseline[1]	7.47%	7.61%	7.65%	7.66%	7.61%	7.58%	7.55%	8.06%	7.17%	6.95%	6.74%	6.54%	6.33%
FTN AMI[2]	7.39%	7.21%	7.03%	6.86%	6.64%	5.49%	5.20%	4.85%	4.84%	4.66%	4.48%	4.33%	4.15%
FTN Incremental Cumulative[3]	-0.08%	-0.40%	-0.62%	-0.80%	-0.97%	-2.09%	-2.35%	-3.22%	-2.33%	-2.29%	-2.26%	-2.21%	-2.18%
FTN Incremental Annual[4]	-0.53%	-0.32%	-0.22%	-0.18%	-0.17%	-1.12%	-0.26%	-0.87%	0.89%	0.04%	0.03%	0.05%	0.03%

[1] Schedule 10, Line 28 Updated Fort Nelson Baseline Model CONFIDENTIAL

[2] Schedule 10, Line 28 Updated Fort Nelson AMI Model CONFIDENTIAL

[3] FTN AMI less FTN Baseline

[4] FTN Incremental Cumulative current year less FTN Incremental Cumulative Prior year

33.3 Please provide the annual incremental delivery rate percentage change as compared to the preceding year for each year of the 26-year financial analysis for Fort Nelson. Please include the working spreadsheets with the corresponding calculations, confidentially if required, and a summary table in a public response.

Response:

Please refer to the response to BCUC IR1 33.2.

E. PROVINCIAL GOVERNMENT ENERGY OBJECTIVES

34.0 Reference: PROVINCIAL GOVERNMENT ENERGY OBJECTIVES
Exhibit B-1, Section 4.3.2.4.2 p. 61; Section 8.2.2 p. 142
The CleanBC Plan

On page 61 of the Application, FEI states, "AMI meters are also hydrogen compatible, which is an important feature as FEI continues to investigate the use of other renewable gases for the purposes of GHG reductions."

On page 142 of the Application, FEI states:

> The Project is aligned with the CleanBC Plan and FortisBC's Clean Growth Pathway as follows:
>
> - the proposed advanced meters are compatible with certain renewable gases, such as hydrogen and biomethane;
> - the proposed advanced meters provide detailed data which can enhance energy efficiency programs and help customers to better manage their gas consumption; and
> - the proposed advanced meters substantially eliminate manual meter reading thereby avoiding GHG emissions associated with meter reading vehicles as described in Section 4.3.2.1.

34.1 Please explain whether there is a maximum percentage of hydrogen energy content in the gas stream above which the Sensus meter would not function as designed.

Response:

Yes. Due to hydrogen's effect on the specific gravity of the blended gas there is a point at which the meter will not function within specification. The Sensus contract states the meter will be compliant with hydrogen blends of up to 10 percent by volume in natural gas. In addition, FEI conducted independent testing of the Sensus SonixIQ meter that successfully verified that the SonixIQ meters would function as designed with hydrogen blends beyond 20 percent by volume in natural gas. Generally, to date in the North American and European market, most readiness review, research, development, and initial hydrogen blending trials related to hydrogen distribution in the gas system have been limited to blend concentrations in the range of 20 to 30 percent mixture by volume.

34.2 Please explain whether there is a maximum percentage of biomethane energy content in the gas stream above which the Sensus meter would not function as designed.

Response:

Given the similar physical properties of biomethane to conventional natural gas, and in accordance with FEI's standard that biomethane producers must meet to inject gas into FEI's system, the advanced meters will function with 100 percent biomethane.

34.3 Please explain whether all of the project benefits are still valid in consideration of the Climate Change Accountability Act.[17]

34.3.1 If no, please explain how the AMI Project and its associated benefits remain valuable during the energy transition.

Response:

All of the Project benefits are still valid in consideration of the *Climate Change Accountability Act* (CCAA). The CCAA is focused on setting GHG emission reduction targets for BC. As discussed in Section 8.2.2 of the Application, the Project is aligned with FortisBC's Clean Growth Pathway, which aims to reduce GHG emissions in-line with the province's CleanBC plan. Some of the Project benefits that assist the energy transition relate to operational improvements, such as in the areas of system resiliency, system planning, system integrity, and safety, while other benefits relate to providing customers with timely energy use information, as discussed in Section 4.3.2.4 of the Application. AMI is a key enabling technology that allows the use of advanced analytics to better inform consumer decisions, identify conservation potential and potentially other opportunities to reduce carbon emissions through targeted measures based on specific customer usage and other factors.

In terms of operational benefits, more detailed consumption data would improve FEI's ability to verify locations with adequate sustained local demand to further encourage and attract RNG producers to attach and inject into the distribution network and more feasibly integrate distributed renewable gas supplies across the network. This will enable FEI to increase the proportion of renewable gases in its system for the purposes of reducing GHG emissions. Additionally, the benefits associated with the elimination of manual meter reading include a reduction in GHG emissions relating to reduced vehicle requirements.

With regard to energy use information for customers, by empowering customers with timely access to energy use information, they are able to improve their decision-making regarding energy use, which would also provide FEI the opportunity to offer customers enhanced DSM

[17] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/07042_01.

programs for a greater opportunity to support conservation, thereby lowering their GHG emissions.

34.4 Please explain whether there are any project benefits that are impacted, such as leak detection, with the addition of the maximum percentage addition of hydrogen and/or biomethane.

Response:

FEI is not aware of any impacts to Project benefits with the addition of a maximum percentage of hydrogen or biomethane to the distribution system.

F. CONSULTATION

35.0 Reference: CONSULTATION

Exhibit B-1, Section 7.2.9, p. 132; Appendix H-2; Appendix I-2

Customer Refusals and Opt-Out

In Section 7 of the Application, FEI explains its consultation to date related to the AMI Project. In Appendix H-2 and Appendix I-2, FEI details its engagement logs.

On page 132 of the Application, FEI states: "FEI acknowledges that there are some members of the community that remain opposed to the Project due largely to perceived health issues associated with the new meters' RF and the increased use of wireless technology in general."

35.1 Based on customer feedback received on the FEI AMI Project to date and lessons learned from the FBC AMI Project implementation, please explain FEI's understanding of the breakdown of customers likely to opt-out, highlighting any variance by geographic location or socio-economic status. Please explain any trends including whether there are regions of opposition to the project, groups who are opposed, etc.

Response:

As discussed in Sections 5.8 and 7 of the Application, in addition to FBC's previous experience on the AMI Project, FEI understands that concern regarding radio frequency emissions is the primary reason for customers seeking to opt-out.

Appendix H-2 illustrates the feedback received from customers in relation to the FEI AMI Project. FEI has not conducted further segmentation of the inquiries based on geographic location or socio-economic status and is, therefore, unable to provide insights on any specific trends.

36.0 Reference: CONSULTATION

Exhibit B-1, Section 7.2.11, p. 133; Appendix H-1; Appendix H-7

Consultation and Communications Plan Going Forward

On page 133 of the Application, FEI states:

> FEI anticipates interest in the Project will increase as it approaches deployment, and as such, FEI will update its Consultation, Engagement and Communications Plan. To ensure it is effective, FEI's updated plan will incorporate:
>
> - Lessons learned since Project announcement and during consultation completed so far;
> - Lessons learned from FBC's deployment of advanced meters;
> - Feedback received from early consultation;
> - Ongoing dialogue with customers, stakeholders and municipalities; and
> - Industry best practices as learned from other utilities that have deployed similar technology.
>
> Due to the scale and geographic reach of the Project, FEI's future consultation and communication activities will be tailored to address the unique needs of the various regions it serves. Broadly speaking these activities are expected to include:
>
> - Direct notifications and virtual information sessions for provincial, local and regional governments;
> - Customer communications, including via bill inserts and Energy Moment;
> - General Project updates communicated via a website, social media, advertising and media outreach;
> - Stakeholder and community presentations and meetings;
> - Public information sessions; and
> - Regular employee updates.
>
> The Project website, email address and phone number will be maintained as an easy-to-access channel for customers and the broader public to provide FEI with feedback. As well, FEI will continue to regularly update all levels of government and other stakeholders.

In Appendix H-1, FEI provides its Consultation, Engagement and Communications Plan.

36.1 Please confirm, or otherwise explain, whether FEI has consulted with any employees who may be affected by the AMI Project, or with potentially affected employee unions.

Response:

FEI has pursued a number of different activities to inform employees about the Application, including creating a dedicated Project page on its intranet site, Connector, to update employees on the development of the Project. While FEI has had general discussions with affected employee unions, detailed discussions regarding potential impacts will occur during the Define phase (as discussed on Section 5.5.1.2 of the Application) of the Project when potential impacts are known.

36.2 Please provide an updated Consultation, Engagement and Communications Plan for the duration of the AMI Project including any future public consultation contemplated subsequent to the preparation of the CPCN application.

Response:

FEI has provided an updated Consultation, Engagement and Communications plan as Attachment 36.2. FEI's Consultation, Engagement and Communications plan will continue to be refined to include more detail as the Project progresses, as well as to incorporate customer feedback received through ongoing engagement. If the AMI Project is approved by the BCUC, FEI is committed to ensuring that open and transparent consultation, communications, and engagement is achieved throughout the lifespan of the Project.

36.3 Please explain the lessons learned since the AMI Project announcement and during consultation completed so far.

Response:

FEI has observed the following learnings since announcing the Project:

- Communication and engagement methods utilized to date have been successful in educating customers about the Project, as supported by research conducted (Appendix H-05).
- Virtual information sessions hosted in February 2021 provided opportunities for broader outreach and attendance, increased online engagement/interest, reduced financial impacts, and increased efficiencies in logistics.

Based on early consultation, the number of customers who may request a radio-off meter appears to be lower than initial estimates made by the Project, and some customers have offered to be

early adopters for the advanced gas meters. FEI will continue to incorporate lessons learned to inform and refine consultation, engagement and communication planning throughout the Project.

36.4 Please explain the lessons learned from FBC's deployment of advanced meters pertaining to consultation, engagement and communications.

Response:

FEI has observed the following lessons learned from FBC's Electric AMI project:

- Early engagement and consultation about the Project with customers and stakeholders and Indigenous groups is key to helping inform further consultation and engagement planning and development;
- Effective communications and consultation need to be frequent, timely, centralized, and easy to understand;
- Information sessions should be interactive, engaging, and valuable to those who attend;
- Notification letters should provide Project updates and upcoming appointments;
- Advertisements should notify when technicians will be in the area; and
- Customers prefer scheduled appointments as opposed to regional unscheduled installs.

Lessons learned are based on customer consultation such as information sessions and feedback received throughout the FBC project. FEI anticipates that the aforementioned lessons learned will be consistent between FBC and FEI customers and therefore are foundational in the Consultation, Engagement, and Communications plan for the Project.

36.5 Please explain industry best practices pertaining to consultation, engagement and communications as learned from other utilities that have deployed similar advanced meter technology.

Response:

In addition to FBC, FEI has communicated with relevant utilities that have deployed AMI technology, such as BC Hydro, and has observed other North American utilities' consultation, engagement, and communication practices for their respective AMI deployments. FEI also has extensive experience with large-scale customer communications and is well positioned to utilize existing consultation, engagement, and communication practices, which generally align with other

utilities' practices, to support effective deployment. FEI has noted the following best practices for AMI deployments:

- Customer research, such as surveys, are beneficial to understand the communication methods preferred by customers and help inform future engagement and consultation planning;
- Early and consistent consultation, engagement, and communication about the project is necessary to ensure customers are informed;
- Open and transparent communication about the project is important. This includes providing opportunities for feedback, and keeping customers informed and engaged about Project developments; and
- Diverse communication channels are necessary to ensure all customer demographics are captured.

FEI has incorporated these practices and will continue to leverage existing knowledge and expertise from industry, to inform its consultation, engagement, and communication plans throughout the Project.

In the Advanced Gas Meter Information Session Survey, provided as Appendix H-7 to the Application, 87% of attendees said additional in-person sessions would be very or somewhat effective to best keep customers informed.

36.6 Please explain whether FEI is planning any further in-person information sessions.

Response:

As discussed in the response to BCUC IR1 36.2, FEI anticipates facilitating information sessions in advance of regional deployment of the advanced meters. FEI will consider a combination of in-person and virtual information sessions to ensure that customers are informed and provided opportunities to offer feedback as the Project proceeds.

37.0 Reference: CONSULTATION

Exhibit B-1, Section 7.3, pp. 134–138; Appendix I; Appendix I-2;

Engagement with Indigenous Groups

On pages 134–138 of the Application, FEI discusses its engagement efforts with Indigenous groups. In Appendix I, FEI provides several documents pertaining to Indigenous engagement.

In Table 7-1 on page 136 of the Application, FEI lists the Indigenous groups potentially affected by the Project and with which it has engaged.

37.1 Please provide copies of any documents or evidence which confirms that Indigenous groups affected or potentially affected by the Project are satisfied with the engagement to date.

Response:

FEI has no documentation from Indigenous groups potentially affected by the Project expressing their level of satisfaction with the engagement to date.

37.2 Please confirm that the Indigenous groups potentially affected have been notified of the filing of the Application with the BCUC and have been informed on how to raise outstanding concerns with the BCUC.

Response:

On August 31, 2021, FEI sent a letter to all Indigenous groups directly affected[18] by the Project to provide notice of the filing of its Application.

In addition, FEI published notice of its filing of the Application in local and regional newspapers across the province as well as on FEI's website and social media platforms in July 2021. These notifications broadly targeted all FEI customers, which includes customers who are also members of Indigenous groups, and informed them how to become involved in the BCUC process.

FEI provides its Indigenous Engagement Log as Appendix I-2 to the Application. The most recent item logged is dated March 2021.

[18] Directly affected Indigenous groups are also FEI customers.

37.3 Please update the Indigenous Communities Engagement Log with activities that have taken place since March 2021.

Response:

Please refer to the updated Indigenous Communities Engagement log provided in Attachment 37.3.

G. APPENDIX H – CONSULTATION AND ENGAGEMENT

38.0 Reference: CONSULTATION AND ENGAGEMENT

Exhibit B-1, Appendix H-2, pdf p. 527

Stakeholder and Government Consultation Log

On pdf page 527 of Appendix H-2 to the Application, FEI states it met with the Institute for Catastrophic Loss Reduction (ICLR) on November 20, 2020. The meeting summary provided by FEI states:

> Met with members from the ICLR who provided an overview of the work they do in assessing risks associated with natural disasters and disaster prevention research and communication. Discussion focused primarily on the scope of the advanced meters project and safety benefits proposed with the remote shut-off capability. The ICLR appreciated all the safety enhancements proposed by the Project, and recommended that FEI investigate the option of including seismic shut-off valves within the meter. FEI appreciated the information provided and will explore seismic valves for the Project.

38.1 Please explain whether FEI has explored seismic valves for the AMI Project.

Response:

FEI explored options for seismic detection and response, including seismic shutoff valves. FEI concluded that the optimal solution was to utilize the intelligent capabilities of AMI, including remote shutoff capabilities, excess flow shutoff, and leak detection which provides the safety benefits of a seismic detection and response program with lower risks of the shutoff being triggered for other non-related reasons.

"Project Phone and Email Inquiries" in Appendix H-2 to the Application lists several communications from individuals requesting radio-off meters or no new meter.

38.2 Please explain whether the number of radio-off meter requests received through public engagement is consistent with FEI's anticipated level of radio-off meter requests from customers.

38.2.1 If greater or less than anticipated, please explain whether FEI considered updating its Project scope and costs estimates accordingly.

Response:

FEI initially estimated approximately two percent of customers will request a radio-off meter. The estimate was based on experience from the FBC AMI project. To date, FEI has received feedback indicating that a small minority of customers may request the radio-off option and that such requests may be lower than initial estimates made by the Project team. However, FEI anticipates interest in the Project to increase during deployment, which may increase radio-off requests.

At this time, FEI has insufficient new information to support updating its Project cost scope or cost estimates.

39.0 Reference: CONSULTATION AND ENGAGEMENT

Exhibit B-1, Appendix H

Communications Materials

FEI provided its communications materials in Appendices H-3, H-4, H-10, H-11, H-12, H-14, H-15, H-16, H-17, H-18, H-19, H-20, H-21, H-22, H-23, H-24, H-25, H-26 to the Application.

39.1 Please explain why none of the communications materials in the appendices listed above contained information about the overall cost or rate impact of the AMI Project.

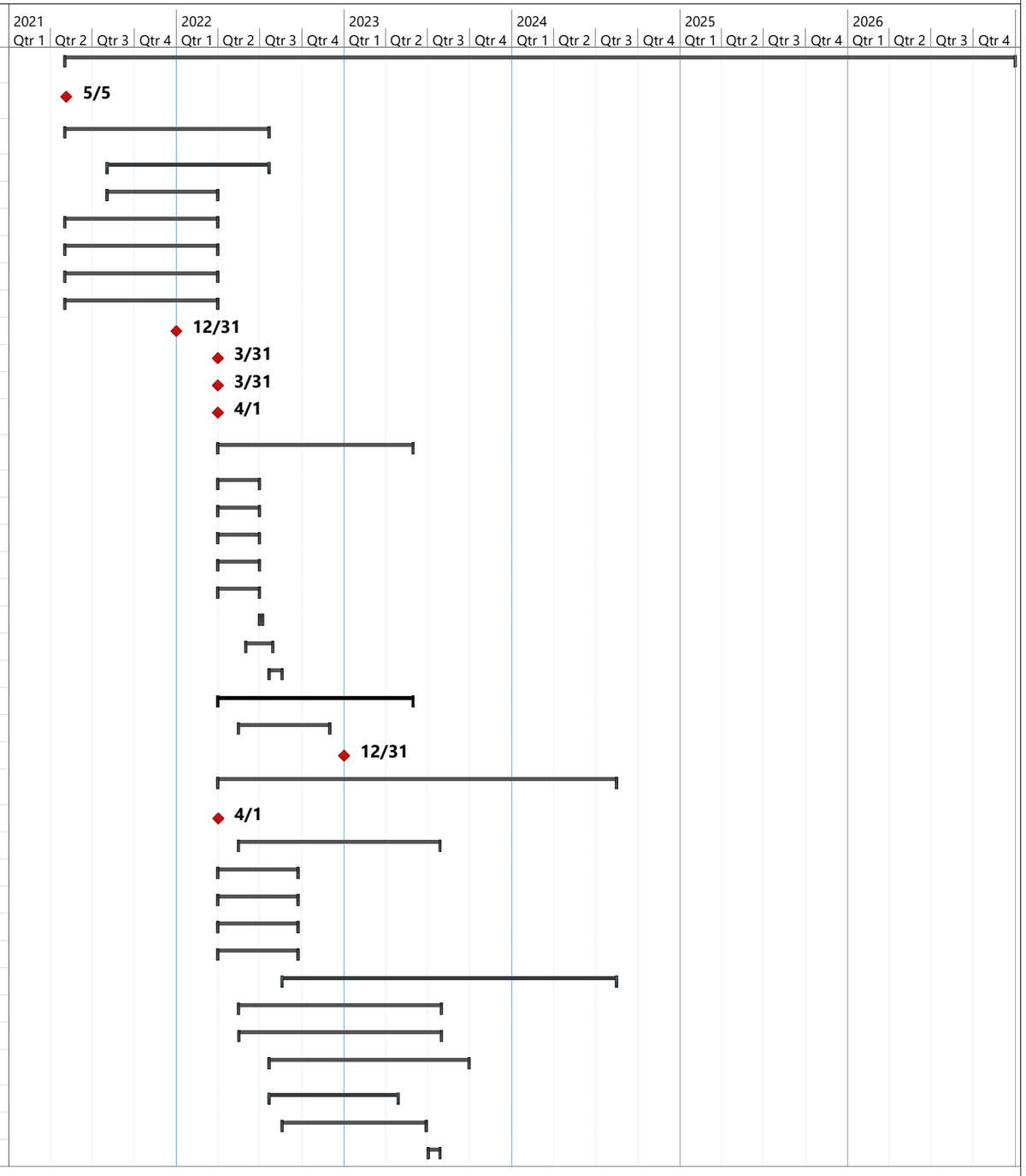
Response:

Finalized Project costs and the resulting rate impacts were not known during the early stages of engagement and consultation. However, once these figures were determined prior to filing the Application, FEI was able to share more information regarding estimated rate impacts and received and addressed resulting inquiries. FEI's current Project webpage reflects updated information on rate impacts.

Attachment 16.2

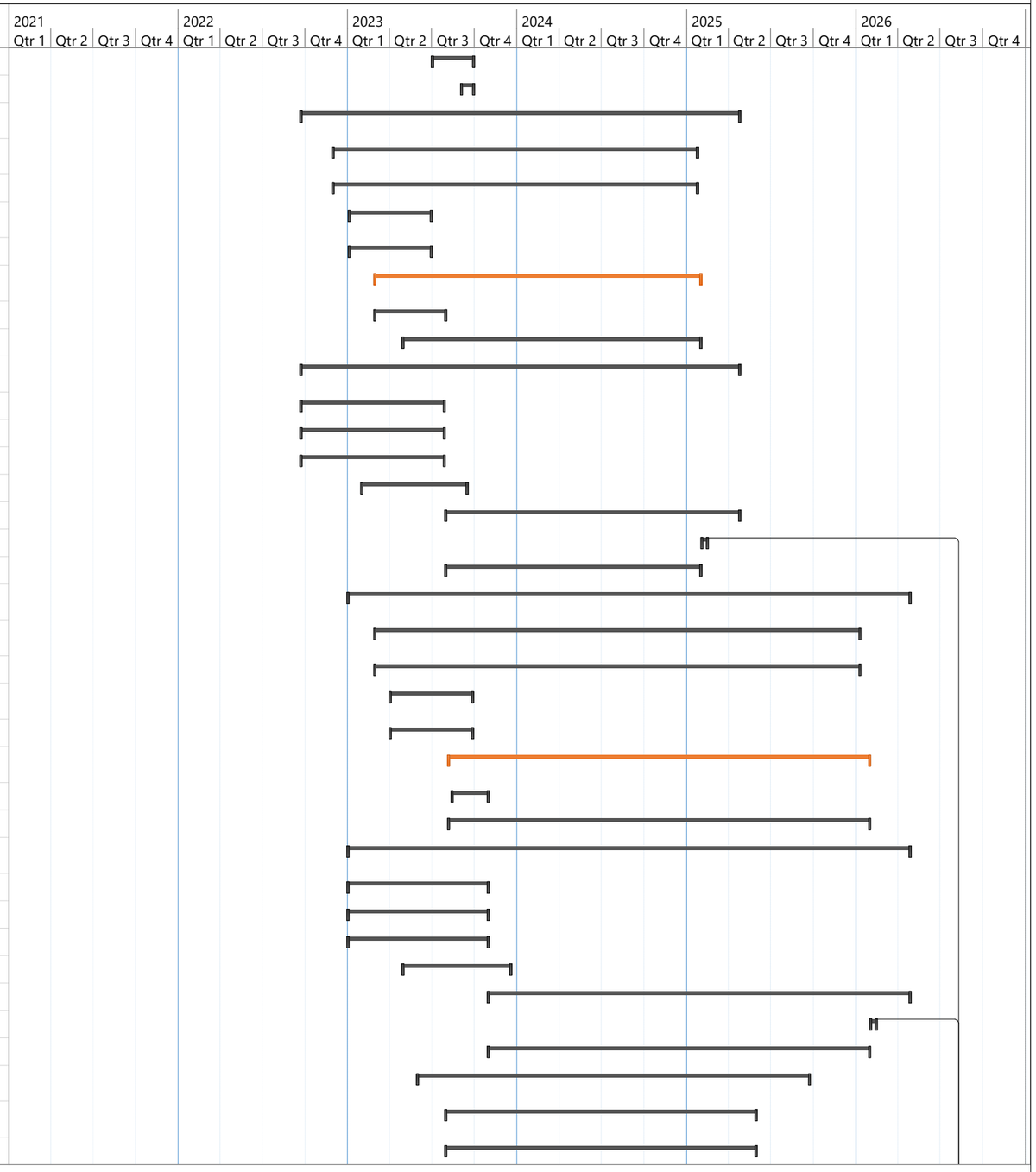
Gas AMI Project Preliminary Plan

ID	Task Name
1	**GAS AMI PROJECT**
2	**CPCN FILED**
3	**PREPARE**
4	AMI TECHNOLOGY SITE READINESS
7	FEI TECHNOLOGY INTEGRATION REQUIREMENTS
10	FEI CHANGE MANAGEMENT STRATEGY DEVELOPED
19	FEI OPERATIONS PROCESS INTEGRATION STRATEGY DEVELOPED
25	FEI INTERNAL COMMUNICATIONS STRATEGY DEVELOPED
29	FEI EXTERNAL RELATIONS STRATEGY DEVELOPED
32	MEASUREMENT CANADA METER APPROVAL RECEIVED
33	DEPLOYMENT STRATEGY FINALIZED
34	TECHNICAL SAFETY BC APPROVAL RECEIVED
35	**NOTICE TO PROCEED ISSUED**
36	**DEFINE**
37	FEI CHANGE MANAGEMENT PLANS DEVELOPED
46	FEI OPERATIONS PROCESS INTEGRATION PLANS DEVELOPED
52	FEI INTERNAL COMMUNICATIONS PLANS DEVELOPED
56	FEI EXTERNAL RELATIONS PLANS DEVELOPED
59	TRAINING STRATEGIES DEVELOPED
70	FORMAL KICK-OFF
72	AMI TECHNOLOGY REQUIREMENT WORKSHOPS
76	FEI TECHNOLOGY INTEGRATION REQUIREMENTS FINALIZED
92	METER UPGRADE PLANNING & PROCESSES
99	REGIONAL FACILITY AND VEHICLE REQUIREMENTS
102	MEASUREMENT CANADA METER DISPENSATION RECEIVED
103	**DESIGN, BUILD, INTEGRATE AND READY FOR DEPLOYMENT**
104	TECHNICAL SAFETY BC APPROVAL RECEIVED
105	PROCUREMENT PLANNING FOR DEPLOYMENT
108	FEI CHANGE MANAGEMENT ASSESSMENT AND PLANNING
117	FEI OPERATIONS PROCESS INTEGRATION ASSESSMENT AND PLANNING
126	FEI INTERNAL COMMUNICATIONS DELIVERY
130	FEI EXTERNAL RELATIONS PLANS DEVELOPED
133	FEI TECHNOLOGY DESIGNED, BUILT AND TESTED
148	METER UPGRADES PREPARATION FOR DEPLOYMENT COMPLETED
221	TRAINING PLANNING AND READINESS COMPLETED
241	**DEPLOY AMI TECHNOLOGY / BILLING SYSTEM INTEGRATION**
242	AMI TECHNOLOGY DESIGNED, BUILT, INTEGRATED AND TESTED
263	SAP INTEGRATION DESIGNED, BUILT AND TESTED
265	SENSUS ANALYTICS SYSTEMS ACCEPTANCE TEST CONDUCTED



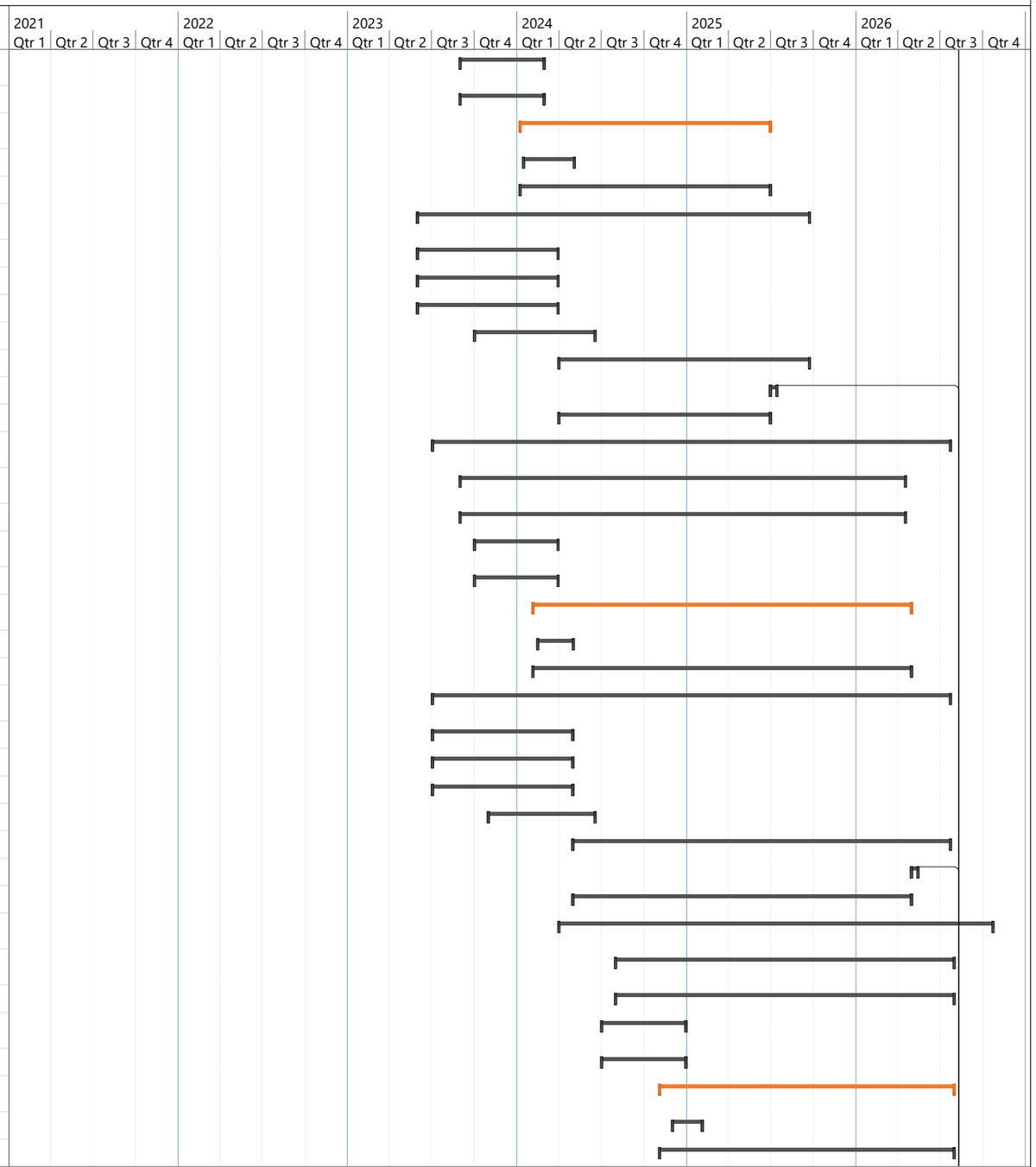
Gas AMI Project Preliminary Plan

ID	Task Name
267	END TO END INTEGRATION TESTING CONDUCTED
269	ACCEPTANCE TESTING AND DEPLOYMENT COMPLETED
271	DEPLOYMENT REGION 1: LOWER MAINLAND SOUTH
272	PROCUREMENT
273	REGIONAL PROCUREMENT ACTIVITIES EXECUTED
351	NETWORK INSTALLATION
352	AMI TECHNOLOGY BUILT & TESTED: REGION 1 FLEXNET FAN & NON-METER SENSORS DEPLOYED
357	METER UPGRADES
358	FACILITY, HANDHELDS, EQUIPMENT AND VEHICLES READINESS CONDUCTED
371	METER UPGRADES INSTALLED (METERS, REGULATORS, BYPASS VALVES)
395	PEOPLE AND PROCESS CHANGE MANAGEMENT
396	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
403	FEI INTERNAL COMMUNICATIONS ISSUED
407	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
411	REGIONAL TRAINING DELIVERED
422	FEI OPERATIONS PROCESSES INTEGRATED
430	REGION 1 ACCEPTANCE CRITERIA MET
432	REGION 1 STABILIZED
447	DEPLOYMENT REGION 4: SOUTH INTERIOR
448	PROCUREMENT
449	REGIONAL PROCUREMENT ACTIVITIES EXECUTED
545	NETWORK INSTALLATION
546	AMI TECHNOLOGY BUILT & TESTED: REGION 4 FLEXNET FAN & NON-METER SENSORS DEPLOYED
551	METER UPGRADES
552	FACILITY, HANDHELDS, EQUIPMENT AND VEHICLES READINESS CONDUCTED
565	METER UPGRADES INSTALLED (METERS, REGULATORS, BYPASS VALVES)
595	PEOPLE AND PROCESS CHANGE MANAGEMENT
596	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
603	FEI INTERNAL COMMUNICATIONS ISSUED
607	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
611	REGIONAL TRAINING DELIVERED
622	FEI OPERATIONS PROCESSES INTEGRATED
630	REGION 4 ACCEPTANCE CRITERIA MET
632	REGION 4 STABILIZED
649	DEPLOYMENT REGION 3: NORTH INTERIOR
650	PROCUREMENT
651	REGIONAL PROCUREMENT ACTIVITIES EXECUTED



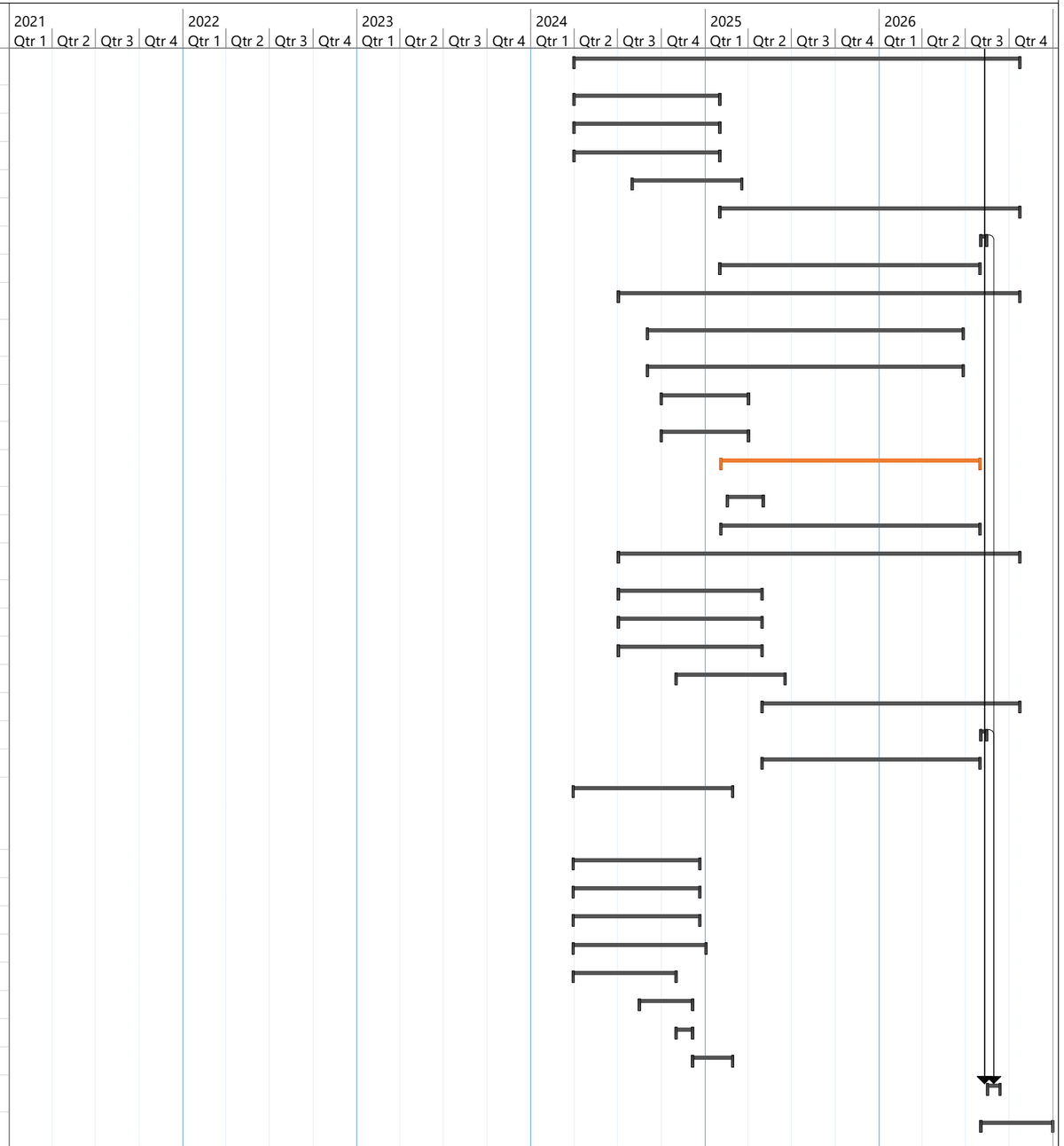
Gas AMI Project Preliminary Plan

ID	Task Name
720	**NETWORK INSTALLATION**
721	AMI TECHNOLOGY BUILT & TESTED: REGION 3 FLEXNET FAN & NON-METER SENSORS DEPLOYED
726	**METER UPGRADES**
727	FACILITY, HANDHELDS, EQUIPMENT AND VEHICLES READINESS CONDUCTED
740	METER UPGRADES INSTALLED (METERS, REGULATORS, BYPASS VALVES)
761	**PEOPLE AND PROCESS CHANGE MANAGEMENT**
762	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
769	FEI INTERNAL COMMUNICATIONS ISSUED
773	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
777	REGIONAL TRAINING DELIVERED
788	FEI OPERATIONS PROCESSES INTEGRATED
796	REGION 3 ACCEPTANCE CRITERIA MET
798	REGION 3 STABILIZED
813	**DEPLOYMENT REGION 5: VANCOUVER ISLAND**
814	**PROCUREMENT**
815	REGIONAL PROCUREMENT ACTIVITIES EXECUTED
905	**NETWORK INSTALLATION**
906	AMI TECHNOLOGY BUILT & TESTED: REGION 5 FLEXNET FAN & NON-METER SENSORS DEPLOYED
911	**METER UPGRADES**
912	FACILITY, HANDHELDS, EQUIPMENT AND VEHICLES READINESS CONDUCTED
925	METER UPGRADES INSTALLED (METERS, REGULATORS, BYPASS VALVES)
953	**PEOPLE AND PROCESS CHANGE MANAGEMENT**
954	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
961	FEI INTERNAL COMMUNICATIONS ISSUED
965	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
969	REGIONAL TRAINING DELIVERED
980	FEI OPERATIONS PROCESSES INTEGRATED
988	REGION 5 ACCEPTANCE CRITERIA MET
990	REGION 5 STABILIZED
1005	**DEPLOYMENT REGION 2: LOWER MAINLAND NORTH**
1006	**PROCUREMENT**
1007	REGIONAL PROCUREMENT ACTIVITIES EXECUTED
1079	**NETWORK INSTALLATION**
1080	AMI TECHNOLOGY BUILT & TESTED: REGION 2 FLEXNET FAN & NON-METER SENSORS DEPLOYED
1085	**METER UPGRADES**
1086	FACILITY, HANDHELDS, EQUIPMENT AND VEHICLES READINESS CONDUCTED
1097	METER UPGRADES INSTALLED (METERS, REGULATORS, BYPASS VALVES)



Gas AMI Project Preliminary Plan

ID	Task Name
1121	**PEOPLE AND PROCESS CHANGE MANAGEMENT**
1122	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
1129	FEI INTERNAL COMMUNICATIONS ISSUED
1133	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
1137	REGIONAL TRAINING DELIVERED
1148	FEI OPERATIONS PROCESSES INTEGRATED
1156	REGION 2 ACCEPTANCE CRITERIA MET
1158	REGION 2 STABILIZED
1175	**DEPLOYMENT REGION 6: KOOTENAYS**
1176	**PROCUREMENT**
1177	REGIONAL PROCUREMENT ACTIVITIES EXECUTED
1246	**NETWORK INSTALLATION**
1247	AMI TECHNOLOGY BUILT & TESTED: REGION 6 FLEXNET FAN & NON-METER SENSORS DEPLOYED
1252	**METER UPGRADES**
1253	FACILITY, HANDHELDS, EQUIPMENT AND VEHICLES READINESS CONDUCTED
1266	METER UPGRADES INSTALLED (METERS, REGULATORS, BYPASS VALVES)
1287	**PEOPLE AND PROCESS CHANGE MANAGEMENT**
1288	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
1295	FEI INTERNAL COMMUNICATIONS ISSUED
1299	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
1303	REGIONAL TRAINING DELIVERED
1314	FEI OPERATIONS PROCESSES INTEGRATED
1322	REGION 6 ACCEPTANCE CRITERIA MET
1324	REGION 6 STABILIZED
1341	**DEPLOYMENT: ENTERPRISE DATA REPOSITORY, CUSTOMER PORTAL, LEAK DETECTION**
1342	FEI CHANGE MANAGEMENT DEPLOYED & MONITORED
1349	FEI INTERNAL COMMUNICATIONS ISSUED
1353	FEI EXTERNAL RELATIONS COMMUNICATIONS ISSUED
1356	FEI OPERATIONS PROCESSES INTEGRATED
1361	FEI PEOPLE & PROCESS TRAINING DELIVERED
1380	ACCEPTANCE TESTING EXECUTED
1382	DEPLOYMENT PLANNING & CUTOVER COMPLETED
1385	STABILIZATION
1389	**FINAL ACCEPTANCE MET**
1392	**CLOSE OUT**



Attachment 31.3

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)

Attachment 33.2

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)

Attachment 36.2

Advanced Gas Meters project

Consultation, Engagement and Communications Plan – Project Deployment

Overview

The Advanced Gas Meters project (AMI) proposes to upgrade FortisBC's (FEI) gas meters to new advanced meters. FEI recognizes the importance of meaningful consultation, engagement and communication on its projects.

This plan intends to guide consultation, engagement and communication tactics throughout the Project's deployment phase. It will continue to be refined as the project progresses, and will incorporate feedback received from customers throughout ongoing engagement.

Consultation, Engagement and Communication Objectives

To create awareness of AMI with customers, stakeholders, Indigenous communities and the public, which includes:

- Proactively providing balanced and objective project information.
- Communicating and engaging effectively on the benefits of the new meters, and addressing concerns or providing explanations when unable to do so.
- Creating opportunities for customers, communities and stakeholders to provide feedback.

Sequencing

Activities during this phase support engagement and communication throughout deployment.

Milestone	Audience	Process	Timeline
BCUC Review Period	FEI Customers	**CPCN filed with BCUC** **Customer notifications of BCUC application, including:** • Print, Project webpage updates, digital ads, social media content and notification letters to Indigenous communities • Ongoing consultation and engagement, including responding to customer inquiries and municipal discussions regarding joint-use opportunities • Create and maintain communications materials, such as website and information cards	May 5 2021 – Q2 2022
	Indigenous Communities	• Indigenous engagement, including notifications and information sharing with Indigenous community leaders regarding Project milestones.	

Post Decision	FEI Customers	**Tiered Outreach Strategy** FEI will apply a tiered communications strategy to engage customers, beginning with a general campaign to build broad Project awareness, followed by targeted communications and engagement activities specific to regional deployment, and finally engagement with individual customers as required throughout the Project. • **Tier I (General):** **Activities will take place from BCUC decision and throughout deployment, and are intended to capture all FEI customers** ○ Project approval communication (social media, project webpage) ▪ Regularly scheduled project webpage updates and social media posts ongoing throughout deployment ○ Project webpage, social and digital media campaigns ▪ Building project awareness and providing regular updates ▪ Deployment updates – including regional timelines • **Tier II (Targeted and Regional):** ○ Customer direct-mailers ▪ Community specific in advance of deployment to encourage appointment scheduling, re-introducing AMI project and providing information on what customers can expect ○ Print and Digital Advertising: ▪ Social media and local newspaper updates regarding regional deployment ○ FortisBC Local Community Events: ▪ Attend community events with FEI staff to engage the public, educate about the project and schedule appointments ○ Information Sessions: ▪ Virtual and/or In-Person information sessions leading up to and throughout deployment to engage customers and stakeholders across the FEI service territory. • **Tier III (Customer-specific)** ○ Contact Centre appointment outreach to complement Tier II engagement with communities. Includes outreach by phone, letter and email to encourage appointment scheduling ○ Customer communication ▪ Provide info-card with relevant information to customers about the Project's next steps and what customers can expect going forward. ○ Engage customers with follow-up questions about AMI to inform and educate about Project benefits ○ Provide customer engagement training for deployment vendor	BCUC Decision - Project Closeout

Advanced Gas Meters project

Consultation, Engagement and Communications Plan – Project Deployment

Milestone	Audience	Process	Timeline
Post Decision	Indigenous Communities	**In addition to standard customer communication activities, all Indigenous communities will be engaged with the activities identified below.** ○ Early engagement to build meaningful relationships, including letters, meetings, and info sessions as required or requested ○ Continued engagement from pre-deployment to post-deployment to ensure Indigenous communities are informed and feedback garnered ○ Leverage existing relationships with Indigenous communities to better understand Indigenous communities current needs and apply lessons learned from electrical meter installation project ○ Execute socio-economic activities ○ Work with Indigenous communities to identify community representative(s) and their role in helping facilitate the respectful entry into Indigenous communities by the deployment crews ○ Work with contractor to reduce community impact through deployment schedule and community representative engagement ○ Contractor and Project leadership team to complete Indigenous awareness training	BCUC Decision – Project Closeout
Ongoing/Post Decision	Local Government	• Continue to engage municipalities and locally elected representatives about the Project throughout deployment • Meetings and council presentations • Distribute project fact-sheets to local governments and community offices to support deployment ○ Engagement on network base stations and joint-use opportunities	Ongoing
Ongoing/Post Decision	FEI Employees	• Continue to engage employees to inform employees about the Project. • Provide opportunities for feedback to help inform future engagement and communication activities.	Ongoing

Attachment 37.3

AMI Indigenous Engagement Log

Indigenous Groups	Date	Engagement Type	Location	Initiated By	Summary	Follow-Up Required?	Follow-Up Completed? (date)	Additional Comments
All Indigenous Groups	3-Oct-19	Mailed Letter	54 Indigenous Groups	FEI	Mailed Project Initial Notification letter	Yes	Yes; Oct-19-Nov-19	Follow up phone calls and emails
Aitchelitz Band	15-Oct-19	E-Mail	Chilliwack	External	Skowkale, Aitchelitz and Yakweakwioose (SAY) Lands Office contacted FEI 15-Oct-19 requesting meeting	Yes	Yes; 23-Oct-19	Waiting to hear back from SAY about best date/time for meeting. Additional follow-up required.
Skowkale First Nation	15-Oct-19	E-Mail	Sardis	External	SAY Lands Office contacted FEI 15-Oct-19 requesting meeting	Yes	23-Oct-19	Waiting to hear back from SAY Land Office about best date/time for meeting.
Yakweakwioose Indian Band	15-Oct-19	E-Mail	Sardis	External	SAY Lands Office contacted FEI 15-Oct-19 requesting meeting	Yes	Yes; 23-Oct-19	Waiting to hear back from SAY about best date/time for meeting. Additional follow-up required.
Okanagan Indian Band	16-Oct-19	E-Mail	Vernon	External	On16-Oct-19 requested meeting on 7-Nov-19 to discuss AMI	Yes	Yes; 1-Nov-19 meeting	7-Nov-19 meeting confirmed (FortisBC Indigenous Relations & Community Investment to attend)
Okanagan Indian Band	16-Oct-19	E-Mail	Vernon	FEI	Meeting confirmed for 7-Nov-19	No	N/A	
Coldwater Indian Band	21-Oct-19	E-Mail	Merritt	External	Meeting request for 27-Nov-21 (Chief and Council Mtg.)	Yes	Yes; 27-Nov-19 Mtg. was tentatively confirmed in 22-Oct-19 email	
Coldwater Indian Band	22-Oct-19	E-Mail	Merritt	FEI	27-Nov-19 Mtg. confirmed	No	N/A	
Aitchelitz Band	23-Oct-19	E-Mail	Chilliwack	FEI	Followed up about potential meeting dates (no reply)	Yes	Yes; 1-Nov-19	Waiting to hear back from SAY about best date/time for meeting. Additional follow-up required.
Coldwater Indian Band	23-Oct-19	E-Mail	Merritt	FEI	Email to clarify time of 27-Nov-19 meeting	No	N/A	
Osoyoos Indian Band	23-Oct-19	Phone Call	Oliver	FEI	Spoke to reception 29-Oct-19 who indicated letter should be sent	Yes	Yes; Letter sent	Letter sent as requested
Penticton Indian Band	23-Oct-19	Phone Call	Penticton	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Skowkale First Nation	23-Oct-19	E-Mail	Chilliwack	FEI	Followed up about potential meeting dates (no reply)	No	N/A	Waiting to hear back from SAY Land Office about best date/time for meeting.
Williams Lake Indian Band	23-Oct-19	E-Mail	Williams Lake	External	Email received on 23-Oct-19 requesting discussion of potential community engagement meeting	Yes	Yes; 23-Oct-19	No response received back regarding potential community engagement
Williams Lake Indian Band	23-Oct-19	E-Mail	Williams Lake	FEI	Follow-up email sent requesting potential dates for meeting/discussion (no reply)	Yes	Yes; 01-Nov-19	No response received back regarding potential community engagement
Yakweakwioose Indian Band	23-Oct-19	E-Mail	Chilliwack	FEI	Followed up about potential meeting dates (no reply)	Yes	Yes; 1-Nov-19	Waiting to hear back from SAY about best date/time for meeting. Additional follow-up required.
Coldwater Indian Band	24-Oct-19	Email	Merritt	External	Reply from Coldwater Indian Band, indicating time of meeting would be known closer to date of meeting	No	N/A	
Adams Lake Indian Band	28-Oct-19	Phone Call	Chase	FEI	Requested e-copy of AMI letter	Yes	Yes; 28-Oct-19	
Chawathil First Nation	28-Oct-19	Phone Call	Hope	FEI	Discussed. No concerns at the moment.	No	N/A	
Cheam First Nation	28-Oct-19	Phone Call	Rosedale	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Coldwater Indian Band	28-Oct-19	Phone Call	Merritt	External	On 21-Oct-19, requested meeting - presentation to Chief Council on 27-Nov-19	Yes	Yes; 27-Nov-19 meeting	On 22-Oct-19, the 27-Nov-19 meeting was confirmed. Time of meeting to be determined in coming weeks.
Cowichan Tribes	28-Oct-19	Phone Call	Duncan	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Esquimalt Nation	28-Oct-19	Phone Call	Victoria	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Fort Nelson First Nation	28-Oct-19	Phone Call	Fort Nelson	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Halalt First Nation	28-Oct-19	Phone Call	Chemainus	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Hupacasath First Nation	28-Oct-19	Phone Call	Port Alberni	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Katzie First Nation	28-Oct-19	Phone Call	Pitt Meadows	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
K'ómoks First Nation	28-Oct-19	Phone Call	Courtenay	FEI	Left message with reception	No	N/A	
Kwaw Kwaw Apilt First Nation	28-Oct-19	Phone Call	Chilliwack	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	

AMI Indigenous Engagement Log								
Indigenous Groups	Date	Engagement Type	Location	Initiated By	Summary	Follow-Up Required?	Follow-Up Completed? (date)	Additional Comments
Lheidli T'enneh First Nation	28-Oct-19	Phone Call	Prince George	FEI	Requested e-copy of AMI letter	Yes	Yes ; 28-Oct-19	
Lhtako Dene First Nation	28-Oct-19	Phone Call	Quesnel	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Matsqui First Nation	28-Oct-19	Phone Call	Matsqui	FEI	Left message with reception	No	N/A	
Musqueam Indian Band	28-Oct-19	Phone Call	Vancouver	FEI	Requested e-copy of letter to forward to Chief/Council	Yes	Yes ; 28-Oct-19	
Neskonlith Indian Band	28-Oct-19	Phone Call	Chase	FEI	Indicated that letter should be sent.	Yes	Yes; 30-Oct-19	Sent email copy of AMI letter on 29-Oct-19 as requested
Prophet River First Nation	28-Oct-19	Phone Call	Fort Nelson	FEI	Requested e-copy of AMI letter	Yes	Yes ; 28-Oct-19	
Seabird Island Indian Band	28-Oct-19	Phone Call	Agassiz	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Semiahmoo First Nation	28-Oct-19	Phone Call	Surrey	FEI	Requested e-copy of AMI letter	Yes	Yes ; 28-Oct-19	Sent email copy of AMI letter as requested
Shíshálh First Nation	28-Oct-19	Phone Call	Sechelt	FEI	Requested e-copy of AMI letter	Yes	Yes ; 28-Oct-19	
Shxwhá:y Village (skyway)	28-Oct-19	Phone Call	Chilliwack	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Skeetchestn Indian Band	28-Oct-19	Phone Call	Savona	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Skwah First Nation	28-Oct-19	Phone Call	Chilliwack	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Snuneymuxw First Nation	28-Oct-19	Phone Call	Nanaimo	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Songhees First Nation	28-Oct-19	Phone Call	Victoria	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Soowahlie Indian Band	28-Oct-19	Phone Call	Cultus Lake	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Splatsin First Nation	28-Oct-19	Phone Call	Enderby	FEI	Request to email AMI letter	Yes	Yes; 29-Oct-19	
Squiala First Nation	28-Oct-19	Phone Call	Chilliwack	FEI	Left message with reception	No	N/A	
Stz'uminus First Nation	28-Oct-19	Phone Call	Ladysmith	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Sumas First Nation	28-Oct-19	Phone Call	Abbotsford	External	Sumas Administrative office requested e-copy of AMI letter	Yes	Yes ; 28-Oct-19	
Sumas First Nation	28-Oct-19	Email	Abbotsford	FEI	E-copy of AMI letter sent to Sumas Administrative office requested	No	N/A	
T'Sou-ke First Nation	28-Oct-19	Phone Call	Sooke	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Tk'emlúps te Secwépemc	28-Oct-19	Phone Call	Kamloops	FEI	Left message with reception	No	N/A	
Tsartlip First Nation	28-Oct-19	Phone Call	Brentwood Bay	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Tsawwassen First Nation	28-Oct-19	Phone Call	Delta	FEI	Left message with reception; requested e-copy of letter	No	Yes ; 28-Oct-19	Sent email copy of AMI letter as requested 8-Oct -19
Tseshaht First Nation	28-Oct-19	Phone Call	Port Alberni	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Tseycum First Nation	28-Oct-19	Phone Call	Sidney	FEI	Left message with reception	No	N/A	
Tzeachten First Nation	28-Oct-19	Phone Call	Chilliwack	FEI	No answer. Unable to leave message (did not go to voicemail)	No	N/A	
Union Bar Indian Band	28-Oct-19	Phone Call	Hope	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Wei Wai Kum Nation	28-Oct-19	Phone Call	Campbell River	External	Wei Wai Kum administration office requested e-copy of AMI letter	Yes	Yes ; 28-Oct-19	
Wei Wai Kum Nation	28-Oct-19	Email	Campbell River	FEI	Sent e-copy of AMI letter	No	N/A	
Westbank First Nation	28-Oct-19	Phone Call	Westbank	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
ʔaq'qm (St. Mary's Indian Band)	28-Oct-19	Phone Call	Cranbrook	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Little Shuswap Lake Indian Band	29-Oct-19	Phone Call	Chase	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Lower Nicola Indian Band	29-Oct-19	Phone Call	Merritt	FEI	Email received in response to Oct. 29 voicemail requesting follow-up	Yes	Yes; 30-Oct-19	Sent email copy of AMI letter on 30-Oct-19

AMI Indigenous Engagement Log								
Indigenous Groups	**Date**	**Engagement Type**	**Location**	**Initiated By**	**Summary**	**Follow-Up Required?**	**Follow-Up Completed? (date)**	**Additional Comments**
Osoyoos Indian Band	30-Oct-19	E-Mail	Oliver	External	Email to Vanessa Connolly requesting meeting with Chief/Council for 25-Nov-19	Yes	Yes; 25-Nov-19 meeting was tentatively scheduled	
Tseshaht First Nation	31-Oct-19	Phone Call	Port Alberni	External	Received phone call on 31-Oct-19 regarding AMI. Requested e-copy of letter. They will follow-up if needed.	Yes	Yes; 31-Oct-19	
Tseshaht First Nation	31-Oct-19	Phone Call	Port Alberni	External	E-copy of AMI letter sent 31-Oct-19	No	N/A	
Aitchelitz Band	1-Nov-19	E-Mail	Chilliwack	FEI	Followed up about potential meeting dates. Indicated she will follow-up with dates week of 4-Nov-19	No	N/A	
Osoyoos Indian Band	1-Nov-19	E-Mail	Oliver	FEI	Follow-up email sent on 1-Nov-19 meeting tentatively scheduled for 25-Nov-19 with Chief and Council	No		
Skowkale First Nation	1-Nov-19	E-Mail	Chilliwack	FEI	Followed up about potential meeting dates. Indicated will follow-up with dates week of 4-Nov-19	No	N/A	
Williams Lake Indian Band	1-Nov-19	E-Mail	Williams Lake		2nd follow-up email sent requesting potential dates	No	N/A	No response received yet
Yakweakwioose Indian Band	1-Nov-19	E-Mail	Chilliwack	FEI	Followed up about potential meeting dates. Indicated will follow-up with dates week of 4-Nov-19	No	N/A	
Okanagan Indian Band	7-Nov-19	In-Person Meeting	Vernon	External	Met with OKIB to have initial conversation about AMI Project. OKIB had a number of questions we said we would follow-up on.	Yes	Yes; 29-Nov-19 email	
Coldwater Indian Band	13-Nov-19	E-mail	Merritt	FEI	Follow-up to check 27-Nov-19 meeting time	No	N/A	
Coldwater Indian Band	14-Nov-19	E-mail	Merritt	External	Meeting time (7pm) confirmed for 27-Nov-19 meeting	No	N/A	
Coldwater Indian Band	14-Nov-19	Email	Merritt	FEI	Request to postpone meeting until 2020	No	N/A	
Coldwater Indian band	14-Nov-19	Email	Merritt	External	Request to postpone meeting until 2020 acknowledged	Yes	Yes; new meeting scheduled for 8-Apr-20	
Osoyoos Indian Band	19-Nov-19	E-Mail	Oliver	FEI	25-Nov-19 meeting date pushed to early 2020	Yes	Yes; 17-Dec-19 email	
Tsawout First Nation	21-Nov-19	Phone Call	Saanichton	FEI	Left Voicemail indicating FEI open to answering questions on AMI	No	N/A	
Squamish Nation	26-Nov-19	E-Mail	North Vancouver	FEI	Emailed SN with follow-up on Oct. letter, indicating would be happy to answer any questions about AMI	No	N/A	
Tsleil-Waututh First Nation	26-Nov-19	E-Mail	North Vancouver	FEI	Emailed TWN with follow-up on 3-Oct-19 letter, indicating would be happy to answer any questions about AMI	No	N/A	
Okanagan Indian Band	29-Nov-19	E-Mail	Vernon	External	Email providing response to inquiries raised at 7-Nov-19 meeting	No	N/A	
Coldwater Indian Band	17-Dec-19	E-Mail	Merritt	FEI	New meeting dates requested	No	N/A	
Coldwater Indian Band	17-Dec-19	E-Mail	Merritt	External	Potential meeting dates proposed for January/February	Yes	Yes; Followed-up in 13-Jan-19 E-Mail	
Osoyoos Indian Band	17-Dec-19	E-Mail	Oliver	FEI	FEI requested potential meeting dates. No reply received	Yes	Yes; 24-Jan-20 email	
Coldwater Indian Band	13-Jan-20	E-Mail	Merritt	FEI	Due to weather conditions alternative dates requested for meeting deeper into Q1 2020	Yes	Yes; 14-Jan-20	
Coldwater Indian band	14-Jan-20	E-Mail	Merritt	External	Propose 26-Feb-20 at 6pm as new meeting date	Yes	Yes; 14-Jan-20	Confirm new meeting dates
Coldwater Indian Band	14-Jan-20	E-Mail	Merritt	FEI	26-Feb-20 meeting date confirmed	Yes	Yes; 7-Feb-20	Confirm meeting dates
Aitchelitz Band	24-Jan-20	E-Mail	Chilliwack	FEI	Followed up to inquire if there was still interest in a meeting.	No	N/A	
Osoyoos Indian Band	24-Jan-20	E-Mail	Oliver	FEI	Follow-up email to see if there is still interest in meeting on AMI. No reply received	No	N/A	
Skowkale First Nation	24-Jan-20	E-Mail	Chilliwack	FEI	Alpha	No	N/A	
Williams Lake Indian Band	24-Jan-20	E-Mail	Williams Lake	FEI	Followed up to inquire if there was still interest in a meeting.	No		
Yakweakwioose Indian Band	24-Jan-20	E-Mail	Chilliwack	FEI	Followed up to inquire if there was still interest in a meeting.	No	N/A	
Coldwater Indian Band	7-Feb-20	E-Mail	Merritt	FEI	Re-confirming 26-Feb-20 meeting date	No	N/A	

AMI Indigenous Engagement Log								
Indigenous Groups	**Date**	**Engagement Type**	**Location**	**Initiated By**	**Summary**	**Follow-Up Required?**	**Follow-Up Completed? (date)**	**Additional Comments**
Coldwater Indian Band	7-Feb-20	E-Mail	Merritt	External	26-Feb-20 is re-confirmed by Coldwater Indian Band	No	N/A	
Coldwater Indian band	21-Feb-20	E-Mail	Merritt	External	Request from Coldwater to re-schedule 26-Mar-20 meeting	Yes;	Yes; Followed-up Feb. 24, 26, 2020	
Coldwater Indian Band	24-Feb-20	E-Mail	Merritt	FEI	Additional discussion regarding potential meeting dates	No	N/A	
Coldwater Indian Band	26-Feb-20	E-Mail	Merritt	External	Additional meeting dates proposed	Yes	Yes; Followed-up on 26-Feb-20 to confirm new meeting date	
Coldwater Indian Band	26-Feb-20	E-Mail	Merritt	FEI	Request to confirm 8-Apr-20, 7pm as revised meeting date	No	N/A	
Coldwater Indian Band	26-Feb-20	E-Mail	Merritt	FEI	8-Apr-20 Meeting date confirmed	No	N/A	
Coldwater Indian Band	3-Mar-20	E-Mail	Merritt	External	Coldwater requested postponement of 8-Apr-20 Meeting due to COVID. They will follow up with alternative dates	No	N/A	Awaiting Coldwater to contact FEI with alternative dates for meeting.
Coldwater Indian Band	11-May-20	E-Mail	Merritt	External	Coldwater requested13-May-20 Meeting	Yes	Yes; 13-May-20 Meeting	Coldwater sent Zoom e-invite to FEI
Coldwater Indian Band	13-May-20	Conference Call	Merritt	External	Telephone meeting with Coldwater on 13-May-20 Meeting with Chief & Council. Provided current details on the Project and addressed questions.	Yes	Yes; 24-Feb-21 (update letter)	Questions on issues related to safety and access and were addressed by FEI during the call. Coldwater Indian Band also indicated a preference for working through a community appointed liaison during deployment and FEI was able to confirm that this can be arranged if the Project proceeds. Further engagement closer to deployment.
All Indigenous Groups	9-Feb-21	Emailed Letter	54 Indigenous Groups	FEI	Emailed Project Notification letter that included information about the Feb 23 and Feb 24, 2021 Public Information Sessions	Yes	No; <30-Apr-21	Follow up prior to 30-Apr-21 to touch base with Indigenous groups to solicit any questions to date and provide any further updates
Stz'uminus First Nation	10-Feb-21	Email	Ladysmith	External	Maureen Tommy inquired about how many FEI gas customers resided in Stz'uminus First Nation community	Yes	Yes; 19-Feb-21	
Union Bar Indian Band	15-Feb-21	Phone Call	Hope	FEI	Left voicemail regarding the 23-Feb-21 & 24-Feb-21 Public Information Sessions	No	N/A	
Union Bar Indian Band	18-Feb-21	Email	Hope	FEI	Sent 2nd AMI update letter via email to economic development representative for Union Bar (Vivian Ferguson, Sto: lo Tribal Council)	No	N/A	Sent 2nd AMI update letter via email to Vivian Ferguson of Stolo Tribal Council as indicated on the Union Bar Indian Band website
Stz'uminus First Nation	19-Feb-21	Email	Ladysmith	FEI	Informed Maureen Tommy that a new GIS report did not identify any customers, but we were reviewing the community boundaries to confirm	Yes	Yes; 26-Feb-21	Followed up with FortisBC GIS team to confirm community boundaries and gas customers
Skeetchestn Indian Band	23-Feb-21	Email	Savona	External	Rochelle Porter, Public Works & Housing Manager, requested 24-Feb-21 Public Information Session registration	Yes	Yes: 24-Feb-21	
Skeetchestn Indian Band	24-Feb-21	Email	Savona	FEI	24-Feb-21 Public Information Session registration sent to Rochelle Porter	No	N/A	
Skeetchestn Indian Band	24-Feb-21	Email	Savona	External	Rochelle Porter requested PDF of Public information Session 24-Feb-21 presentation	Yes	Yes; Mar-3-21	Sent PDF of Public information Session 24-Feb-21 presentation
Squiala First Nation	24-Feb-21	Email	Chilliwack	External	Request from Nikki Jackson, Lands Assistant, for 24-Feb 21 Public Information Session	Yes	Yes; 24-Feb 21	Registration URL sent for 24-Feb-21 Public Information Session
Squiala First Nation	24-Feb-21	Email	Chilliwack	FEI	Sent URL for 24-Feb 21 Public Information Session as request by Nikki Jackson, Lands Assistant	No	N/A	
Stz'uminus First Nation	26-Feb-21	Email	Ladysmith	FEI	Informed Maureen Tommy that our GIS records indicated that there are no FEI gas customers in their community	No	N/A	
Skeetchestn Indian Band	3-Mar-21	Email	Savona	FEI	PDF of 24-Feb-21 Pubic Information Session presentation sent to Rochelle Porter	No	N/A	
All Indigenous Groups	31-Aug-21	Emailed Letter	54 Indigenous Groups	FEI	Emailed Project Notification letter that identified BCUC CPCN application in May 2021	No	N/A	
Okanogan Indian Band	1-Sep-21	Email	Vernon	FEI	OKIB request for FEI's customer terms & conditions as well as more information on the safety features and benefits of the AMI meter	Yes	1-Sep-21	OKIB contact: Lee Anne Cameron Director of Lands Okanagan Indian Band
Okanogan Indian Band	1-Sep-21	Email	Vernon	FEI	FEI inquiring if OKIB would like a presentation or email or both with the information requested	Yes	1-Sep-21	F/U with requested information

AMI Indigenous Engagement Log								
Indigenous Groups	**Date**	**Engagement Type**	**Location**	**Initiated By**	**Summary**	**Follow-Up Required?**	**Follow-Up Completed? (date)**	**Additional Comments**
Okanogan Indian Band	1-Sep-21	Email	Vernon	FEI	OKIB requested an email response to their information request and then they will decide if a presentation is needed	Yes	1-Sep-21	OKIB contact: Lee Anne Cameron Director of Lands Okanagan Indian Band
Okanogan Indian Band	14-Sep-21	Email	Vernon	FEI	Letter sent elaborating further the safety features and benefits, Customer General Terms & Conditions provided	Yes	1-Sep-21	Follow up at a later date to ensure OKIB received the information and if any further questions