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July 5, 2022

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC
V6Z 2N3

Attention: Mr. Patrick Wruck, Commission Secretary

Dear Mr. Wruck:

Re: FortisBC Energy Inc. (FEI or the Company)

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

Evidentiary Update to the Application, dated July 5, 2022

On May 5, 2021, FEI filed the above-referenced Application with the British Columbia Utilities Commission (BCUC). A procedural conference was held on March 11, 2022 wherein FEI indicated that it may be appropriate to file an evidentiary update to the Application. By the deadline of June 9, 2022, FEI submitted notice of its intent to file an evidentiary update (Exhibit B-25). This letter and the enclosed appendices constitute that evidentiary update (the Evidentiary Update).

In this Evidentiary Update, FEI has included a black line version of the revised pages in Sections 1, 4, and 6 of the Application (Appendix A) showing the numeric changes associated with the Evidentiary Update. A clean version of the revised pages in Sections 1, 4 and 6 is included as Appendix B. The updated Excel spreadsheet financial analyses for the AMI Project, Baseline and AMR Alternative scenarios (i.e., the working Excel models as originally included in the Confidential Attachment 1 of Exhibit B-2 of the Application) are included as Confidential Appendix C to this filing. All input costs that were updated have been indicated with yellow highlighting in the Excel models in Confidential Appendix C. Of note, although the deployment schedule for the AMI Project has shifted, FEI has not updated Section 5 of the Application as part of the Evidentiary Update. The fundamental activities and sequence as set out in Section 5.5.1 have not changed. As stated in Section 5.5.2, once BCUC approval is received, FEI will enter the Define phase of the AMI Project and issue a Notice to Proceed to Sensus and its to-be-selected Deployment Vendor. The initial deployment phase (Deploy AMI Technology/Billing System Integration) of the Project will begin 90 days following the beginning of the Define phase as originally contemplated in Table 5-2. The final AMI Project schedule and activities will be reported to the BCUC as part of its CPCN reporting requirements.

Subject to approval of the Application and the BCUC's determination of any associated reporting requirements, a final control budget for the AMI Project will be provided for purposes of comparing actual Project spending and progress to the control budget. As such, FEI does not anticipate providing any further evidentiary updates on the AMI Project as part of this regulatory process.

As noted above, FEI has included black line and clean versions where appropriate, of the following sections to help parties identify the changes made to the Application as a result of this Evidentiary Update.

Table 1: Revised Pages to the Application

Description	Revised Pages
Application, Section 1	Pages 7, 8
Application, Section 4	Pages 51 to 54; 63 to 66; 68
Application, Section 6	Pages 97 to 102; 105 to 107; 109; 113 to 118

Request for Confidential Treatment of Financial Schedules

FEI reiterates its request in the Application (Exhibit B-2, FEI Supplemental Information) that the BCUC hold the Excel spreadsheet models[1] on a confidential basis and that such information should remain confidential after the regulatory process for this Application is completed. The Excel spreadsheet models included in Appendix C to this Evidentiary Update provides updated cost estimates to those originally filed with the Application, including updated capital cost estimates for the Project. They should continue to be kept confidential on the basis that FEI is in the market negotiating with parties for the deployment of the Project. If the estimated costs for the work are disclosed, FEI reasonably expects that its negotiating position may be prejudiced.

1. Updates to the Costs in the Application

The two areas where changes have occurred that materially impact the costs set out in the Application are in the labour market and in the materials market. The changes in these two areas and resulting impacts on the financial analyses are described below.

1.1 Labour Market Conditions

Across BC, businesses are experiencing pressures with respect to the hiring and retention of employees due to a shortage of supply within the labour market in the province.[2] FEI is also experiencing these pressures. The Evidentiary Update reflects the impacts that these pressures have had on two sub-categories of labour costs: deployment labour (AMI and AMR) and contractor labour related to sustainment activities (Baseline and AMR):

[1] Exhibit B-2, Attachment 1.
[2] https://www.workbc.ca/getmedia/c43af36f-f408-4990-9ae1-c5b5f5f7be7a/BC_Labour_Market_Outlook_2021_9MB.pdf.aspx.

AMI Project

- **Deployment Labour** – As a result of the challenging labour market, FEI is forecasting higher deployment labour costs in the AMI financial analysis directly related to the following:

    - **Hourly rates for temporary field employees** – to recruit and retain qualified employees, FEI is forecasting higher hourly rates for employees hired to perform meter exchanges for the deployment period. The change is reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-1, AMI Cost Inputs, Schedule 2.1, Line 7 and 8, which amounts to an estimated increase of approximately 37 percent from the hourly rates originally reflected in the Application.
    - **Higher turnover rate** – FEI is also expecting a higher turnover rate for temporary field employees than originally forecast. This results in increased hiring and training costs. The ratio of supervisors and gas ticketed installers to internally trained installers has also been increased in the financial model as a result, allowing for additional field support during deployment. As part of this Evidentiary Update, FEI estimated an additional 12 percent of temporary field employees would need to be hired due to turnover, and as a result, increased the ratio of supervisors to temporary field employees by 1 and increased the number of full time managers by 1. These changes are reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-1, AMI Cost Inputs, Schedule 2.1, Line 4, 14, and 18, respectively.
    - **Decreased meter deployment productivity rate –** the productivity rate is the number of advanced meters expected to be installed per employee each day. The productivity rate has been slightly decreased in the financial analysis to reflect the higher employee turnover rate (resulting in more time recruiting, onboarding and training new employees) and also as a result of changing customer attitudes to field employees entering their homes. FEI's recent experience and feedback it has received suggest that customers are increasingly hesitant to have people in their homes and that it takes longer than traditionally was the case to gain access and conduct the necessary in-home activity (including for employees to don personal protective equipment for the comfort of both residents and employees). This change is reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-1, AMI Cost Inputs, Schedule 2.1, Line 3, which amounts to a 5 percent reduction in productivity over the amount originally reflected in the Application.

Baseline

- **Contractor Labour for Sustainment Activities** – FEI currently completes its meter exchanges using both FEI's internal labour and contractors (i.e., approximately 40 to 45 percent is completed by contractors, depending on the year). At the time of the original Application, the labour rates per meter exchanges were similar between FEI's internal labour and contractors; as such, FEI assumed the same labour rates per meter exchanges at that time. However, since filing the Application, FEI has experienced cost increases for work performed by contractors. Based on current average contractor rates for meter exchanges, the increase over the FEI internal labour rates (i.e., the assumption for the contractor labour rate in the original Application) is approximately

109 percent, which is reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-2, Baseline Cost Inputs, Schedule 2, Line 39 and 40.

AMR Alternative

- **Deployment Labour -** The AMR Alternative requires the deployment of AMR modules to existing meters and therefore faces the same deployment labour challenges (i.e., hourly rates for temporary field employees, higher turnover rate, and decreased meter deployment productivity rate) as described above in relation to the AMI Project scenario. The associated costs for the AMR Alternative have been adjusted accordingly in the Evidentiary Update. The change is reflected in the Evidentiary Update Confidential Appendix C in AMR Cost Inputs in Confidential Table 4-2 (as included originally in the Confidential Attachment 1 of Exhibit B-2, Schedule 3) and amounts to an overall increase of approximately 48 percent over the amount originally reflected in the Application.
- **Contractor Labour for Sustainment Activities –** Given the underlying meters for the AMR Alternative are still diaphragm meters (AMR module install to existing diaphragm meters), the increased contractor activities as well as the impact due to the higher contractor rates per activity for meter exchanges as described in the Baseline scenario above also impact the AMR Alternative. As such, the same change as for the Baseline scenario is also reflected in the Evidentiary Update Confidential Appendix C in AMR Cost Inputs in Confidential Table 4-2 (as included originally in the Confidential Attachment 1 of Exhibit B-2, Schedule 2, Line 39 and 40).

1.2 Materials Market Conditions

Manufacturing industries globally are experiencing supply chain disruptions and rising supplier costs linked to labour shortages, material availability, and logistical constraints. FEI has also experienced increased costs for materials. The Evidentiary Update reflects the impacts that these pressures have had on two sub-categories of material costs: diaphragm meters (Baseline and AMR); and bypass valves and regulators (all scenarios).

FEI notes that this cost escalation does not impact the advanced meters to be installed as part of the AMI Project and thus no changes are required to the AMI Project financial analysis meter costs as part of the Evidentiary Update. This is because FEI's fixed price contract with Sensus (which covers the supply of advanced meters, network and managed services) was negotiated prior to submission of the Application and includes fixed pricing for the above-noted items. That fixed pricing continues to provide certainty in costs and supply of advanced meters, network and managed services throughout the life of the AMI Project. FEI maintains fixed pricing under its contract with Sensus as long as the contractual deadline for removal of the condition precedent related to BCUC approval is satisfied by June 30, 2023.

AMI Project

- **Bypass Valves and Regulators** – As a result of the challenges noted above for manufacturing industries, FEI is experiencing increased costs for bypass valves and regulators, which need to be installed under all scenarios. The increased costs are reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-1, AMI Cost Inputs, Schedule 1, which amount to an increase of approximately 24

percent for the regulators and approximately 10 percent for the bypass valves during the AMI deployment years over the respective amounts originally reflected in the Application.

Baseline

- **Meters** – FEI has experienced increased costs for diaphragm meters, and therefore meter costs have increased in the Baseline financial analysis in the Evidentiary Update. Further, in FEI's recent experience, diaphragm meter delivery timelines required for operating the utility cannot be met, which ultimately impacts the viability of the Baseline scenario.[3] Even apart from experiencing their own labour and materials issues, or perhaps because of them, vendors have been switching their business models even more quickly than expected from the manufacture of such meters to the manufacture of ultrasonic meters. For the purposes of this analysis FEI has assumed the continued viability of the Baseline scenario, and as such the increased diaphragm meter costs are reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-2, Baseline Cost Inputs Schedule 1, Line 16 for the residential type diaphragm meters and Line 17 for the commercial type diaphragm meters with the increases of approximately 26 percent and 6 percent, respectively over the amount originally reflected in the Application, which was based on costs from 2020.
- **Bypass Valves and Regulators** – The Baseline is also impacted by the increasing costs for bypass valves and regulators, as described under the AMI scenario above. This cost increase is reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-2, Baseline Cost Inputs Schedule 1, Line 18 and 19, respectively.

AMR Alternative

- **Meters** – As the AMR Alternative also requires diaphragm meters, the discussion under Baseline scenario applies here as well. For the purposes of this analysis FEI has assumed the continued viability of the AMR Alternative, and as such the same increased diaphragm meter costs in the Baseline scenario are also reflected in the Evidentiary Update Confidential Appendix C AMR Cost Inputs in Confidential Table 4-2 (as included originally in the Confidential Attachment 1 of Exhibit B-2), Schedule 1, Line 16 and 17 for the residential and commercial type diaphragm meters, respectively.
- **Bypass Valves and Regulators** – The AMR Alternative is also impacted by the increasing costs for bypass valves and regulators, as described in both the AMI scenario and Baseline scenario above. This impact to the AMR scenario is reflected in the Evidentiary Update Confidential Appendix C AMR Cost Inputs in Confidential Table 4-2 (as included originally in the Confidential Attachment 1 of Exhibit B-2), Schedule 1, Line 18 and 19 for the regulators and bypass valves, respectively.

1.3 Total Labour and Material Cost Impact to the AMI Project

The impact of the cost increases in the two categories of labour and materials discussed above results in an increase of approximately $92 million to the total capital cost for the AMI Project

[3] See also FEI's response to RCIA IR1 10.2.

(over the pre-deployment and deployment period from 2021 to 2026), from $638.4 million in the Application to $730.8 million. This also results in an increase to the incremental levelized delivery rate impact over the 26-year analysis period due to the AMI Project (when compared to the Baseline scenario) of approximately 0.113 percent, from 0.125 percent in the Application to 0.238 percent.

2. Meter Exchange Dispensation

With this Evidentiary Update, FEI is also providing information on a development regarding Measurement Canada's (MC) policy for meter dispensation for gas utilities. The Application as filed expected the Company would receive the approval of MC, upon the BCUC's granting of a CPCN in respect of the Project, to dispense with meter exchanges in 2022. This expectation was based on the existing policy in place for electric utility deployments throughout Canada where utilities receive dispensations from MC meter exchange requirements upon approval of a project.[4]

MC has now set out the policy for meter dispensation specifically with respect to gas meters, adjusting the earlier practice adopted for electric utilities. In November of 2021, MC provided notice that "the temporary permission is effective for the specified implementation period." Since that notice, the MC policy for dispensation has been fully developed and confirms that a gas utility is only able to apply for meter dispensation for years in which mass meter deployment is to take place.

As, pursuant to this new policy, FEI must continue exchanging meters under its MC compliance sampling program until the year of mass deployment, the benefit contemplated in the Application of avoiding meter exchange costs in 2022 or 2023 will not be experienced. The loss of this benefit is now factored into the Evidentiary Update financial analysis. FEI notes that this lost benefit adds 0.204 percent to the levelized delivery rate impact of the AMI Project reflected in this Evidentiary Update, which is approximately 64 percent of the total increase as shown in Section 3 below.

Due to the rising costs and availability issues with diaphragm meters and as contemplated in the Application, FEI still plans to install advanced meters (with the radio turned off) instead of diaphragm meters beginning in 2023 as part of its compliance sampling program, and then return to the premises where this occurred during Project deployment in order to connect each meter to the network. The associated hours and costs to commission these advanced meters installed in 2023 (activate radio) is reflected in the Evidentiary Update Confidential Appendix C in Confidential Appendix G-1, AMI Cost Inputs, Schedule 2, Line 43. In the event the BCUC does not approve the Application, FEI will leave the radio turned off within each meter and the meter will continue to be read manually.

3. Summary of Cost Changes and Rate Impacts for the AMI Project

Table 2 below summarizes the changes to the incremental levelized delivery rate impact due to the increasing costs of labour and materials (as discussed in Section 1), as well as the

[4] MC did not have a policy in place for gas utility AMI deployments at the time of filing. The policy was developed throughout 2021 and FEI's understanding remained that the same policy would apply to gas utilities until it received notice otherwise in November of 2021.

impact of the change to the MC dispensation policy (as discussed in Section 2), compared to what was filed in the Application. It can be seen that, when combining the impact of increasing costs and the changes to the MC dispensation policy, the total incremental levelized delivery rate impact over the 26-year analysis period due to the AMI Project (when compared to the Baseline scenario) is increased by approximately 0.317 percent, from 0.125 percent in the original Application to 0.442 percent.

Table 2: Summary of Changes in Levelized Delivery Rate Impact

Line	Levelized Delivery Rate Impact (Over 26-year)	Levelized Rates	Percentage of Increase
1	As-Filed	0.125%	
2	Incremental Impact due to Increasing Labour and Material Costs	+0.113%	36%
3	Incremental Impact due to MC Dispensation policy	+0.204%	64%
4	Total Evidentiary Update	0.442%	100%

Table 3 below compares the net present value (NPV) between what was filed in the Application and this Evidentiary Update. It can be seen that the incremental revenue requirement has increased from $15.0 million to $38.3 million, and the incremental levelized delivery rate impact has increased from 0.125 percent to 0.442 percent.

Table 3: Comparison of AMI Project Financials (NPVs)

Financial Summary	AMI (As-Filed)	AMI (Evidentiary Update)	Changes
Capital Costs (NPV):			
Meter Capital	481.2	560.1	78.8
Project Management	35.2	35.2	-
Software Capital	9.1	9.1	-
Network Capital	17.1	17.1	-
Non-Meter Capital	3.6	3.6	-
AFUDC	12.7	16.0	3.3
Total Capital (NPV)	**558.9**	**641.1**	**82.2**
O&M Costs (NPV):			
Meter Reading Costs[1]	78.3	79.1	0.8
Operations, Contact Centre and Meter Shop O&M[2]	12.9	14.6	1.7
New O&M	97.9	97.9	-
Total O&M, incl. Capitalized Overhead (NPV)	**189.0**	**191.6**	**2.6**
Incremental Capital (NPV, $millions)	**186.05**	**206.9**	**20.9**
Incremental O&M (NPV, $millions)	**(134.48)**	**(135.5)**	**(1.0)**
Incremental To Baseline Revenue Requirement (NPV, $millions)	**15.0**	**53.3**	**38.3**
Incremental to Delivery Rate Impact (%)	**0.125%**	**0.442%**	**0.317%**

Notes to Table 3:

1. The change in AMI meter reading costs shown is due to the shift in the start of AMI meter deployment from 2023 as originally filed to 2024, which results in more manual meter readings occurring in 2023 and 2024 than originally assumed; the underlying costs for meter reading remained unchanged as per FEI's contract with Sensus.

2. The increase in NPV of the Operations, Contract Centre, and Meter Shop O&M is primarily due to the 14 percent allocation of meter exchange installation cost to O&M with the remaining 86 percent capitalized (included under Meter Capital as shown in the table).

4. Timing of a CPCN Decision

With the above information as background, and in line with prior consideration that the BCUC and interveners have also specifically given to the importance of a timely resolution of this proceeding,[5] FEI believes that the remainder of the regulatory process should allow for approval of the Project by year end 2022. Doing so would maximize:

- FEI's ability to acquire other products and services that would be required as part of the AMI Project in a timely manner and without further escalation in cost. The later BCUC approval is received, the more FEI is exposed to the potential of inflationary pressures on labour rates, facilities and materials that are not tied to fixed price contracts, and the more FEI and its customers are exposed to potential supply chain issues related to accessing the above.

- FEI's ability to maintain the fixed contract pricing it negotiated with Sensus, allowing FEI to acquire the meters at a significant discount from their present list price. Since the filing of the Application the parties agreed to one extension of the contractual deadline for removal of the condition precedent related to BCUC approval (the CP deadline), but FEI does not expect to be able to re-negotiate the CP deadline (presently June 30, 2023) without a significant increase in cost.

Further, as addressed in FEI's separate correspondence on June 30, 2022, FEI remains of the view that an oral hearing, which could otherwise prolong this proceeding and delay a BCUC decision, is not required.

5. Conclusion

The AMI Project remains in the public interest. This Evidentiary Update further supports the importance of the benefits of the AMI Project as well as the need for the Project, as detailed in Sections 3 and 4 of the Application.

The Project reduces FEI's exposure to the labour market and materials market challenges discussed in Section 1, as FEI would no longer be reliant on third-party manual meter reading services, and will ensure that FEI has a cost-effective meter technology in place that will be available for the foreseeable future that also delivers benefits that the Baseline and AMR Alternatives do not.

Even with the updated costs provided as part of this Evidentiary Update, in all the circumstances the Project remains FEI's preferred course of action. FEI recognizes that the Project represents a large investment in FEI's system and that the updated costs result in a

[5] For example, in its reasons for Order G-359-21 (regarding CORE's requested extension for its IR2 filing), the Panel noted that it "seeks to provide CORE sufficient time to participate meaningfully in the proceeding while not delaying the proceeding unnecessarily"; further, the Panel strove to preserve March 11 procedural conference date "thus not delaying the overall schedule for the proceeding". On p. 17 of its reasons for Order G-92-22 (setting out the regulatory timetable that flowed from the procedural conference), the BCUC noted that it "shares the BCSEA's concern about unduly lengthening the proceeding."

greater increase in customer rates than FEI originally forecast in its Application; however, the benefits of the full AMI Project solution are still significant and indeed, as reflected above, the current conditions have reinforced their importance. The Project will still have a minimal impact on customer annualized rates over the analysis period, at less than half of a percent.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Registered Parties

Appendix A

EVIDENTIARY UPDATE JULY 5, 2022
BLACKLINED PAGES

Table 1-2: 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

Project Costs and Delivery Rate Impact

The AMI Project capital cost is estimated at $752.5 million and the incremental Project capital cost (over the Baseline scenario which is the continuation of manual meter reading) is estimated at $567.6 million. During the Post-deployment phase, FEI estimates reduced capital spending of $444.7 million. FEI also estimates Post-deployment incremental O&M savings of $322.6 million. The Post-deployment phase is the time period from 2027 to 2046 over which the new AMI meters are expected to be in service, based on the estimated useful life of the new AMI meters of 20 years. The majority of the financial benefits of the Project, consisting primarily of reduced meter reading costs, will be realized over this Post-deployment phase.

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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 0.442 percent using conservative assumptions. There would be an overall rate savings for customers if the future cost of manual meter reading is higher than the Baseline low case cost scenario that has been assumed.

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1.2.4 Customer, Public, Stakeholder and Indigenous Communities Consultation

The Project represents one of the more extensive projects FEI has proposed, due to its impact to approximately 1,100,000 residential, commercial and industrial gas customers, and all communities across FEI's service territory. Consultation and engagement began in late 2019,

including publicly announcing the Project. The focus of FEI's activities has been to consult and engage with customers, other stakeholders, Indigenous groups specifically, and the broader public about the Project and solicit their feedback to support the development of this Application and the Project itself.

Key consultation and engagement activities to date include:

- Project notification letters to provincial and local governments, and Indigenous communities in FEI's service territory;
- In-person and virtual meetings with municipalities and Indigenous communities, and follow-up phone calls and emails to confirm receipt of notification letters;
- Telephone town halls and virtual information sessions with provincial and local government leaders;
- A customer perception survey and direct customer communications;
- Public information sessions, both in-person and virtual;
- Creation of a dedicated Project webpage, phone line and email address; and
- Ad campaigns, social media communications and media outreach.

FEI has consulted and sought feedback from the public and other stakeholders and has engaged with the potentially impacted Indigenous groups in the area of the Project. FEI will continue to work with all identified stakeholders and Indigenous groups to address issues and concerns throughout the lifecycle of the Project. A detailed analysis of consultation, engagement and communication activities can be found in Section 7 of the Application.

1.2.5 Conclusion

FEI believes the information contained in this Application demonstrates that the Project is in the public interest and should be approved as set out in the Application.

1.3 *SUMMARY OF APPROVALS SOUGHT*

FEI is seeking the necessary approvals to implement the Project as proposed and ensure the appropriate financial treatment of costs for regulatory purposes. The approvals sought are summarized below. The specific form of approvals sought is set out in Appendix K-1.

1.3.1 Certificate of Public Convenience and Necessity

FEI, pursuant to sections 45 and 46 of the UCA, applies to the BCUC for a CPCN for its AMI Project. A detailed description of the Project is contained in Section 5 of the Application. The Project capital cost is estimated to be $752.5 million with an estimated incremental levelized delivery rate impact of 0.442 percent.

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Table 4-2: AMR Alternative: NPV of Capital and Operating Costs ($ millions)

Financial Summary	AMR
Capital Costs:	
Meter Capital	$541.1
Project Management	$26.2
Software Capital	$2.2
Network Capital	$0.3
Non-Meter Capital	$5.3
AFUDC	$3.5
Total Capital	**$578.8**
O&M Costs:	
Meter Reading Costs	$100.9
Operations, Contact Centre and Meter Shop O&M	$58.7
New O&M	$8.8
Total O&M (incl. Capitalized Overhead)	**$168.4**
Baseline Capital[1]	$434.1
Baseline O&M[2]	$327.1
AMR Incremental Capital[3]	**$144.7**
AMR Incremental O&M Savings[4]	**($158.7)**

Notes:

[1] Appendix G-2, Page 1, Line 13

[2] Appendix G-2, Page 1, Line 21 less 16 percent for capitalized overheads[49]

[3] AMR Capital, $578.8, Less Baseline Capital $434.1

[4] AMR O&M, $168.4, Less Baseline O&M $327.1

The NPV of the revenue requirement associated with the above capital and O&M Is $1,296.1 million. When compared to the NPV of the Baseline revenue requirement of $1,303.3 million[50], the incremental NPV of the revenue requirement is a decrease of $7.2 million, with an incremental levelized delivery rate decrease of 0.059 percent.

The estimated capital and O&M costs are discussed in the sections below.

4.2.3.1 AMR Capital Costs

The estimated capital costs associated with the AMR alternative are as follows.

[49] FEI's current capitalized overhead rate is 16 percent, BCUC order G-319-20.

[50] Appendix G-4, schedule 10, line 25.

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Meter Capital

Meter capital for the AMR alternative includes estimated costs of retrofitting each existing diaphragm meter with an electronic module. Therefore, the capital cost includes both the visit to each meter as well as the cost of the module to support AMR. The AMR equipment costs are estimated based on the results of the network vendor procurement process, described in Section 5.3.3.1, and are largely made up of the cost of the communication modules that would be attached to FEI's existing residential and commercial diaphragm meters. Deployment costs are estimated based upon RFP responses (Section 5.3.3).

Under the AMR alternative, FEI's existing meter exchange, bypass valve, and regulator replacement programs would continue to be completed as part of FEI's existing sustainment capital program and have been included in capital spending to provide the full costs over the analysis period.

The NPV of meter capital costs under the AMR alternative are estimated to be approximately $541.1 million.

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Project Management

Project management for the AMR alternative includes estimated costs associated with internal and external staffing resources to manage the installation of the modules on existing meters, including costs for travel, supplies, facilities and vehicles.

The NPV of Project management costs under the AMR alternative are estimated to be $26.2 million.

Software Capital

Software capital comprises all estimated expenditures to design, install, test and commission the software environments required to operate an AMR system, as well as estimated development costs associated with integrating AMR components with existing FEI systems.

The NPV of Software costs under the AMR alternative is estimated to be $2.2 million.

Network and Non-Meter Capital

Network capital for the AMR alternative includes estimates for the infrastructure required to facilitate programming and downloading data from AMR mobile meter reading devices, including estimated costs such as the Information Systems (IS) hardware to attach the AMR vehicular-based mobile meter reading base stations to the network and transmit customer readings to FEI's billing systems.

Estimates for non-meter capital costs for the AMR alternative are related to the purchase of approximately 30 vehicular-based mobile meter reading base stations that would be used to collect meter reads throughout the service territory. This would include equipment for installation in approximately 25 full-time meter reading vehicles as well as installation in a few existing vehicles for off-cycle reads and spares in case of failure.

The NPV of Network and non-meter capital costs under the AMR alternative is estimated to be $5.7 million.

4.2.3.2 AMR Operating & Maintenance Costs

The O&M costs associated with the AMR alternative are as follows.

Meter Reading

Meter reading would include estimates for labour and vehicle costs associated with reading the AMR meters, which generally involves driving near each premises with a vehicular-based mobile meter reading base station that automatically receives the read. The implementation of this technology would allow for a reduction in meter reading costs by increasing the number of meters read by an individual in a day while eliminating the need for a reader to physically access every individual meter to collect a read. Therefore, fewer meter readers would be required overall.

Meter reading costs under the AMR alternative are estimated to be $100.9 million on an NPV basis.

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Operations, Contact Centre and Meter Shop O&M

This category of O&M costs relates to estimates for O&M expenses that would be impacted by deploying an AMR system, such as operations field work, customer contact centre costs, and compliance work in the meter shop. An AMR system would provide some benefits to FEI in these areas, including improved productivity and lower operating costs related to meter reading O&M. The prospect for bill errors resulting from manual entry errors would also be significantly reduced, thereby reducing the amount of time spent in investigating errors and correcting bills. However the current process for collecting off-cycle reads (on/off, re-reads) would only see marginal improvements as off-cycle reads would still require a resource to drive to an area close to the meter to obtain a reading (though a small amount of time would be saved from not having to exit the vehicle, access the customer's property and manually enter the read into a handheld device).

These O&M costs under the AMR alternative are estimated to be $58.7 million on an NPV basis.

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NEW O&M

New O&M includes estimated expenditures related to the labour and software licensing that would be required to support the new AMR systems. The costs associated with maintaining the AMR modules, such as replacing units that do not report and responding to tamper alarms, is also included in new O&M. Additional O&M costs under the AMR alternative are estimated to be $8.8 million on an NPV basis.

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4.2.4 Summary of AMR Alternative

The AMR alternative does not fully meet all of the drivers of the Project need. AMR would provide a partially automated meter reading solution to reduce, but not fully address, errors, while providing some improvement to customer convenience. AMR would not empower customers with timely energy usage capabilities or allow for participation in enhanced DSM programs. AMR would only reduce but not eliminate the risks and costs associated with FEI's current manual meter reading model and the Company would be locked into a technology that is trending toward obsolescence over the long-term. Finally, AMR does not allow the Company to advance key operating opportunities or offer customers enhanced billing options.

FEI's financial analysis of an AMR alternative demonstrates that an AMR alternative could be deployed at an estimated $7.2 million decrease in the NPV of the Company's revenue requirement, which amounts to a decrease in customer rates by 0.059 percent on a levelized basis over the 26-year analysis period. While this alternative is forecast to result in a small reduction in rates, it would deliver only a portion of the many potential benefits that can be provided by automating a metering system. For this reason, FEI has concluded that AMR would not provide a cost-effective, long-term solution.

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The following section provides an evaluation of the second alternative considered by FEI for addressing its Project need; an AMI alternative.

4.3 *ALTERNATIVE 2 – FULL AUTOMATION – METER READING USING ADVANCED METERING INFRASTRUCTURE*

Similar to Section 4.2, this section will assess the suitability of AMI technology as an alternative for meeting the Project need. The section first considers how effectively the range of capabilities offered by full Automation is able to address the Project drivers. A financial summary follows, which describes both the Project and operating costs associated with implementing this alternative, and estimated delivery rate impacts. The section then concludes by making the determination that in light of the many important benefits provided by the technology, the AMI alternative is a cost-effective approach that would provide the most value to customers and the Company in the long term.

4.3.1 Overview of the AMI Alternative

AMI is a metering system that records customer consumption, meter diagnostic information and other field data on an hourly or more frequent basis and transmits the data multiple times during a 24-hour period over a two-way communication network from the meter to the utility. The communication network also allows the utility to transmit commands and update firmware to customer meters or other end points as required. AMI has historically been deployed using a module that is retrofitted onto a diaphragm meter that does not provide for a remotely operated shut off valve, or more recently, as an ultrasonic (advanced) meter allowing manufacturers to incorporate a remotely operated gas shut off valve. Finally, similar to AMR, the AMI technology is expected to offer a 20-year service life limited largely by the capacity of the battery.

route; this option could be of particular importance to help some customers, such as customers on a fixed income, avoid or reduce late payment charges.

4.3.2.5 Summary of AMI Suitability to Meet the Project Need

Deployment of the AMI alternative would allow FEI to meet all the drivers for the Project need.

AMI will fully automate the meter reading function, significantly reducing the potential for errors while being far less intrusive for customers. In addition, there would be a reduction in GHG emissions by reducing the meter reading vehicles on the road. Billing accuracy will also be greatly improved and customer inquiries and service requests would be addressed in a timely manner.

AMI would provide the information to empower customers with timely access to energy use information for more effective decision-making and FEI will have the opportunity to offer customers enhanced DSM programs for a greater opportunity to support conservation and save money.

AMI would allow FEI to fully address growing uncertainty related to the Company's current meter reading model. FEI would also have certainty regarding its costs and supply of meters in the long-term. Additionally, customers and the Company would be able to benefit from any innovations that are developed in the long-term within the metering industry.

Further, AMI would provide the opportunity to advance a range of key operating benefits in areas such as system resiliency, system planning, system integrity and safety. Similarly, FEI would be able to offer enhanced billing options to customers.

The following section provides an overview of the financial analysis for the AMI alternative.

4.3.3 AMI Financial Analysis

The AMI financial analysis was performed based on a full COS Analysis, with the incremental COS being the difference between the total COS for AMI and Baseline.

The table below provides a summary of the NPV of the capital and operating costs for the AMI alternative compared to Baseline, over the 26-year analysis period.

Table 4-3: AMI Alternative: NPV of Capital and Operating Costs ($ millions)

Financial Summary	AMI
Capital Costs:	
Meter Capital	$560.1
Project Management	$35.2
Software Capital	$9.1
Network Capital	$17.1
Non-Meter Capital	$3.6
AFUDC	$16.1
Total Capital	**$641.1**

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Financial Summary	AMI
O&M Costs:	
Meter Reading Costs	$79.1
Operations, Contact Centre and Meter Shop O&M	$14.6
New O&M	$97.9
Total O&M (incl. Capitalized Overhead)	**$191.6**
Baseline Capital[1]	**$434.1**
Baseline O&M[2]	**$327.1**
AMI Incremental Capital[3]	**$207.0**
AMI Incremental O&M Savings[4]	**($135.5)**

Notes:

[1] Appendix G-2, Page 1, Line 13

[2] Appendix G-2, Page 1, Line 21 less 16 percent for capitalized overheads[53]

[3] AMI Capital, $641.1, Less Baseline Capital $434.1

[4] AMI O&M, $191.6, Less Baseline O&M $327.1

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The NPV of the revenue requirement associated with the above capital and O&M Is $1,356.6 million. When compared to the NPV of the Baseline revenue requirement of $1,303.3[54] million, the incremental NPV of the revenue requirement is an increase of $53.3 million, with an incremental levelized delivery rate increase of 0.442 percent.

The estimated capital and O&M costs are discussed in the sections below.

4.3.3.1 AMI Capital Costs

The estimated capital costs associated with the AMI alternative are as follows.

Meter Capital

Meter capital for the AMI alternative includes estimated costs of replacing each existing diaphragm meter with an advanced meter. Therefore, the capital cost includes the visit to replace each meter, the cost of the advanced meter, and a bypass valve and regulator when required.

This would include all material and installation costs for the meters, bypass valves and regulators. Since existing meters would be replaced as part of the AMI alternative, existing programs to replace regulators and install bypass valves would be accelerated and completed at the same time as meter replacement, realizing cost savings mainly as a result of efficiencies gained from the bulk purchase of bypass valves and regulators.

[53] FEI's current capitalized overhead rate is 16 percent, BCUC order G-319-20.
[54] Appendix G-4, schedule 10, line 25.

Meter capital costs under the AMI alternative are estimated to be $560.1 million on an NPV basis.

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Project Management

Project management costs include estimated labour and support costs for both internal and external resources for the system design, project management, process and change management, quality assurance, field supervision and administrative functions of the AMI Project. Project management also includes costs for travel, supplies, facilities and vehicles.

Project management costs under the AMI alternative are estimated to be $35.2 million on an NPV basis.

Software Capital

Software capital costs are comprised of estimates of all required capital expenditures to design, install, test, and commission the software environments needed as part of the AMI alternative, as well as estimated development costs associated with integrating new AMI environments with existing FEI systems.

Software capital costs under the AMI alternative are estimated to be $9.1 million on an NPV basis.

Network and Non-Meter Capital

Network and non-meter capital costs are comprised of estimates of all network licence and setup costs, including network (as defined in Section 5.4.1.1) design and installation.

These costs cover miscellaneous non-meter hardware items, including gateways, transmitters, switches, and cathodic protection devices. These costs would also include handheld/drive-by meter reading devices to outfit vehicles throughout the FEI service territory that would be required to read individual meters that are not within network coverage.

Network and non-meter capital costs under the AMI alternative are estimated to be $20.7 million on an NPV basis.

4.3.3.2 AMI O&M Costs

Additional details supporting the AMI O&M costs are discussed below including the total NPV of the estimated costs for the 26-year analysis period.

Meter Reading

Meter reading costs include estimates for remote reading of meters using the proposed AMI alternative as well as costs to manually read any devices that are not within network coverage.

Meter reading costs under the AMI alternative are estimated to be $79.1 million on an NPV basis.

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Operations, Contact Centre and Meter Shop O&M

This category of O&M activity includes estimates of costs associated with meter exchanges, operations, contact centre and meter shop work.

The gas shut-off valve in the advanced meter would enable FEI to realize cost savings related to this category of activity O&M. Remote shut off and turn on of gas flow would allow FEI to respond remotely to many issues occurring in the field, reducing the need to dispatch employees to attend customer premises.

Therefore, these O&M costs under the AMI alternative are estimated to be $14.6 million on an NPV basis.

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New O&M

These estimated costs relate to work required to maintain and manage the AMI alternative and its integration with existing FEI systems. This includes SaaS[55] fees, software licensing, support, site leases for base station sites and bandwidth costs to connect field end points to the data centres.

New O&M costs are estimated to be $97.9 million on an NPV basis.

4.3.4 Summary of AMI Alternative

An AMI alternative would fully address all drivers of the Project need. AMI would provide a fully automated meter reading solution greatly reducing errors and increasing customer convenience. AMI would empower customers with timely energy usage capabilities and allow customers to participate in enhanced DSM programs. AMI would greatly reduce the risks and costs associated with FEI's current manual meter reading model while addressing the risk of obsolescence. Finally, AMI would allow FEI to advance key operating opportunities and enable the Company to offer customers the opportunity for enhanced billing options.

FEI's financial analysis of an AMI alternative demonstrates that the AMI Project could be deployed at an estimated $53.3 million increase in the NPV of the Company's revenue requirement, which amounts to an increase in customer rates by 0.442 percent on a levelized basis over the 26-year analysis period. FEI's financial and non-financial analysis of the AMI alternative demonstrates that for a comparative delivery rate impact of less than half a percent, customers and the Company will receive significant incremental benefits.

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[55] Software as a Service is a software licensing and delivery model in which software applications are licensed on a subscription basis from a vendor.

A financial summary of FEI's alternatives analysis is presented in Table 4-5. Review of the alternative financials determined that:

- AMR has a smaller up front capital investment, lower operating costs and a small estimated rate reduction. However, it is unable to fully meet any of the drivers of the Project need to automate; and
- AMI provides a solution that meets all aspects of the Project need and does so for a comparable investment and with a delivery rate impact that is less than half a percent higher.

Table 4-5: Summary of Alternative Financials

	AMR	AMI
Capital Costs (NPV, $millions)		
Meter Capital	$541.1	$560.1
Project Management	$26.2	$35.2
Software Capital	$2.2	$9.1
Network Capital	$0.3	$17.1
Non-Meter Capital	$5.3	$3.6
AFUDC	$3.5	$16.1
Total Capital	**$578.8**	**$641.1**
O&M Costs (NPV, $millions)		
Meter Reading Costs	$100.9	$79.1
Operations, Contact Centre and Meter Shop O&M	$58.7	$14.6
New O&M	$8.8	$97.9
Total O&M (incl. Capitalized Overhead)	**$168.4**	**$191.6**
Incremental Capital (NPV, $millions)	**$144.7**	**$207.0**
Incremental O&M (NPV, $millions)	**($158.7)**	**($135.5)**
Incremental To Baseline Revenue Requirement (NPV, $millions)	**$7.2**	**$53.3**
Incremental Delivery Rate Impact (%)	**-0.059%**	**0.442%**

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For all of the reasons summarized above, and given the small difference in delivery rate impact between the two alternatives, FEI proposes the AMI alternative as being the best long-term solution for customers.

Section 5 of this Application will describe FEI's proposed AMI alternative in detail.

6. PROJECT COSTS

6.1 *INTRODUCTION*

This section discusses the costs of the Project, including contingency, and the financial analysis. Within the financial analysis section, FEI provides the assumptions, the accounting treatment, and the estimated incremental delivery rate impact of the Project.

FEI approached the financial analysis for this Project by comparing two full cost scenarios, with the difference between the scenarios being the incremental financial impact of the Project. The first scenario is FEI's Baseline meter program that represents the costs FEI expects to incur if the AMI Project is not approved. The second relates to the proposed AMI Solution. FEI took this analytical approach because of the number of changes to both operating and capital costs that will take place with approval of the Project and the requirement to understand what the operating and capital costs would have been without the Project to determine the impact. The following discussion details the expected cost of the AMI Solution compared to the expected cost of the Baseline scenario, with the difference between the two being the expected incremental cost of the Project.

As discussed in Section 5.5, the Project implementation is scheduled to take four years. In addition to these four years of implementation, FEI will continue to incur development and regulatory proceeding costs up until deployment starts in 2024. For the purpose of this section and analysis, costs have been grouped into three phases:

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1. Pre-deployment - the time period from 2021 to 2023. During this phase, costs are being incurred for Project development and for the regulatory proceeding;

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2. Deployment – the time period from 2024 to 2026. These are the years in which the majority of the AMI meters will be deployed; and

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3. Post-deployment – the time period from 2027 to 2046. This is the time period over which the new AMI meters are expected to be in service, based on the estimated useful life of the new AMI meters of 20 years. The majority of the financial benefits of the Project, consisting primarily of reduced meter reading costs, will be realized over this phase.

Only the costs in the Pre-deployment and Deployment phases are classified as the cost of the Project. The costs and savings in the Post-deployment phase are provided to evaluate the financial impact of the Project over the financial analysis period.

In the following Section 6.2, cost estimates are provided, followed by additional details supporting the estimates. In Section 6.3, the financial analysis discussion uses these cost estimates to calculate the estimated incremental delivery rate impact of the Project.

6.2 *PROJECT COSTS*

This section provides the expected capital and O&M costs of the AMI Solution, as well as the incremental costs when compared to the Baseline costs. Table 6-1 below summarizes the total estimated capital and O&M costs of the AMI Solution, the current Baseline meter program costs, and the incremental costs. Costs shown are in estimated as-spent dollars and include contingency and allowance for funds used during construction (AFUDC).

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 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	Reference [1] (6)
	AMI						
1	Capital[2]	128.3	624.1	752.5	119.2	871.6	Schedule 6,Line 44 + Schedule 9,Line 31+Line 39+Line 41+Line 43
2	O&M	57.7	52.7	110.3	234.4	344.7	Schedule 2,Line 13
	BASELINE						
3	Capital	80.5	104.4	184.9	563.9	748.8	Schedule 6,Line 28
4	O&M	53.9	59.5	113.4	554.0	667.3	Schedule 6,Line 12
	INCREMENTAL [3]						
5	Capital	47.9	519.7	567.6	(444.7)	122.9	Schedule 6,Line 39 + Schedule 9,Line 28+Line 36+Line 40
6	O&M	3.8	(6.8)	(3.0)	(319.6)	(322.6)	Schedule 2,Line 14

Notes:

[1] *Appendix G-3 contains the AMI financial schedules.*

Appendix G-4 contains the Baseline financial schedules.

Appendix G-5 contains the Incremental financial schedules.

[2] *Includes AMI Application and Development deferral additions and AFUDC.*

[3] *Incremental cost AMI Solution less Baseline.*

As shown in Table 6-1, the AMI Solution capital cost is estimated at $752.5 million[59] compared to the Baseline capital cost of $184.9 million[60] with the incremental capital cost of the Project estimated as $567.6 million[61]. Additionally, there is an estimated incremental O&M reduction over the Pre-deployment and Deployment phases of $3.0 million[62].

During the Post-deployment phase, FEI estimates reduced capital spending of $444.7 million[63]. FEI also estimates Post-deployment incremental O&M savings of $319.6 million[64].

When considering the entire life cycle of the Project, there is an estimated reduction in costs of $199.7 million[65].

[59] Table 6-1, column 3, line 1.
[60] Table 6-1, column 3, line 3.
[61] Table 6-1, column 3, line 5.
[62] Table 6-1, column 3, line 6.
[63] Table 6-1, column 4, line 5.
[64] Table 6-1, column 4, line 6.
[65] Table 6-1, column 5, line 5 + column 5, line 6.

FEI has prepared the cost estimates based on AACE Class 3 specifications in accordance with the BCUC's CPCN Guidelines. Cost estimates are based on a mix of negotiated contract prices, FEI current costs adjusted for inflation, and FEI's estimates of future expected costs.

Further details on the costs set out in Table 6-1 are provided in Section 6.2.1 for capital costs and Section 6.2.2 for O&M costs.

6.2.1 Capital Costs

This section provides information supporting the capital costs introduced in Table 6-1 above. The capital cost is made up of the following categories:

1. Meter Capital which is composed of meter hardware, meter installation, bypass valve hardware and installation, and a contact centre booking charge. This capital is discussed further in Section 6.2.1.1;
2. AMI Project Management discussed in Section 6.2.1.2;
3. AMI Network & Software discussed in Section 6.2.1.3;
4. Non-Meter Capital discussed in Section 6.2.1.4; and
5. Meter Reading Capital, which is only applicable to the Baseline scenario, and is discussed in Section 6.2.1.5.

Table 6-2 below summarizes the detailed AMI Solution, Baseline, and incremental Project capital. As the investment in the Project will result in substantial savings Post-deployment, these estimates have also been included in the table.

Table 6-2: Capital Cost Summary

Line	Project Capital Costs As-Spent in $Millions	Pre Deployment 2021 - 2023 (1)	Deployment 2024 - 2026 (2)	Subtotal (1+2) 2021 - 2026 (3)	Post Deployment 2027 - 2046 (4)	Total (3+4) 2021 - 2046 (5)	Reference [1] (6)
1	Meter Capital	81.1	564.6	645.7	111.6	757.3	Schedule 6, Lines 3 through 9
2	AMI Project Management	27.8	25.9	53.7	-	53.7	Schedule 6, Lines 13 through 17 + Schedule 9 Lines 31+39+41
3	AMI Network & Software	16.2	11.8	28.0	6.4	34.4	Schedule 6, Lines 10 through 11
4	Non-Meter Capital	1.2	2.4	3.6	1.2	4.8	Schedule 6, Line 12
5	AFUDC	1.4	19.5	20.8	-	20.8	Schedule 6, Line 36 + Schedule 9 Line 43
6	**AMI Solution**	**127.7**	**624.1**	**751.8**	**119.2**	**871.0**	Sum of Lines 1 through 5
7	Meter Capital	79.6	102.0	181.5	545.6	727.1	Schedule 6, Lines 1 through 5
8	Non-Meter Capital	0.9	2.4	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**	**80.5**	**104.4**	**184.9**	**563.9**	**748.8**	Sum of Lines 7 through 9
11	Meter Capital	1.6	462.6	464.2	(434.0)	30.2	Line 1 less Line 7
12	AMI Project Management	27.8	25.9	53.7	-	53.7	Line 2
13	AMI Network & Software	16.2	11.8	28.0	6.4	34.4	Line 3
14	Non-Meter Capital	0.3	(0.0)	0.2	(2.0)	(1.8)	Line 4 less Line 8
15	AFUDC	1.4	19.5	20.8	-	20.8	Line 5
16	Meter Reading Capital	-	-	-	(15.1)	(15.1)	Line 9
17	**Project Costs[2]**	**47.2**	**519.7**	**567.0**	**(444.7)**	**122.3**	Sum of Lines 11 through 16 [3]

Notes:

[1] *Appendix G-3 contains the AMI financial schedules*
Appendix G-4 contains the Baseline financial schedules
Appendix G-5 contains the Incremental financial schedules

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Line	Project Capital Costs As-Spent in $Millions	Pre Deployment 2021 - 2022 (1)	Deployment 2023 - 2026 (2)
1	Meter Capital	28.4	507.
2	AMI Project Management	15.6	38.
3	AMI Network & Software	3.6	24.
4	Non-Meter Capital	0.1	3.
5	AFUDC	0.9	15.
6	**AMI Solution**	**48.6**	**589.**
7	Meter Capital	46.6	112.
8	Non-Meter Capital	0.2	3.
9	Meter Reading Capital	-	-
10	**Baseline**	**46.8**	**115.**
11	Meter Capital	(18.2)	395.
12	AMI Project Management	15.6	38.
13	AMI Network & Software	3.6	24.
14	Non-Meter Capital	(0.1)	0.
15	AFUDC	0.9	15.
16	Meter Reading Capital	-	-
17	**Project Costs[2]**	**1.8**	**474.**

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[2] *Incremental cost AMI solution less Baseline*

[3] *AMI Project Management has been allocated to asset accounts in incremental financial schedules. Detail in lines 11-14 are before Project Management allocation and do not agree to amounts in the incremental financial schedules that are after allocation of project management. The reference for Line 17 that agrees to financial schedules is Schedule 6, Line 39 + Schedule 9, Lines, 28+36+38 +40.*

As shown in the table above, the AMI Solution capital cost is estimated at $751.8 million[66] and the incremental Project capital cost is estimated at $567.0 million[67]. The Project is estimated to generate incremental net savings of $444.7 million[68] in capital spending over the Post-deployment phase.

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The AMI Solution capital costs include contingency and AFUDC. Section 5.7 discussed project risk and described FEI's approach to determining contingency. FEI has included $34.3 million[69] in contingency through deployment of the Project allocated to meter capital, AMI project management, network & software, and non-meter capital. AFUDC is discussed in Section 6.3.2.1 below.

The sections that follow provide additional details supporting the costs included in each of the capital categories. Confidential Appendix G-1 and G-2 contains the detailed calculations for the capital and O&M costs used in this analysis.

6.2.1.1 Meter Capital

The meter capital cost is the largest portion of Project capital costs. The AMI Solution meter capital cost is estimated at $645.7 million[70] which is $464.2 million[71] higher than what is estimated to be spent in the Baseline estimate of $181.5 million[72]. This incremental cost is offset by an estimated $434.0 million[73] in meter capital savings in the Post-deployment period driven by the decreased volume of meter exchanges.

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Meter capital has been forecast on a unit basis for both meter exchanges and new customer additions. Table 6-3 below summarizes the estimated number of meter exchanges and new meter additions expected in both the AMI and Baseline scenarios during the Pre-deployment, Deployment, and Post-deployment phases.

[66] Table 6-2, column 3, line 6.
[67] Table 6-2, column 3, line 17.
[68] Table 6-2, column 4, line 17.
[69] Section 5.7.4 .
[70] Table 6-2, column 3, line 1.
[71] Table 6-2, column 3, line 11.
[72] Table 6-2, column 3, line 7.
[73] Table 6-6, column 4, line 11.

Table 6-3: Meter Unit Summary

Line	Meter Units 000's Item	Pre Deployment 2021 - 2023 (1)	Deployment 2024 - 2026 (2)	Subtotal (1+2) 2021 - 2026 (3)	Post Deployment 2027 - 2046 (4)	Total (3+4) 2021 - 2046 (5)
1	Meter Exchanges	135.0	1,008.6	1,143.6	106.6	1,250.2
2	New Meters	34.3	31.8	66.0	144.6	210.6
3	**Total AMI Meter Units**	**169.3**	**1,040.4**	**1,209.6**	**251.2**	**1,460.9**
4	Meter Exchanges	135.0	169.0	304.0	894.2	1,198.2
5	New Meters	34.3	31.8	66.0	144.6	210.6
6	**Total Baseline Meter Units**	**169.3**	**200.8**	**370.0**	**1,038.8**	**1,408.8**
7	Meter Exchanges	-	839.6	839.6	(787.6)	52.0
8	New Meters	-	-	-	-	-
9	**Incremental Units**	**-**	**839.6**	**839.6**	**(787.6)**	**52.0**

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Line	Meter Units 000's Item
1	Meter Exchanges
2	New Meters
3	**Total AMI Meter Units**
4	Meter Exchanges
5	New Meters
6	**Total Baseline Meter Units**
7	Meter Exchanges
8	New Meters
9	**Incremental Units**

For the AMI Project, FEI expects to complete an estimated 1.1 million[74] meter exchanges in the first two phases of the Project and an estimated 106 thousand[75] exchanges Post-deployment. The number of meter exchanges over the Baseline is an estimated incremental 840 thousand[76] through the Deployment phase, offset by a reduction of 788 thousand[77] meter exchanges in the Post-deployment phase.

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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.

In Table 6-3, FEI has also shown the estimated new customer addition meters, and used the same volume assumption for both AMI and Baseline resulting in no incremental volume change for new meter additions.

Meter capital consists of meter hardware, meter installation, bypass valve hardware and installation, and the capitalized cost of contact centre meter exchange bookings. Each of these items is discussed separately below.

Meter Hardware

Meter hardware consists of meters, regulators, and large commercial and industrial meter AMI modules. 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. FEI's current meters, the new AMI meters, and large meter modules are sourced in US dollars

[74] Table 6-3, column 3, line 1.
[75] Table 6-3, column 4, line 1.
[76] Table 6-3, column 3, line 9.
[77] Table 6-3, column 4, line 9.

and have been included in the cost estimate in CAD dollars.[78] Specific to the AMI Solution, the AMI meters and larger meter modules have been negotiated to have fixed term pricing through Deployment. 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.

Meter Installation

Meter installation consists of the costs to install meters, regulators, and large meter modules. As discussed in Section 5.3.3.2, 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 current local contractor pricing as well as related costs. Schedules 2.1, 2.2, and 2.3 in confidential Appendix G-1 contain the detailed assumptions for meter installation. Schedule 2.2 contains the detail supporting the incremental cost of installing the AMI meters.

Bypass Valve Hardware and Installation

As described in Section 5.3.3.3, bypass valve installation is part of the standard meter exchange activity. The AMI Project accelerates the meter exchange process and, as a result, also accelerates the timing of the planned installation of bypass valves to the Deployment phase of this Project. Currently, bypass valves are deployed on an estimated 20 percent of FEI's meter fleet. The AMI Project will see full deployment of bypass valves on existing meters sooner than would be achieved in FEI's Baseline meter program. The incremental cost of deploying the bypass valves sooner than would be achieved under the Baseline scenario results in incremental savings in the Post-deployment capital spending. The savings are predominantly driven from avoided inflation on the cost of the bypass valves, fixed pricing through Deployment, and efficiencies in installation achieved through the mass AMI meter deployment.

Contact Centre Bookings Charge

A small unit cost for each meter exchange booked through FEI's customer contact centre is capitalized and added to meter installation. This unit cost has been included in the financial model using current costs escalated by inflation annually.[79] During the Deployment phase, the increased volume of meter exchanges will drive an increase in this charge; whereas during the Post-deployment phase, there will be an offsetting decrease in this charge associated with a decreased volume of meter exchanges.

Deleted: The AMI Solution will result in current meter exchange activity being halted in 2022 leading up to AMI Deployment, and as a result FEI expects a small decrease in the contact centre booking charge in 2022 specific only to the AMI Solution.

6.2.1.2 AMI Project Management

AMI Project management only applies to the AMI Solution and is therefore only an incremental cost in the financial analysis. AMI Project management costs include resources (project team incremental labour), consulting and legal costs, and miscellaneous costs such as travel,

[78] Based on foreign exchange discussed in Section 6.3.1.4.
[79] Section 6.3.1.2 discusses inflation rate.

6.2.2 O&M Costs

With the implementation of the AMI Project, there will be a net O&M savings in all phases, with significant savings in the Post-deployment phase primarily from reduced costs of manual meter reading. This section discusses the incremental O&M expenses FEI expects to incur, and the offsetting savings identified in the following O&M categories:

1. New AMI O&M including incremental labour, AMI software, and AMI network discussed in Section 6.2.2.1;
2. Meter installation O&M discussed in Section 6.2.2.2;
3. Meter reading O&M discussed in Section 6.2.2.3;
4. Operations O&M discussed in Section 6.2.2.4;
5. Customer service O&M discussed in Section 6.2.2.5; and
6. Meter shop O&M discussed in Section 6.2.2.6.

Table 6-5 below summarizes the net O&M savings expected as a result of this Project. FEI notes these amounts are after reducing the gross amounts for capitalized overheads.[90]

Table 6-5: Incremental O&M Savings Summary

Line	Incremental O&M[1] As-Spent in $Millions Item	Pre Deployment 2021 - 2023 (1)	Deployment 2024 - 2026 (2)	Subtotal (1+2) 2021 - 2026 (3)	Post Deployment 2027 - 2046 (4)	Total (3+4) 2021 - 2046 (5)	Reference[2] (6)
1	New AMI O&M	4.3	18.0	22.2	152.5	174.7	
2	Meter Installation O&M	-	(2.3)	(2.3)	(22.6)	(25.0)	
3	Meter Reading O&M	-	(21.1)	(21.1)	(404.4)	(425.5)	
4	Operations O&M	(0.1)	(0.6)	(0.6)	(25.8)	(26.4)	
5	Customer Service O&M	0.1	-	0.1	(12.7)	(12.6)	
6	Meter Shop O&M	(0.5)	(0.8)	(1.3)	(6.5)	(7.8)	
7	**Incremental O&M costs / (savings)**	**3.8**	**(6.8)**	**(3.0)**	**(319.6)**	**(322.6)**	Schedule 2, Line 14 & Agrees to Table 6-1 Line 6

Notes:

[1] *O&M costs net of capitalized overheads.*

[2] *Appendix G-5 contains the incremental financial schedules.*

As shown above, FEI estimates incremental savings in total O&M through the Pre-deployment and Deployment phases of $3.0 million[91] and a further $319.6 million[92] in savings through the Post-deployment phase.

The sections below will discuss each O&M item in more detail.

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Line	Incremental O&M[1] As-Spent in $Millions Item	Pre Deployment 2021 - 2022 (1)	De 20
1	New AMI O&M	0.8	
2	Meter Installation O&M	(0.9)	
3	Meter Reading O&M	(0.0)	
4	Operations O&M	(0.0)	
5	Customer Service O&M	0.0	
6	Meter Shop O&M	(0.2)	
7	**Incremental O&M costs / (savings)**	**(0.4)**	

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[90] FEI's current capitalized overhead rate is 16 percent, BCUC order G-319-20.
[91] Table 6-5, column 3, line 7.
[92] Table 6-5, column 4, line 7.

6.2.2.1 New AMI O&M

The new O&M that will be incurred as a result of the implementation of AMI includes incremental internal labour, AMI network O&M, and AMI software O&M.

- **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[93] 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[94] 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.[95]
- **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[96] 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.[97]

6.2.2.2 Meter Installation O&M

Currently, FEI allocates 14 percent of the meter exchange installation cost to O&M and this has been included in both the AMI Solution and Baseline scenario. However, for the AMI Solution, the incremental meter exchange activities in the Deployment phase are not allocated to O&M, as these activities are incremental to normal operation. All of the exchanges in the Post-deployment phase are allocated 14 percent to O&M.

FEI estimates $2.3 million[98] in savings related to meter installation O&M through the Deployment phase and an additional $22.6 million[99] in savings Post-deployment. The Deployment phase savings result from the full cost of the incremental meter exchanges being allocated to capital. The Post-deployment savings result from reduced meter exchanges in this phase.

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[93] Section 6.3.1.2.
[94] Section 6.3.1.2.
[95] Section 6.3.1.4.
[96] Section 6.3.1.2.
[97] Section 6.3.1.4.
[98] Table 6-5, column 3, line 2.
[99] Table 6-5, column 4, line 2.

6.2.2.3 Meter Reading O&M

Meter reading is the largest component of O&M costs impacted by the AMI Project and the area with the largest savings. Meter reading O&M presented here consists of the manual costs of reading meters and the cellular costs for current large commercial and industrial meters.

Table 6-6 below summarizes the estimated incremental meter reading costs / (savings), and the discussion that follows provides additional details for each of the phases of the Project.

Table 6-6: Meter Reading O&M Summary

Line	Meter Reading O&M[1] As-Spent in $Millions Item	Pre Deployment 2021 - 2023 (1)	Deployment 2024 - 2026 (2)	Subtotal (1+2) 2021 - 2026 (3)	Post Deployment 2027 - 2046 (4)	Total (3+4) 2021 - 2046 (5)
1	Meter Reading	38.7	21.8	60.5	29.1	89.6
2	Large Commercial / Industrial Cellular	1.5	0.9	2.4	1.1	3.5
3	**AMI Meter Reading O&M**	**40.2**	**22.7**	**62.9**	**30.3**	**93.1**
4	Meter Reading	38.7	42.2	80.9	432.5	513.4
5	Large Commercial / Industrial Cellular	1.5	1.6	3.1	2.1	5.2
6	**Baseline Meter Reading O&M**	**40.2**	**43.8**	**84.0**	**434.6**	**518.6**
7	Meter Reading	-	(20.4)	(20.4)	(403.4)	(423.8)
8	Large Commercial / Industrial Cellular	-	(0.7)	(0.7)	(1.0)	(1.7)
9	**Incremental Meter Reading O&M**	**-**	**(21.1)**	**(21.1)**	**(404.4)**	**(425.5)**

Notes:

[1] *O&M costs net of capitalized overheads.*

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Line	Meter Reading O&M[1] As-Spent in $Millions Item	De 2
1	Meter Reading	
2	Large Commercial / Industrial Cellular	
3	**AMI Meter Reading O&M**	
4	Meter Reading	
5	Large Commercial / Industrial Cellular	
6	**Baseline Meter Reading O&M**	
7	Meter Reading	
8	Large Commercial / Industrial Cellular	
9	**Incremental Meter Reading O&M**	

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Pre-deployment Phase

FEI expects an immaterial amount of savings in the Pre-deployment phase, limited to the large commercial and industrial meter modules starting to be deployed in 2022, which results in a reduction in current cellular reading costs for those meters that move to the new AMI network.

Deployment Phase

In the Deployment phase, FEI expects $21.1 million[100] in meter reading O&M savings. These savings result from the reduction in volume of non-AMI meters that require manual reads as they are exchanged with an AMI meter that will be read remotely via the proposed network. The savings estimate is based on FEI's current outsourced meter reading cost including inflation[101] less the cost of any AMI meters that may need to be manually read. 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. For the purpose of this analysis, FEI has also assumed FEI's operations field crews will

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[100] Table 6-6, column 2, line 9.
[101] Section 6.3.1.2.

6.2.2.4 Operations O&M

Operations O&M refers to O&M activities completed by FEI's field crews.

FEI's Operations team conducted a review of current activities and identified several activities that would be reduced with the functionality introduced within the AMI Project. Reduced activities include meter trouble calls, meter reads, meter identifications, disconnects, unlocks, cathodic protection data gathering, and odour measurement.

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]

Table 6-7 below summarizes the reduction in existing Operations O&M and the incremental Operations O&M included in the financial analysis.

Table 6-7: Operations O&M Summary

Line	Operations O&M[1] As-Spent in $Millions Item	Pre Deployment 2021 - 2023 (1)	Deployment 2024 - 2026 (2)	Subtotal (1+2) 2021 - 2026 (3)	Post Deployment 2027 - 2046 (4)	Total (3+4) 2021 - 2046 (5)	Reference (6)
1	Existing Operations Activities	(0.1)	(0.6)	(0.6)	(54.0)	(54.6)	
2	New Operations Activities	-	-	-	28.2	28.2	
3	**Incremental Operations O&M costs / (savings)**	**(0.1)**	**(0.6)**	**(0.6)**	**(25.8)**	**(26.4)**	Agrees to Table 6-6 Line 4

Notes:

[1] *O&M costs net of capitalized overheads.*

As shown in the above table, through the Deployment phase, FEI expects minimal savings, estimated at $0.6 million, mainly enabled by the SentryPoints[108] installed on the gas network that will reduce cathodic protection activities.

The majority of the Operations O&M savings in the Post-deployment phase, estimated in total at $25.8 million, come from a reduction in Operations activities.

6.2.2.5 Customer Service O&M

The AMI Project will enable savings in FEI's customer service function. Customer service identified savings will come from the following reduced activities: billing investigation and exceptions, meter reading coordinator workload, improvements in vacant premises processing, and meter switching identification and validation.

FEI estimates incremental costs in customer service O&M through the Deployment phase of $0.1 million[109] related to AMI process training. Post-deployment savings are estimated at $12.7 million[110].

[107] 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.
[108] Section 5.4.1.1.
[109] Table 6-5, column 3, line 5.
[110] Table 6-5, column 4, line 5.

notes the proposed new rates for AMI software and AMI Communication and Equipment[120] have been assumed to be equivalent to the rates FBC uses for similar assets. 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.

6.3.2 Accounting Treatment

6.3.2.1 Treatment of Capital Costs

Consistent with FEI's approved CPCN treatment, the capital costs of the Project will be held outside of rate base in capital work in process, attracting AFUDC, until they are placed into service. As construction is completed on the various assets included in the Project, the assets will be commissioned and placed into service. The assets will enter rate base on January 1 of the year following their in-service date by adding the capital cost of the assets into the appropriate plant asset accounts. Depreciation of the assets included in FEI's rate base will begin the year that they enter rate base. The AMI meters exchanged during the Deployment phase of the Project will enter rate base January 1 in the year following the date of the meter installation.

6.3.2.2 AMI Application and Feasibility Cost Deferral

In this Application, FEI seeks approval for the creation of the AMI Application and Feasibility Cost deferral account. The purpose of this account is to capture costs associated with developing the AMI Project and the regulatory proceeding to review the Application. Similar to the capital costs discussed above, the account will be non-rate base and earn an after tax WACC carrying cost until it enters rate base. FEI expects to incur costs of approximately $10.3 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 on January 1 following BCUC Decision and proposes to amortize the costs accrued to this account over three years.

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6.3.2.3 AMI Foreign Exchange (FX) Mark to Market Valuation

FEI is also seeking BCUC approval under sections 59-61 of the UCA for a deferral account, entitled the "AMI FX Mark to Market" deferral account, to capture the mark-to-market valuation of any foreign currency risk mitigation contracts (FX Contracts) entered into related to the Project. The deferral account is an important tool to mitigate external income statement volatility that would arise with the use of FX Contracts. This treatment is similar to what the BCUC approved for the

[120] The proposed asset class that will hold the AMI network and non-meter capital.

Mt. Hayes LNG Facility CPCN[121] and the Customer Care Enhancement CPCN[122] and is similar to what FEI has proposed in the TLSE Project Application.[123]

A significant portion of the costs of the Project includes US Dollar (USD) payments giving rise to exchange rate risk. Table 6-9 below summarizes the estimated value of USD exposure through deployment of the Project.

Table 6-9: US Dollar Exposure

US Dollar Exposure ($millions)	2021	2022	2023	2024	2025	2026	Total
Total US Dollar Exposure included in costs	6.6	8.3	22.0	85.7	80.6	80.6	283.8

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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. The extent of currency risk mitigation will be based on FEI's risk assessment of the overall exposure as well as the cost and effectiveness of the FX Contracts.

While using FX Contracts will help mitigate the risk of exchange rate differences, these types of contracts are considered derivative instruments under FASB Accounting Standards Codification 815, Derivatives and Hedging, which would require FEI to record a fair value (mark-to-market) entry at the end of each accounting period. In the absence of an approved deferral account, those mark-to-market adjustments would be included in FEI's earnings for the period.

Due to the potential volatility in FEI's external financial statements arising from the required recognition of mark-to-market valuation of FX Contracts, FEI requests approval of a deferral account to capture these mark-to-market adjustments over the course of the Project. 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.

The requested deferral account is beneficial to FEI and its customers. It allows FEI to mitigate the impact on its external financial statements arising from undertaking the hedging of the USD denominated payments during the Project execution. By doing so, it facilitates the use of FX

[121] Order G-145-08.
[122] Order G-96-10.
[123] Filed with the BCUC on December 29, 2020. A revised redacted version was filed on March 25, 2021.

Contracts that will provide increased certainty to customers on the exchange rate used for the USD portion project costs.

FEI will report on the use of this deferral account as part of the Project progress reports filed with the BCUC.

6.3.2.4 Accounting Treatment for Retirement of Existing Meters

As part of the AMI Project, existing meters will be replaced with new AMI meters. Therefore, the financial analysis includes the recovery of the remaining rate base value associated with the existing in-service series 200 and 400 meters, and also the rate base value of meters embedded in accumulated depreciation that have been previously retired (due to the group accounting method employed by FEI). Each of these items is discussed separately below.

Recovery of Existing Meters

FEI has considered two options for the recovery period of the remaining rate base value of existing meters to be removed from service as part of the proposed AMI Project. In both cases, the existing meters would be removed from service as they are replaced over the 2024-2026 period, with the remaining net book value for the retired meters transferred to a new rate base deferral account named "Existing Meter Cost Recovery". 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.

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FEI is proposing an amortization period of 5 years, and has assumed this treatment in the financial analysis for the Project. 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 $87 million[124].

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Recovery of Previously Retired Meters

In addition to the recovery of the remaining rate base value for meters to be retired due to the AMI Project, there is approximately $74 million[125] 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.[126] With the existing meters

[124] Table 6-10, Line 9.
[125] Table 6-10, Line 10.
[126] The approved regulatory treatment at the time of retirement is to credit plant in service and debit accumulated depreciation such that the remaining net book value remains in accumulated depreciation and is taken into account in future depreciation studies to recover the costs over a future period. The amounts represent unrecovered depreciation.

being retired due to the AMI Project and to continue recovery of the aforementioned remaining rate base value as approved, FEI proposes to transfer this balance to a new rate base deferral account named the "Previously Retired Meter Cost Recovery" deferral account, with an amortization period of 10 years, which 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.

Table 6-10 below provides a continuity view of the existing in service meter hardware and installation asset values including the proposed transfers to recovery deferrals.

Table 6-10: Existing Meter Asset Continuity ($ millions)

Line	Non-AMI Meter Losses	2021	2022	2023	2024	2025	2026	Total	Reference[1]
1	Beg Hardware and Installation[2]	429.0	427.8	426.9	408.7	272.5	136.2		Schedule 7, Line 4 + Line 5
2	Additions	17.5	17.6	-	-	-	-		Schedule 7, Line 23 + Line 24
3	Retirements	(18.7)	(18.5)	(18.2)	(136.2)	(136.2)	(136.2)		Schedule 7, Line 41 + Line 42
4	End Hardware and Installation	427.8	426.9	408.7	272.5	136.2	-		Schedule 7, Line 59 + Line 60
5									
6	Accumulated Depreciation, Beginning[3]	(177.4)	(184.3)	(191.3)	(207.5)	(154.6)	(85.2)		Schedule 8, Line 4 + Line 5
7	Depreciation	(25.6)	(25.5)	(25.5)	(24.4)	(16.3)	(8.1)		Schedule 8, Line 23 + Line 24
8	Retirement	18.7	18.5	18.2	136.2	136.2	136.2		Line 3
9	**Existing Meter Write Off[4]**	-	-	**(5.8)**	**(35.3)**	**(26.9)**	**(19.3)**	**(87.3)**	Schedule 9, Line 13
10	**Previously Retired Meter Write Off[5]**	-	-	**(3.2)**	**(23.6)**	**(23.6)**	**(23.6)**	**(74.0)**	Schedule 9, Line 4
11	Accumulated Depreciation, Ending	(184.3)	(191.3)	(207.5)	(154.6)	(85.2)	-		Schedule 8, Line 61 + Line 62
12									
13	NBV, Beginning[6]	251.6	243.5	235.6	201.2	117.8	51.1		Line 1 + Line 6
14	NBV, Ending	243.5	235.6	201.2	117.8	51.1	-		Line 4 + Line 11

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Line	Non-AMI Meter Losses	2021
1	Beg Hardware and Installation[2]	429.0
2	Additions	13.9
3	Retirements	(18.7)
4	End Hardware and Installation	424.1
5		
6	Accumulated Depreciation, Beginning[3]	(177.4)
7	Depreciation	(25.6)
8	Retirement	18.7
9	**Existing Meter Write Off[4]**	-
10	**Previously Retired Meter Write Off[5]**	-
11	Accumulated Depreciation, Ending	(184.3)
12		
13	NBV, Beginning[6]	251.6
14	NBV, Ending	239.9

Notes:

[1] *Appendix G-3, AMI Financial Schedules.*

[2] *Beginning plant values of 163.3 + 265.7 as reported in Section 6.3.1.5.*

[3] *Beginning plant values of 90.3 + 87.1 as reported in Section 6.3.1.5.*

[4] *Line 9 sums to $87.3.*

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[5] *Line 10 sums to $74.0.*

[6] *Beginning plant values of 72.99 + 178.6 as reported in Section 6.3.1.5.*

6.3.3 Estimated Delivery Rate Impact

Using the cost information, assumptions, and regulatory accounting treatment discussed in this section, 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. Table 6-11 below summarizes the NPV of the annual revenue requirements over the term of the analysis (26 years) for each of the scenarios and includes the levelized delivery rate impact for each. The variance between the two represents the incremental impact from the AMI Project.

Table 6-11: Levelized Delivery Rate Impact

Levelized Rates	AMI	Baseline	Incremental
NPV Annual Revenue Requirement millions	1,357	1,303	53
Levelized % Increase 2021 Rates	11.256%	10.814%	**0.442%**

The estimated incremental delivery rate impact expected over the 26-year analysis period for the AMI Project is 0.442 percent when compared to 2021 rates. In 2027, the year after full AMI deployment, the cumulative delivery rate impact would be at its highest level of 6.27 percent, resulting in a cumulative annual average bill increase of $28.5 dollars for a residential customer consuming 90 GJs per year. Each year thereafter, the cumulative delivery rate impact would decrease resulting in an overall average of 0.442 percent per year over the 26-year analysis period. The year 2034, two years after the proposed "Existing Meters Cost Recovery" deferral account has been fully amortized, will be the first year the incremental delivery rate impact will be a decrease.

6.3.3.1 Delivery Rate Impact Sensitivity to Future Meter Reading Savings

FEI notes the incremental delivery rate impact is sensitive to the underlying inputs. Specifically, the rate impact analysis is sensitive to the underlying input used for future meter reading savings. For the reasons set out in Section 3.3.3, and further described in Section 6.2.2.3, FEI has included in the Baseline scenario the cost of bringing manual meter reading in-house starting in 2027. The cost assumptions used in the Baseline scenario are based on FEI's low case cost estimate. FEI has provided Table 6-12 below summarizing the delivery rate impact associated with the variability in the assumption regarding future meter reading savings.

Table 6-12: In-House Meter Reading Scenario Delivery Rate Impact Sensitivity

Line	Meter Reading Costs Scenario	Baseline Impact	AMI Impact	Incremental Impact
1	Continuation of current embedded costs	0.000%	0.617%	0.617%
2	Future in-house meter reading low case	0.174%	0.617%	0.442%
3	Future in-house meter reading high case	0.769%	0.617%	-0.153%

The analysis discussed in this section is based on line 2 and results in the incremental impact of 0.442 percent. If FEI were to use the high case cost estimate for future in-house meter reading, the incremental delivery rate impact would decrease by 0.60 percent to a levelized delivery rate decrease of 0.153 percent. FEI has also provided the delivery rate impact associated with the unlikely scenario of maintaining the current cost of outsourced manual meter reading embedded in FEI's current O&M costs on line 1.

6.3.3.2 Fort Nelson Impact

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. Direct charges include meter capital, meter installation, any associated meter write off, and network hardware. Common capital items, such as software and Project management costs will be allocated to Fort Nelson based on the number of meters deployed. O&M items such as the reduced meter reading costs and annual network servicing costs will be allocated to Fort Nelson based on the number of customers. These allocation approaches are consistent with current allocation methods for Fort Nelson. Fort Nelson's cost of the project is estimated at $1.8 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 1.08 percent.

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6.4 *SUMMARY*

In summary, the AMI Project is expected to incur $752.5 million in capital expenditures through the Deployment phase, which is equal to $567.6 million incremental to what would otherwise be spent under the Baseline scenario (during normal operations of the existing meter program). The $567.6 million of incremental capital is projected to be offset by future savings in capital and O&M expenditures in the Post-deployment phase.

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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 0.442 percent using conservative assumptions. There would be an overall delivery rate savings for customers if the future cost of manual meter reading is higher than the Baseline low case cost scenario that has been assumed.

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Specific approvals sought in light of the discussion in this section include:

- The creation of four new asset accounts with associated depreciation and net salvage rates:
    1. 478-10 / AMI Meter Hardware – depreciation rate set to 5 percent, no net salvage;
    2. 474-00 / AMI Meter Installation – depreciation rate set to 5 percent, 1.58 percent net salvage;
    3. 402-06 / AMI Software – depreciation rate set to 10 percent;[127]
    4. 488-30 / AMI Communications and Equipment – depreciation rate set to 6.67 percent, no net salvage;
- Creation of a non rate base **AMI Application and Feasibility** cost deferral account attracting a 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 3 years;

[127] There is no net salvage for software as there are no associated removal costs.

Appendix B

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CLEAN PAGES

Table 1-2: 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

Project Costs and Delivery Rate Impact

The AMI Project capital cost is estimated at $752.5 million and the incremental Project capital cost (over the Baseline scenario which is the continuation of manual meter reading) is estimated at $567.6 million. During the Post-deployment phase, FEI estimates reduced capital spending of $444.7 million. FEI also estimates Post-deployment incremental O&M savings of $322.6 million. The Post-deployment phase is the time period from 2027 to 2046 over which the new AMI meters are expected to be in service, based on the estimated useful life of the new AMI meters of 20 years. The majority of the financial benefits of the Project, consisting primarily of reduced meter reading costs, will be realized over this Post-deployment phase.

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 0.442 percent using conservative assumptions. There would be an overall rate savings for customers if the future cost of manual meter reading is higher than the Baseline low case cost scenario that has been assumed.

1.2.4

Customer, Public, Stakeholder and Indigenous Communities Consultation

The Project represents one of the more extensive projects FEI has proposed, due to its impact to approximately 1,100,000 residential, commercial and industrial gas customers, and all communities across FEI's service territory. Consultation and engagement began in late 2019,

including publicly announcing the Project. The focus of FEI's activities has been to consult and engage with customers, other stakeholders, Indigenous groups specifically, and the broader public about the Project and solicit their feedback to support the development of this Application and the Project itself.

Key consultation and engagement activities to date include:

- Project notification letters to provincial and local governments, and Indigenous communities in FEI's service territory;
- In-person and virtual meetings with municipalities and Indigenous communities, and follow-up phone calls and emails to confirm receipt of notification letters;
- Telephone town halls and virtual information sessions with provincial and local government leaders;
- A customer perception survey and direct customer communications;
- Public information sessions, both in-person and virtual;
- Creation of a dedicated Project webpage, phone line and email address; and
- Ad campaigns, social media communications and media outreach.

FEI has consulted and sought feedback from the public and other stakeholders and has engaged with the potentially impacted Indigenous groups in the area of the Project. FEI will continue to work with all identified stakeholders and Indigenous groups to address issues and concerns throughout the lifecycle of the Project. A detailed analysis of consultation, engagement and communication activities can be found in Section 7 of the Application.

1.2.5

Conclusion

FEI believes the information contained in this Application demonstrates that the Project is in the public interest and should be approved as set out in the Application.

1.3 *SUMMARY OF APPROVALS SOUGHT*

1.3.1 FEI is seeking the necessary approvals to implement the Project as proposed and ensure the appropriate financial treatment of costs for regulatory purposes. The approvals sought are summarized below. The specific form of approvals sought is set out in Appendix K-1.

Certificate of Public Convenience and Necessity

FEI, pursuant to sections 45 and 46 of the UCA, applies to the BCUC for a CPCN for its AMI Project. A detailed description of the Project is contained in Section 5 of the Application. The Project capital cost is estimated to be $752.5 million with an estimated incremental levelized delivery rate impact of 0.442 percent.

Table 4-2: AMR Alternative: NPV of Capital and Operating Costs ($ millions)

Financial Summary	AMR
Capital Costs:	
Meter Capital	$541.1
Project Management	$26.2
Software Capital	$2.2
Network Capital	$0.3
Non-Meter Capital	$5.3
AFUDC	$3.5
Total Capital	**$578.8**
O&M Costs:	
Meter Reading Costs	$100.9
Operations, Contact Centre and Meter Shop O&M	$58.7
New O&M	$8.8
Total O&M (incl. Capitalized Overhead)	**$168.4**
Baseline Capital[1]	$434.1
Baseline O&M[2]	$327.1
AMR Incremental Capital[3]	**$144.7**
AMR Incremental O&M Savings[4]	**($158.7)**

Notes:

[1] Appendix G-2, Page 1, Line 13

[2] Appendix G-2, Page 1, Line 21 less 16 percent for capitalized overheads[49]

[3] AMR Capital, $578.8, Less Baseline Capital $434.1

[4] AMR O&M, $168.4, Less Baseline O&M $327.1

The NPV of the revenue requirement associated with the above capital and O&M Is $1,296.1 million. When compared to the NPV of the Baseline revenue requirement of $1,303.3 million[50], the incremental NPV of the revenue requirement is a decrease of $7.2 million, with an incremental levelized delivery rate decrease of 0.059 percent.

4.2.3.1

The estimated capital and O&M costs are discussed in the sections below.

AMR Capital Costs

The estimated capital costs associated with the AMR alternative are as follows.

[49] FEI's current capitalized overhead rate is 16 percent, BCUC order G-319-20.
[50] Appendix G-4, schedule 10, line 25.

Meter Capital

Meter capital for the AMR alternative includes estimated costs of retrofitting each existing diaphragm meter with an electronic module. Therefore, the capital cost includes both the visit to each meter as well as the cost of the module to support AMR. The AMR equipment costs are estimated based on the results of the network vendor procurement process, described in Section 5.3.3.1, and are largely made up of the cost of the communication modules that would be attached to FEI's existing residential and commercial diaphragm meters. Deployment costs are estimated based upon RFP responses (Section 5.3.3).

Under the AMR alternative, FEI's existing meter exchange, bypass valve, and regulator replacement programs would continue to be completed as part of FEI's existing sustainment capital program and have been included in capital spending to provide the full costs over the analysis period.

The NPV of meter capital costs under the AMR alternative are estimated to be approximately $541.1 million.

Project Management

Project management for the AMR alternative includes estimated costs associated with internal and external staffing resources to manage the installation of the modules on existing meters, including costs for travel, supplies, facilities and vehicles.

The NPV of Project management costs under the AMR alternative are estimated to be $26.2 million.

Software Capital

Software capital comprises all estimated expenditures to design, install, test and commission the software environments required to operate an AMR system, as well as estimated development costs associated with integrating AMR components with existing FEI systems.

The NPV of Software costs under the AMR alternative is estimated to be $2.2 million.

Network and Non-Meter Capital

Network capital for the AMR alternative includes estimates for the infrastructure required to facilitate programming and downloading data from AMR mobile meter reading devices, including estimated costs such as the Information Systems (IS) hardware to attach the AMR vehicular-based mobile meter reading base stations to the network and transmit customer readings to FEI's billing systems.

Estimates for non-meter capital costs for the AMR alternative are related to the purchase of approximately 30 vehicular-based mobile meter reading base stations that would be used to collect meter reads throughout the service territory. This would include equipment for installation in approximately 25 full-time meter reading vehicles as well as installation in a few existing vehicles for off-cycle reads and spares in case of failure.

The NPV of Network and non-meter capital costs under the AMR alternative is estimated to be $5.7 million.

AMR Operating & Maintenance Costs

The O&M costs associated with the AMR alternative are as follows.

Meter Reading

4.2.3.2

Meter reading would include estimates for labour and vehicle costs associated with reading the AMR meters, which generally involves driving near each premises with a vehicular-based mobile meter reading base station that automatically receives the read. The implementation of this technology would allow for a reduction in meter reading costs by increasing the number of meters read by an individual in a day while eliminating the need for a reader to physically access every individual meter to collect a read. Therefore, fewer meter readers would be required overall.

Meter reading costs under the AMR alternative are estimated to be $100.9 million on an NPV basis.

Operations, Contact Centre and Meter Shop O&M

This category of O&M costs relates to estimates for O&M expenses that would be impacted by deploying an AMR system, such as operations field work, customer contact centre costs, and compliance work in the meter shop. An AMR system would provide some benefits to FEI in these areas, including improved productivity and lower operating costs related to meter reading O&M. The prospect for bill errors resulting from manual entry errors would also be significantly reduced, thereby reducing the amount of time spent in investigating errors and correcting bills. However the current process for collecting off-cycle reads (on/off, re-reads) would only see marginal improvements as off-cycle reads would still require a resource to drive to an area close to the meter to obtain a reading (though a small amount of time would be saved from not having to exit the vehicle, access the customer's property and manually enter the read into a handheld device).

These O&M costs under the AMR alternative are estimated to be $58.7 million on an NPV basis.

NEW O&M

New O&M includes estimated expenditures related to the labour and software licensing that would be required to support the new AMR systems. The costs associated with maintaining the AMR modules, such as replacing units that do not report and responding to tamper alarms, is also included in new O&M. Additional O&M costs under the AMR alternative are estimated to be $8.8 million on an NPV basis.

Summary of AMR Alternative

The AMR alternative does not fully meet all of the drivers of the Project need. AMR would provide a partially automated meter reading solution to reduce, but not fully address, errors, while providing some improvement to customer convenience. AMR would not empower customers with timely energy usage capabilities or allow for participation in enhanced DSM programs. AMR would only reduce but not eliminate the risks and costs associated with FEI's current manual meter reading model and the Company would be locked into a technology that is trending toward obsolescence over the long-term. Finally, AMR does not allow the Company to advance key operating opportunities or offer customers enhanced billing options.

4.2.4

FEI's financial analysis of an AMR alternative demonstrates that an AMR alternative could be deployed at an estimated $7.2 million decrease in the NPV of the Company's revenue requirement, which amounts to a decrease in customer rates by 0.059 percent on a levelized basis over the 26-year analysis period. While this alternative is forecast to result in a small reduction in rates, it would deliver only a portion of the many potential benefits that can be provided by automating a metering system. For this reason, FEI has concluded that AMR would not provide a cost-effective, long-term solution.

The following section provides an evaluation of the second alternative considered by FEI for addressing its Project need; an AMI alternative.

4.3 *ALTERNATIVE 2 – FULL AUTOMATION – METER READING USING ADVANCED METERING INFRASTRUCTURE*

Similar to Section 4.2, this section will assess the suitability of AMI technology as an alternative for meeting the Project need. The section first considers how effectively the range of capabilities offered by full Automation is able to address the Project drivers. A financial summary follows, which describes both the Project and operating costs associated with implementing this alternative, and estimated delivery rate impacts. The section then concludes by making the determination that in light of the many important benefits provided by the technology, the AMI alternative is a cost-effective approach that would provide the most value to customers and the Company in the long term.

4.3.1

Overview of the AMI Alternative

AMI is a metering system that records customer consumption, meter diagnostic information and other field data on an hourly or more frequent basis and transmits the data multiple times during a 24-hour period over a two-way communication network from the meter to the utility. The communication network also allows the utility to transmit commands and update firmware to customer meters or other end points as required. AMI has historically been deployed using a module that is retrofitted onto a diaphragm meter that does not provide for a remotely operated shut off valve, or more recently, as an ultrasonic (advanced) meter allowing manufacturers to incorporate a remotely operated gas shut off valve. Finally, similar to AMR, the AMI technology is expected to offer a 20-year service life limited largely by the capacity of the battery.

route; this option could be of particular importance to help some customers, such as customers on a fixed income, avoid or reduce late payment charges.

Summary of AMI Suitability to Meet the Project Need

Deployment of the AMI alternative would allow FEI to meet all the drivers for the Project need.

AMI will fully automate the meter reading function, significantly reducing the potential for errors while being far less intrusive for customers. In addition, there would be a reduction in GHG emissions by reducing the meter reading vehicles on the road. Billing accuracy will also be greatly improved and customer inquiries and service requests would be addressed in a timely manner.

4.3.2.5

AMI would provide the information to empower customers with timely access to energy use information for more effective decision-making and FEI will have the opportunity to offer customers enhanced DSM programs for a greater opportunity to support conservation and save money.

AMI would allow FEI to fully address growing uncertainty related to the Company's current meter reading model. FEI would also have certainty regarding its costs and supply of meters in the long-term. Additionally, customers and the Company would be able to benefit from any innovations that are developed in the long-term within the metering industry.

Further, AMI would provide the opportunity to advance a range of key operating benefits in areas such as system resiliency, system planning, system integrity and safety. Similarly, FEI would be able to offer enhanced billing options to customers.

The following section provides an overview of the financial analysis for the AMI alternative.

4.3.3

AMI Financial Analysis

The AMI financial analysis was performed based on a full COS Analysis, with the incremental COS being the difference between the total COS for AMI and Baseline.

The table below provides a summary of the NPV of the capital and operating costs for the AMI alternative compared to Baseline, over the 26-year analysis period.

Table 4-3: AMI Alternative: NPV of Capital and Operating Costs ($ millions)

Financial Summary	AMI
Capital Costs:	
Meter Capital	$560.1
Project Management	$35.2
Software Capital	$9.1
Network Capital	$17.1
Non-Meter Capital	$3.6
AFUDC	$16.1
Total Capital	**$641.1**

Financial Summary	AMI
O&M Costs:	
Meter Reading Costs	$79.1
Operations, Contact Centre and Meter Shop O&M	$14.6
New O&M	$97.9
Total O&M (incl. Capitalized Overhead)	**$191.6**
Baseline Capital[1]	**$434.1**
Baseline O&M[2]	**$327.1**
AMI Incremental Capital[3]	**$207.0**
AMI Incremental O&M Savings[4]	**($135.5)**

Notes:

[1] Appendix G-2, Page 1, Line 13

[2] Appendix G-2, Page 1, Line 21 less 16 percent for capitalized overheads[53]

[3] AMI Capital, $641.1, Less Baseline Capital $434.1

[4] AMI O&M, $191.6, Less Baseline O&M $327.1

The NPV of the revenue requirement associated with the above capital and O&M Is $1,356.6 million. When compared to the NPV of the Baseline revenue requirement of $1,303.3[54] million, the incremental NPV of the revenue requirement is an increase of $53.3 million, with an incremental levelized delivery rate increase of 0.442 percent.

The estimated capital and O&M costs are discussed in the sections below.

4.3.3.1 AMI Capital Costs

The estimated capital costs associated with the AMI alternative are as follows.

Meter Capital

Meter capital for the AMI alternative includes estimated costs of replacing each existing diaphragm meter with an advanced meter. Therefore, the capital cost includes the visit to replace each meter, the cost of the advanced meter, and a bypass valve and regulator when required.

This would include all material and installation costs for the meters, bypass valves and regulators. Since existing meters would be replaced as part of the AMI alternative, existing programs to replace regulators and install bypass valves would be accelerated and completed at the same time as meter replacement, realizing cost savings mainly as a result of efficiencies gained from the bulk purchase of bypass valves and regulators.

[53] FEI's current capitalized overhead rate is 16 percent, BCUC order G-319-20.
[54] Appendix G-4, schedule 10, line 25.

Meter capital costs under the AMI alternative are estimated to be $560.1 million on an NPV basis.

Project Management

Project management costs include estimated labour and support costs for both internal and external resources for the system design, project management, process and change management, quality assurance, field supervision and administrative functions of the AMI Project. Project management also includes costs for travel, supplies, facilities and vehicles.

Project management costs under the AMI alternative are estimated to be $35.2 million on an NPV basis.

Software Capital

Software capital costs are comprised of estimates of all required capital expenditures to design, install, test, and commission the software environments needed as part of the AMI alternative, as well as estimated development costs associated with integrating new AMI environments with existing FEI systems.

Software capital costs under the AMI alternative are estimated to be $9.1 million on an NPV basis.

Network and Non-Meter Capital

Network and non-meter capital costs are comprised of estimates of all network licence and setup costs, including network (as defined in Section 5.4.1.1) design and installation.

These costs cover miscellaneous non-meter hardware items, including gateways, transmitters, switches, and cathodic protection devices. These costs would also include handheld/drive-by meter reading devices to outfit vehicles throughout the FEI service territory that would be required to read individual meters that are not within network coverage.

Network and non-meter capital costs under the AMI alternative are estimated to be $20.7 million on an NPV basis.

4.3.3.2

AMI O&M Costs

Additional details supporting the AMI O&M costs are discussed below including the total NPV of the estimated costs for the 26-year analysis period.

Meter Reading

Meter reading costs include estimates for remote reading of meters using the proposed AMI alternative as well as costs to manually read any devices that are not within network coverage.

Meter reading costs under the AMI alternative are estimated to be $79.1 million on an NPV basis.

Operations, Contact Centre and Meter Shop O&M

This category of O&M activity includes estimates of costs associated with meter exchanges, operations, contact centre and meter shop work.

The gas shut-off valve in the advanced meter would enable FEI to realize cost savings related to this category of activity O&M. Remote shut off and turn on of gas flow would allow FEI to respond remotely to many issues occurring in the field, reducing the need to dispatch employees to attend customer premises.

Therefore, these O&M costs under the AMI alternative are estimated to be $14.6 million on an NPV basis.

New O&M

These estimated costs relate to work required to maintain and manage the AMI alternative and its integration with existing FEI systems. This includes SaaS[55] fees, software licensing, support, site leases for base station sites and bandwidth costs to connect field end points to the data centres.

New O&M costs are estimated to be $97.9 million on an NPV basis.

4.3.4 Summary of AMI Alternative

An AMI alternative would fully address all drivers of the Project need. AMI would provide a fully automated meter reading solution greatly reducing errors and increasing customer convenience. AMI would empower customers with timely energy usage capabilities and allow customers to participate in enhanced DSM programs. AMI would greatly reduce the risks and costs associated with FEI's current manual meter reading model while addressing the risk of obsolescence. Finally, AMI would allow FEI to advance key operating opportunities and enable the Company to offer customers the opportunity for enhanced billing options.

FEI's financial analysis of an AMI alternative demonstrates that the AMI Project could be deployed at an estimated $53.3 million increase in the NPV of the Company's revenue requirement, which amounts to an increase in customer rates by 0.442 percent on a levelized basis over the 26-year analysis period. FEI's financial and non-financial analysis of the AMI alternative demonstrates that for a comparative delivery rate impact of less than half a percent, customers and the Company will receive significant incremental benefits.

[55] Software as a Service is a software licensing and delivery model in which software applications are licensed on a subscription basis from a vendor.

A financial summary of FEI's alternatives analysis is presented in Table 4-5. Review of the alternative financials determined that:

- AMR has a smaller up front capital investment, lower operating costs and a small estimated rate reduction. However, it is unable to fully meet any of the drivers of the Project need to automate; and
- AMI provides a solution that meets all aspects of the Project need and does so for a comparable investment and with a delivery rate impact that is less than half a percent higher.

Table 4-5: Summary of Alternative Financials

	AMR	AMI
Capital Costs (NPV, $millions)		
Meter Capital	$541.1	$560.1
Project Management	$26.2	$35.2
Software Capital	$2.2	$9.1
Network Capital	$0.3	$17.1
Non-Meter Capital	$5.3	$3.6
AFUDC	$3.5	$16.1
Total Capital	**$578.8**	**$641.1**
O&M Costs (NPV, $millions)		
Meter Reading Costs	$100.9	$79.1
Operations, Contact Centre and Meter Shop O&M	$58.7	$14.6
New O&M	$8.8	$97.9
Total O&M (incl. Capitalized Overhead)	**$168.4**	**$191.6**
Incremental Capital (NPV, $millions)	**$144.7**	**$207.0**
Incremental O&M (NPV, $millions)	**($158.7)**	**($135.5)**
Incremental To Baseline Revenue Requirement (NPV, $millions)	**$7.2**	**$53.3**
Incremental Delivery Rate Impact (%)	**-0.059%**	**0.442%**

For all of the reasons summarized above, and given the small difference in delivery rate impact between the two alternatives, FEI proposes the AMI alternative as being the best long-term solution for customers.

Section 5 of this Application will describe FEI's proposed AMI alternative in detail.

6. PROJECT COSTS

6.1 *INTRODUCTION*

This section discusses the costs of the Project, including contingency, and the financial analysis. Within the financial analysis section, FEI provides the assumptions, the accounting treatment, and the estimated incremental delivery rate impact of the Project.

FEI approached the financial analysis for this Project by comparing two full cost scenarios, with the difference between the scenarios being the incremental financial impact of the Project. The first scenario is FEI's Baseline meter program that represents the costs FEI expects to incur if the AMI Project is not approved. The second relates to the proposed AMI Solution. FEI took this analytical approach because of the number of changes to both operating and capital costs that will take place with approval of the Project and the requirement to understand what the operating and capital costs would have been without the Project to determine the impact. The following discussion details the expected cost of the AMI Solution compared to the expected cost of the Baseline scenario, with the difference between the two being the expected incremental cost of the Project.

As discussed in Section 5.5, the Project implementation is scheduled to take four years. In addition to these four years of implementation, FEI will continue to incur development and regulatory proceeding costs up until deployment starts in 2024. For the purpose of this section and analysis, costs have been grouped into three phases:

1. Pre-deployment - the time period from 2021 to 2023. During this phase, costs are being incurred for Project development and for the regulatory proceeding;
2. Deployment – the time period from 2024 to 2026. These are the years in which the majority of the AMI meters will be deployed; and
3. Post-deployment – the time period from 2027 to 2046. This is the time period over which the new AMI meters are expected to be in service, based on the estimated useful life of the new AMI meters of 20 years. The majority of the financial benefits of the Project, consisting primarily of reduced meter reading costs, will be realized over this phase.

Only the costs in the Pre-deployment and Deployment phases are classified as the cost of the Project. The costs and savings in the Post-deployment phase are provided to evaluate the financial impact of the Project over the financial analysis period.

In the following Section 6.2, cost estimates are provided, followed by additional details supporting the estimates. In Section 6.3, the financial analysis discussion uses these cost estimates to calculate the estimated incremental delivery rate impact of the Project.

6.2 *PROJECT COSTS*

This section provides the expected capital and O&M costs of the AMI Solution, as well as the incremental costs when compared to the Baseline costs. Table 6-1 below summarizes the total estimated capital and O&M costs of the AMI Solution, the current Baseline meter program costs, and the incremental costs. Costs shown are in estimated as-spent dollars and include contingency and allowance for funds used during construction (AFUDC).

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 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	Reference [1] (6)
	AMI						
1	Capital[2]	128.3	624.1	752.5	119.2	871.6	Schedule 6,Line 44 + Schedule 9,Line 31+Line 39+Line 41+Line 43
2	O&M	57.7	52.7	110.3	234.4	344.7	Schedule 2,Line 13
	BASELINE						
3	Capital	80.5	104.4	184.9	563.9	748.8	Schedule 6,Line 28
4	O&M	53.9	59.5	113.4	554.0	667.3	Schedule 6,Line 12
	INCREMENTAL [3]						
5	Capital	47.9	519.7	567.6	(444.7)	122.9	Schedule 6,Line 39 + Schedule 9,Line 28+Line 36+Line 40
6	O&M	3.8	(6.8)	(3.0)	(319.6)	(322.6)	Schedule 2,Line 14

Notes:

[1] *Appendix G-3 contains the AMI financial schedules.*

Appendix G-4 contains the Baseline financial schedules.

Appendix G-5 contains the Incremental financial schedules.

[2] *Includes AMI Application and Development deferral additions and AFUDC.*

[3] *Incremental cost AMI Solution less Baseline.*

As shown in Table 6-1, the AMI Solution capital cost is estimated at $752.5 million[59] compared to the Baseline capital cost of $184.9 million[60] with the incremental capital cost of the Project estimated as $567.6 million[61]. Additionally, there is an estimated incremental O&M reduction over the Pre-deployment and Deployment phases of $3.0 million[62].

During the Post-deployment phase, FEI estimates reduced capital spending of $444.7 million[63]. FEI also estimates Post-deployment incremental O&M savings of $319.6 million[64].

When considering the entire life cycle of the Project, there is an estimated reduction in costs of $199.7 million[65].

[59] Table 6-1, column 3, line 1.
[60] Table 6-1, column 3, line 3.
[61] Table 6-1, column 3, line 5.
[62] Table 6-1, column 3, line 6.
[63] Table 6-1, column 4, line 5.
[64] Table 6-1, column 4, line 6.
[65] Table 6-1, column 5, line 5 + column 5, line 6.

FEI has prepared the cost estimates based on AACE Class 3 specifications in accordance with the BCUC's CPCN Guidelines. Cost estimates are based on a mix of negotiated contract prices, FEI current costs adjusted for inflation, and FEI's estimates of future expected costs.

Further details on the costs set out in Table 6-1 are provided in Section 6.2.1 for capital costs and Section 6.2.2 for O&M costs.

Capital Costs

This section provides information supporting the capital costs introduced in Table 6-1 above. The capital cost is made up of the following categories:

6.2.1

1. Meter Capital which is composed of meter hardware, meter installation, bypass valve hardware and installation, and a contact centre booking charge. This capital is discussed further in Section 6.2.1.1;
2. AMI Project Management discussed in Section 6.2.1.2;
3. AMI Network & Software discussed in Section 6.2.1.3;
4. Non-Meter Capital discussed in Section 6.2.1.4; and
5. Meter Reading Capital, which is only applicable to the Baseline scenario, and is discussed in Section 6.2.1.5.

Table 6-2 below summarizes the detailed AMI Solution, Baseline, and incremental Project capital. As the investment in the Project will result in substantial savings Post-deployment, these estimates have also been included in the table.

Table 6-2: Capital Cost Summary

Project Capital Costs As-Spent in $Millions		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)	
Line	Item	2021 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	Reference [1] (6)
1	Meter Capital	81.1	564.6	645.7	111.6	757.3	Schedule 6, Lines 3 through 9
2	AMI Project Management	27.8	25.9	53.7	-	53.7	Schedule 6, Lines 13 through 17 + Schedule 9 Lines 31+39+41
3	AMI Network & Software	16.2	11.8	28.0	6.4	34.4	Schedule 6, Lines 10 through 11
4	Non-Meter Capital	1.2	2.4	3.6	1.2	4.8	Schedule 6, Line 12
5	AFUDC	1.4	19.5	20.8	-	20.8	Schedule 6, Line 36 + Schedule 9 Line 43
6	**AMI Solution**	**127.7**	**624.1**	**751.8**	**119.2**	**871.0**	Sum of Lines 1 through 5
7	Meter Capital	79.6	102.0	181.5	545.6	727.1	Schedule 6, Lines 1 through 5
8	Non-Meter Capital	0.9	2.4	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**	**80.5**	**104.4**	**184.9**	**563.9**	**748.8**	Sum of Lines 7 through 9
11	Meter Capital	1.6	462.6	464.2	(434.0)	30.2	Line 1 less Line 7
12	AMI Project Management	27.8	25.9	53.7	-	53.7	Line 2
13	AMI Network & Software	16.2	11.8	28.0	6.4	34.4	Line 3
14	Non-Meter Capital	0.3	(0.0)	0.2	(2.0)	(1.8)	Line 4 less Line 8
15	AFUDC	1.4	19.5	20.8	-	20.8	Line 5
16	Meter Reading Capital	-	-	-	(15.1)	(15.1)	Line 9
17	**Project Costs[2]**	**47.2**	**519.7**	**567.0**	**(444.7)**	**122.3**	Sum of Lines 11 through 16 [3]

Notes:

[1] *Appendix G-3 contains the AMI financial schedules*
Appendix G-4 contains the Baseline financial schedules
Appendix G-5 contains the Incremental financial schedules

[2] *Incremental cost AMI solution less Baseline*

[3] *AMI Project Management has been allocated to asset accounts in incremental financial schedules. Detail in lines 11-14 are before Project Management allocation and do not agree to amounts in the incremental financial schedules that are after allocation of project management. The reference for Line 17 that agrees to financial schedules is Schedule 6, Line 39 + Schedule 9, Lines, 28+36+38 +40.*

As shown in the table above, the AMI Solution capital cost is estimated at $751.8 million[66] and the incremental Project capital cost is estimated at $567.0 million[67]. The Project is estimated to generate incremental net savings of $444.7 million[68] in capital spending over the Post-deployment phase.

The AMI Solution capital costs include contingency and AFUDC. Section 5.7 discussed project risk and described FEI's approach to determining contingency. FEI has included $34.3 million[69] in contingency through deployment of the Project allocated to meter capital, AMI project management, network & software, and non-meter capital. AFUDC is discussed in Section 6.3.2.1 below.

The sections that follow provide additional details supporting the costs included in each of the capital categories. Confidential Appendix G-1 and G-2 contains the detailed calculations for the capital and O&M costs used in this analysis.

6.2.1.1 Meter Capital

The meter capital cost is the largest portion of Project capital costs. The AMI Solution meter capital cost is estimated at $645.7 million[70] which is $464.2 million[71] higher than what is estimated to be spent in the Baseline estimate of $181.5 million[72]. This incremental cost is offset by an estimated $434.0 million[73] in meter capital savings in the Post-deployment period driven by the decreased volume of meter exchanges.

Meter capital has been forecast on a unit basis for both meter exchanges and new customer additions. Table 6-3 below summarizes the estimated number of meter exchanges and new meter additions expected in both the AMI and Baseline scenarios during the Pre-deployment, Deployment, and Post-deployment phases.

[66] Table 6-2, column 3, line 6.
[67] Table 6-2, column 3, line 17.
[68] Table 6-2, column 4, line 17.
[69] Section 5.7.4 .
[70] Table 6-2, column 3, line 1.
[71] Table 6-2, column 3, line 11.
[72] Table 6-2, column 3, line 7.
[73] Table 6-6, column 4, line 11.

Table 6-3: Meter Unit Summary

Meter Units 000's		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)
Line	Item	2021 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)
1	Meter Exchanges	135.0	1,008.6	1,143.6	106.6	1,250.2
2	New Meters	34.3	31.8	66.0	144.6	210.6
3	**Total AMI Meter Units**	**169.3**	**1,040.4**	**1,209.6**	**251.2**	**1,460.9**
4	Meter Exchanges	135.0	169.0	304.0	894.2	1,198.2
5	New Meters	34.3	31.8	66.0	144.6	210.6
6	**Total Baseline Meter Units**	**169.3**	**200.8**	**370.0**	**1,038.8**	**1,408.8**
7	Meter Exchanges	-	839.6	839.6	(787.6)	52.0
8	New Meters	-	-	-	-	-
9	**Incremental Units**	**-**	**839.6**	**839.6**	**(787.6)**	**52.0**

For the AMI Project, FEI expects to complete an estimated 1.1 million[74] meter exchanges in the first two phases of the Project and an estimated 106 thousand[75] exchanges Post-deployment. The number of meter exchanges over the Baseline is an estimated incremental 840 thousand[76] through the Deployment phase, offset by a reduction of 788 thousand[77] meter exchanges in the Post-deployment phase.

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.

In Table 6-3, FEI has also shown the estimated new customer addition meters, and used the same volume assumption for both AMI and Baseline resulting in no incremental volume change for new meter additions.

Meter capital consists of meter hardware, meter installation, bypass valve hardware and installation, and the capitalized cost of contact centre meter exchange bookings. Each of these items is discussed separately below.

Meter Hardware

Meter hardware consists of meters, regulators, and large commercial and industrial meter AMI modules. 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. FEI's current meters, the new AMI meters, and large meter modules are sourced in US dollars

[74] Table 6-3, column 3, line 1.
[75] Table 6-3, column 4, line 1.
[76] Table 6-3, column 3, line 9.
[77] Table 6-3, column 4, line 9.

and have been included in the cost estimate in CAD dollars.[78] Specific to the AMI Solution, the AMI meters and larger meter modules have been negotiated to have fixed term pricing through Deployment. 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.

Meter Installation

Meter installation consists of the costs to install meters, regulators, and large meter modules. As discussed in Section 5.3.3.2, 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 current local contractor pricing as well as related costs. Schedules 2.1, 2.2, and 2.3 in confidential Appendix G-1 contain the detailed assumptions for meter installation. Schedule 2.2 contains the detail supporting the incremental cost of installing the AMI meters.

Bypass Valve Hardware and Installation

As described in Section 5.3.3.3, bypass valve installation is part of the standard meter exchange activity. The AMI Project accelerates the meter exchange process and, as a result, also accelerates the timing of the planned installation of bypass valves to the Deployment phase of this Project. Currently, bypass valves are deployed on an estimated 20 percent of FEI's meter fleet. The AMI Project will see full deployment of bypass valves on existing meters sooner than would be achieved in FEI's Baseline meter program. The incremental cost of deploying the bypass valves sooner than would be achieved under the Baseline scenario results in incremental savings in the Post-deployment capital spending. The savings are predominantly driven from avoided inflation on the cost of the bypass valves, fixed pricing through Deployment, and efficiencies in installation achieved through the mass AMI meter deployment.

Contact Centre Bookings Charge

A small unit cost for each meter exchange booked through FEI's customer contact centre is capitalized and added to meter installation. This unit cost has been included in the financial model using current costs escalated by inflation annually.[79] During the Deployment phase, the increased volume of meter exchanges will drive an increase in this charge; whereas during the Post-deployment phase, there will be an offsetting decrease in this charge associated with a decreased volume of meter exchanges.

6.2.1.2

AMI Project Management

AMI Project management only applies to the AMI Solution and is therefore only an incremental cost in the financial analysis. AMI Project management costs include resources (project team incremental labour), consulting and legal costs, and miscellaneous costs such as travel,

[78] Based on foreign exchange discussed in Section 6.3.1.4.
[79] Section 6.3.1.2 discusses inflation rate.

O&M Costs

With the implementation of the AMI Project, there will be a net O&M savings in all phases, with significant savings in the Post-deployment phase primarily from reduced costs of manual meter reading. This section discusses the incremental O&M expenses FEI expects to incur, and the offsetting savings identified in the following O&M categories:

6.2.2

1. New AMI O&M including incremental labour, AMI software, and AMI network discussed in Section 6.2.2.1;
2. Meter installation O&M discussed in Section 6.2.2.2;
3. Meter reading O&M discussed in Section 6.2.2.3;
4. Operations O&M discussed in Section 6.2.2.4;
5. Customer service O&M discussed in Section 6.2.2.5; and
6. Meter shop O&M discussed in Section 6.2.2.6.

Table 6-5 below summarizes the net O&M savings expected as a result of this Project. FEI notes these amounts are after reducing the gross amounts for capitalized overheads.[90]

Table 6-5: Incremental O&M Savings Summary

Incremental O&M[1] As-Spent in $Millions		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)	
Line	Item	2021 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	Reference[2] (6)
1	New AMI O&M	4.3	18.0	22.2	152.5	174.7	
2	Meter Installation O&M	-	(2.3)	(2.3)	(22.6)	(25.0)	
3	Meter Reading O&M	-	(21.1)	(21.1)	(404.4)	(425.5)	
4	Operations O&M	(0.1)	(0.6)	(0.6)	(25.8)	(26.4)	
5	Customer Service O&M	0.1	-	0.1	(12.7)	(12.6)	
6	Meter Shop O&M	(0.5)	(0.8)	(1.3)	(6.5)	(7.8)	
7	**Incremental O&M costs / (savings)**	**3.8**	**(6.8)**	**(3.0)**	**(319.6)**	**(322.6)**	Schedule 2, Line 14 & Agrees to Table 6-1 Line 6

Notes:

[1] *O&M costs net of capitalized overheads.*

[2] *Appendix G-5 contains the incremental financial schedules.*

As shown above, FEI estimates incremental savings in total O&M through the Pre-deployment and Deployment phases of $3.0 million[91] and a further $319.6 million[92] in savings through the Post-deployment phase.

The sections below will discuss each O&M item in more detail.

[90] FEI's current capitalized overhead rate is 16 percent, BCUC order G-319-20.
[91] Table 6-5, column 3, line 7.
[92] Table 6-5, column 4, line 7.

New AMI O&M

The new O&M that will be incurred as a result of the implementation of AMI includes incremental internal labour, AMI network O&M, and AMI software O&M.

6.2.2.1

- **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[93] 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[94] 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.[95]

- **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[96] 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.[97]

6.2.2.2

Meter Installation O&M

Currently, FEI allocates 14 percent of the meter exchange installation cost to O&M and this has been included in both the AMI Solution and Baseline scenario. However, for the AMI Solution, the incremental meter exchange activities in the Deployment phase are not allocated to O&M, as these activities are incremental to normal operation. All of the exchanges in the Post-deployment phase are allocated 14 percent to O&M.

FEI estimates $2.3 million[98] in savings related to meter installation O&M through the Deployment phase and an additional $22.6 million[99] in savings Post-deployment. The Deployment phase savings result from the full cost of the incremental meter exchanges being allocated to capital. The Post-deployment savings result from reduced meter exchanges in this phase.

[93] Section 6.3.1.2.
[94] Section 6.3.1.2.
[95] Section 6.3.1.4.
[96] Section 6.3.1.2.
[97] Section 6.3.1.4.
[98] Table 6-5, column 3, line 2.
[99] Table 6-5, column 4, line 2.

Meter Reading O&M

Meter reading is the largest component of O&M costs impacted by the AMI Project and the area with the largest savings. Meter reading O&M presented here consists of the manual costs of reading meters and the cellular costs for current large commercial and industrial meters.

6.2.2.3

Table 6-6 below summarizes the estimated incremental meter reading costs / (savings), and the discussion that follows provides additional details for each of the phases of the Project.

Table 6-6: Meter Reading O&M Summary

Meter Reading O&M[1] As-Spent in $Millions		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)
Line	Item	2021 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)
1	Meter Reading	38.7	21.8	60.5	29.1	89.6
2	Large Commercial / Industrial Cellular	1.5	0.9	2.4	1.1	3.5
3	**AMI Meter Reading O&M**	**40.2**	**22.7**	**62.9**	**30.3**	**93.1**
4	Meter Reading	38.7	42.2	80.9	432.5	513.4
5	Large Commercial / Industrial Cellular	1.5	1.6	3.1	2.1	5.2
6	**Baseline Meter Reading O&M**	**40.2**	**43.8**	**84.0**	**434.6**	**518.6**
7	Meter Reading	-	(20.4)	(20.4)	(403.4)	(423.8)
8	Large Commercial / Industrial Cellular	-	(0.7)	(0.7)	(1.0)	(1.7)
9	**Incremental Meter Reading O&M**	**-**	**(21.1)**	**(21.1)**	**(404.4)**	**(425.5)**

Notes:

[1] *O&M costs net of capitalized overheads.*

Pre-deployment Phase

FEI expects an immaterial amount of savings in the Pre-deployment phase, limited to the large commercial and industrial meter modules starting to be deployed in 2022, which results in a reduction in current cellular reading costs for those meters that move to the new AMI network.

Deployment Phase

In the Deployment phase, FEI expects $21.1 million[100] in meter reading O&M savings. These savings result from the reduction in volume of non-AMI meters that require manual reads as they are exchanged with an AMI meter that will be read remotely via the proposed network. The savings estimate is based on FEI's current outsourced meter reading cost including inflation[101] less the cost of any AMI meters that may need to be manually read. 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. For the purpose of this analysis, FEI has also assumed FEI's operations field crews will

[100] Table 6-6, column 2, line 9.
[101] Section 6.3.1.2.

Operations O&M

Operations O&M refers to O&M activities completed by FEI's field crews.

FEI's Operations team conducted a review of current activities and identified several activities that would be reduced with the functionality introduced within the AMI Project. Reduced activities
6.2.2.4 include meter trouble calls, meter reads, meter identifications, disconnects, unlocks, cathodic protection data gathering, and odour measurement.

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]

Table 6-7 below summarizes the reduction in existing Operations O&M and the incremental Operations O&M included in the financial analysis.

Table 6-7: Operations O&M Summary

Operations O&M[1] As-Spent in $Millions		Pre Deployment	Deployment	Subtotal (1+2)	Post Deployment	Total (3+4)	
Line	Item	2021 - 2023 (1)	2024 - 2026 (2)	2021 - 2026 (3)	2027 - 2046 (4)	2021 - 2046 (5)	Reference (6)
1	Existing Operations Activities	(0.1)	(0.6)	(0.6)	(54.0)	(54.6)	
2	New Operations Activities	-	-	-	28.2	28.2	
3	**Incremental Operations O&M costs / (savings)**	**(0.1)**	**(0.6)**	**(0.6)**	**(25.8)**	**(26.4)**	Agrees to Table 6-6 Line 4

Notes:

[1] *O&M costs net of capitalized overheads.*

As shown in the above table, through the Deployment phase, FEI expects minimal savings, estimated at $0.6 million, mainly enabled by the SentryPoints[108] installed on the gas network that will reduce cathodic protection activities.

The majority of the Operations O&M savings in the Post-deployment phase, estimated in total at $25.8 million, come from a reduction in Operations activities.

6.2.2.5

Customer Service O&M

The AMI Project will enable savings in FEI's customer service function. Customer service identified savings will come from the following reduced activities: billing investigation and exceptions, meter reading coordinator workload, improvements in vacant premises processing, and meter switching identification and validation.

FEI estimates incremental costs in customer service O&M through the Deployment phase of $0.1 million[109] related to AMI process training. Post-deployment savings are estimated at $12.7 million[110].

[107] 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.
[108] Section 5.4.1.1.
[109] Table 6-5, column 3, line 5.
[110] Table 6-5, column 4, line 5.

notes the proposed new rates for AMI software and AMI Communication and Equipment[120] have been assumed to be equivalent to the rates FBC uses for similar assets. 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.

Accounting Treatment

Treatment of Capital Costs

6.3.2 Consistent with FEI's approved CPCN treatment, the capital costs of the Project will be held outside of rate base in capital work in process, attracting AFUDC, until they are placed into 6.3.2.1 service. As construction is completed on the various assets included in the Project, the assets will be commissioned and placed into service. The assets will enter rate base on January 1 of the year following their in-service date by adding the capital cost of the assets into the appropriate plant asset accounts. Depreciation of the assets included in FEI's rate base will begin the year that they enter rate base. The AMI meters exchanged during the Deployment phase of the Project will enter rate base January 1 in the year following the date of the meter installation.

AMI Application and Feasibility Cost Deferral

6.3.2.2

In this Application, FEI seeks approval for the creation of the AMI Application and Feasibility Cost deferral account. The purpose of this account is to capture costs associated with developing the AMI Project and the regulatory proceeding to review the Application. Similar to the capital costs discussed above, the account will be non-rate base and earn an after tax WACC carrying cost until it enters rate base. FEI expects to incur costs of approximately $10.3 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 on January 1 following BCUC Decision 6.3.2.3 and proposes to amortize the costs accrued to this account over three years.

AMI Foreign Exchange (FX) Mark to Market Valuation

FEI is also seeking BCUC approval under sections 59-61 of the UCA for a deferral account, entitled the "AMI FX Mark to Market" deferral account, to capture the mark-to-market valuation of any foreign currency risk mitigation contracts (FX Contracts) entered into related to the Project. The deferral account is an important tool to mitigate external income statement volatility that would arise with the use of FX Contracts. This treatment is similar to what the BCUC approved for the

[120] The proposed asset class that will hold the AMI network and non-meter capital.

Mt. Hayes LNG Facility CPCN[121] and the Customer Care Enhancement CPCN[122] and is similar to what FEI has proposed in the TLSE Project Application.[123]

A significant portion of the costs of the Project includes US Dollar (USD) payments giving rise to exchange rate risk. Table 6-9 below summarizes the estimated value of USD exposure through deployment of the Project.

Table 6-9: US Dollar Exposure

US Dollar Exposure ($millions)	2021	2022	2023	2024	2025	2026	Total
Total US Dollar Exposure included in costs	6.6	8.3	22.0	85.7	80.6	80.6	283.8

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. The extent of currency risk mitigation will be based on FEI's risk assessment of the overall exposure as well as the cost and effectiveness of the FX Contracts.

While using FX Contracts will help mitigate the risk of exchange rate differences, these types of contracts are considered derivative instruments under FASB Accounting Standards Codification 815, Derivatives and Hedging, which would require FEI to record a fair value (mark-to-market) entry at the end of each accounting period. In the absence of an approved deferral account, those mark-to-market adjustments would be included in FEI's earnings for the period.

Due to the potential volatility in FEI's external financial statements arising from the required recognition of mark-to-market valuation of FX Contracts, FEI requests approval of a deferral account to capture these mark-to-market adjustments over the course of the Project. 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.

The requested deferral account is beneficial to FEI and its customers. It allows FEI to mitigate the impact on its external financial statements arising from undertaking the hedging of the USD denominated payments during the Project execution. By doing so, it facilitates the use of FX

[121] Order G-145-08.
[122] Order G-96-10.
[123] Filed with the BCUC on December 29, 2020. A revised redacted version was filed on March 25, 2021.

Contracts that will provide increased certainty to customers on the exchange rate used for the USD portion project costs.

FEI will report on the use of this deferral account as part of the Project progress reports filed with the BCUC.

Accounting Treatment for Retirement of Existing Meters

As part of the AMI Project, existing meters will be replaced with new AMI meters. Therefore, the financial analysis includes the recovery of the remaining rate base value associated with the existing in-service series 200 and 400 meters, and also the rate base value of meters embedded in accumulated depreciation that have been previously retired (due to the group accounting method employed by FEI). Each of these items is discussed separately below.

6.3.2.4

Recovery of Existing Meters

FEI has considered two options for the recovery period of the remaining rate base value of existing meters to be removed from service as part of the proposed AMI Project. In both cases, the existing meters would be removed from service as they are replaced over the 2024-2026 period, with the remaining net book value for the retired meters transferred to a new rate base deferral account named "Existing Meter Cost Recovery". 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.

FEI is proposing an amortization period of 5 years, and has assumed this treatment in the financial analysis for the Project. 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 $87 million[124].

Recovery of Previously Retired Meters

In addition to the recovery of the remaining rate base value for meters to be retired due to the AMI Project, there is approximately $74 million[125] 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.[126] With the existing meters

[124] Table 6-10, Line 9.
[125] Table 6-10, Line 10.
[126] The approved regulatory treatment at the time of retirement is to credit plant in service and debit accumulated depreciation such that the remaining net book value remains in accumulated depreciation and is taken into account in future depreciation studies to recover the costs over a future period. The amounts represent unrecovered depreciation.

being retired due to the AMI Project and to continue recovery of the aforementioned remaining rate base value as approved, FEI proposes to transfer this balance to a new rate base deferral account named the "Previously Retired Meter Cost Recovery" deferral account, with an amortization period of 10 years, which 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.

Table 6-10 below provides a continuity view of the existing in service meter hardware and installation asset values including the proposed transfers to recovery deferrals.

Table 6-10: Existing Meter Asset Continuity ($ millions)

Line	Non-AMI Meter Losses	2021	2022	2023	2024	2025	2026	Total	Reference[1]
1	Beg Hardware and Installation[2]	429.0	427.8	426.9	408.7	272.5	136.2		Schedule 7, Line 4 + Line 5
2	Additions	17.5	17.6	-	-	-	-		Schedule 7, Line 23 + Line 24
3	Retirements	(18.7)	(18.5)	(18.2)	(136.2)	(136.2)	(136.2)		Schedule 7, Line 41 + Line 42
4	End Hardware and Installation	427.8	426.9	408.7	272.5	136.2	-		Schedule 7, Line 59 + Line 60
5									
6	Accumulated Depreciation, Beginning[3]	(177.4)	(184.3)	(191.3)	(207.5)	(154.6)	(85.2)		Schedule 8, Line 4 + Line 5
7	Depreciation	(25.6)	(25.5)	(25.5)	(24.4)	(16.3)	(8.1)		Schedule 8, Line 23 + Line 24
8	Retirement	18.7	18.5	18.2	136.2	136.2	136.2		Line 3
9	**Existing Meter Write Off[4]**	-	-	**(5.8)**	**(35.3)**	**(26.9)**	**(19.3)**	**(87.3)**	Schedule 9, Line 13
10	**Previously Retired Meter Write Off[5]**	-	-	**(3.2)**	**(23.6)**	**(23.6)**	**(23.6)**	**(74.0)**	Schedule 9, Line 4
11	Accumulated Depreciation, Ending	(184.3)	(191.3)	(207.5)	(154.6)	(85.2)	-		Schedule 8, Line 61 + Line 62
12									
13	NBV, Beginning[6]	251.6	243.5	235.6	201.2	117.8	51.1		Line 1 + Line 6
14	NBV, Ending	243.5	235.6	201.2	117.8	51.1	-		Line 4 + Line 11

Notes:

[1] *Appendix G-3, AMI Financial Schedules.*

[2] *Beginning plant values of 163.3 + 265.7 as reported in Section 6.3.1.5.*

[3] *Beginning plant values of 90.3 + 87.1 as reported in Section 6.3.1.5.*

[4] *Line 9 sums to $87.3.*

[5] *Line 10 sums to $74.0.*

[6] *Beginning plant values of 72.99 + 178.6 as reported in Section 6.3.1.5.*

6.3.3 Estimated Delivery Rate Impact

Using the cost information, assumptions, and regulatory accounting treatment discussed in this section, 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. Table 6-11 below summarizes the NPV of the annual revenue requirements over the term of the analysis (26 years) for each of the scenarios and includes the levelized delivery rate impact for each. The variance between the two represents the incremental impact from the AMI Project.

Table 6-11: Levelized Delivery Rate Impact

Levelized Rates	AMI	Baseline	Incremental
NPV Annual Revenue Requirement millions	1,357	1,303	53
Levelized % Increase 2021 Rates	11.256%	10.814%	**0.442%**

The estimated incremental delivery rate impact expected over the 26-year analysis period for the AMI Project is 0.442 percent when compared to 2021 rates. In 2027, the year after full AMI deployment, the cumulative delivery rate impact would be at its highest level of 6.27 percent, resulting in a cumulative annual average bill increase of $28.5 dollars for a residential customer consuming 90 GJs per year. Each year thereafter, the cumulative delivery rate impact would decrease resulting in an overall average of 0.442 percent per year over the 26-year analysis period. The year 2034, two years after the proposed "Existing Meters Cost Recovery" deferral account has been fully amortized, will be the first year the incremental delivery rate impact will be a decrease.

Delivery Rate Impact Sensitivity to Future Meter Reading Savings

6.3.3.1 FEI notes the incremental delivery rate impact is sensitive to the underlying inputs. Specifically, the rate impact analysis is sensitive to the underlying input used for future meter reading savings. For the reasons set out in Section 3.3.3, and further described in Section 6.2.2.3, FEI has included in the Baseline scenario the cost of bringing manual meter reading in-house starting in 2027. The cost assumptions used in the Baseline scenario are based on FEI's low case cost estimate. FEI has provided Table 6-12 below summarizing the delivery rate impact associated with the variability in the assumption regarding future meter reading savings.

Table 6-12: In-House Meter Reading Scenario Delivery Rate Impact Sensitivity

Line	Meter Reading Costs Scenario	Baseline Impact	AMI Impact	Incremental Impact
1	Continuation of current embedded costs	0.000%	0.617%	0.617%
2	Future in-house meter reading low case	0.174%	0.617%	0.442%
3	Future in-house meter reading high case	0.769%	0.617%	-0.153%

The analysis discussed in this section is based on line 2 and results in the incremental impact of 0.442 percent. If FEI were to use the high case cost estimate for future in-house meter reading, the incremental delivery rate impact would decrease by 0.60 percent to a levelized delivery rate decrease of 0.153 percent. FEI has also provided the delivery rate impact associated with the unlikely scenario of maintaining the current cost of outsourced manual meter reading embedded in FEI's current O&M costs on line 1.

6.3.3.2

Fort Nelson Impact

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. Direct charges include meter capital, meter installation, any associated meter write off, and network hardware. Common capital items, such as software and Project management costs will be allocated to Fort Nelson based on the number of meters deployed. O&M items such as the reduced meter reading costs and annual network servicing costs will be allocated to Fort Nelson based on the number of customers. These allocation approaches are consistent with current allocation methods for Fort Nelson. Fort Nelson's cost of the project is estimated at $1.8 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 1.08 percent.

6.4 *SUMMARY*

In summary, the AMI Project is expected to incur $752.5 million in capital expenditures through the Deployment phase, which is equal to $567.6 million incremental to what would otherwise be spent under the Baseline scenario (during normal operations of the existing meter program). The $567.6 million of incremental capital is projected to be offset by future savings in capital and O&M expenditures in the Post-deployment phase.

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 0.442 percent using conservative assumptions. There would be an overall delivery rate savings for customers if the future cost of manual meter reading is higher than the Baseline low case cost scenario that has been assumed.

Specific approvals sought in light of the discussion in this section include:

- The creation of four new asset accounts with associated depreciation and net salvage rates:
    1. 478-10 / AMI Meter Hardware – depreciation rate set to 5 percent, no net salvage;
    2. 474-00 / AMI Meter Installation – depreciation rate set to 5 percent, 1.58 percent net salvage;
    3. 402-06 / AMI Software – depreciation rate set to 10 percent;[127]
    4. 488-30 / AMI Communications and Equipment – depreciation rate set to 6.67 percent, no net salvage;
- Creation of a non rate base **AMI Application and Feasibility** cost deferral account attracting a 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 3 years;

[127] There is no net salvage for software as there are no associated removal costs.

Appendix C

UPDATED WORKING EXCEL MODELS
EVIDENTIARY UPDATE JULY 5, 2022

REFER TO LIVE SPREADSHEET MODELS

Provided in electronic format only

FILED CONFIDENTIALLY