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Verlon G. Otto
Director, Regulatory Affairs

Via E-mail and Courier

October 10, 2019

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

File No.: 4.2(2019)

Attention: Patrick Wruck
Commission Secretary and Manager, Regulatory Services

Dear Mr. Wruck:

Re: Pacific Northern Gas (N.E.) Ltd.
Application for a Certificate of Public Convenience and Necessity to Implement Automated Meter Reading (AMR) Infrastructure

Pacific Northern Gas (N.E.) Ltd. (PNG(NE)) hereby encloses ten copies of its application (Application) to the British Columbia Utilities Commission (BCUC) for approval of a Certificate of Public Convenience and Necessity (CPCN), pursuant to Sections 45 and 46 of the *Utilities Commission Act* (Act), for net capital expenditures of approximately $4.1 million to update and replace the current manual meter reading process for residential and commercial customers in the northeastern British Columbia communities it serves, including Fort St. John, Dawson Creek and Tumbler Ridge, with automated meter reading (AMR) infrastructure (AMR Project).

Background

PNG(NE) is committed to making improvements that positively impact the safety, efficiency and reliability of its natural gas service. While PNG(NE)'s existing manual meter reading process has been reliable and has produced adequate results for customers, PNG(NE) has determined that the implementation of AMR technology is a prudent decision when the potential benefits are considered.

AMR has been around for many years as a solution to improve the efficiency and accuracy of the meter reading process. The technology has evolved over time and is available for water, gas and electric, as well as multi-commodity utilities. PNG(NE)'s primary objectives for giving consideration to the automation of the meter reading function include achieving operational efficiencies and improving employee safety, while also improving customer satisfaction.

PNG(NE)'s evaluation considered two alternatives to its manual meter reading process: 1) AMR, and 2) Advanced Metering Infrastructure (AMI). PNG(NE) determined that AMR was the preferred solution as the capital cost for implementation of an AMI solution was found to be

considerably greater than the cost of implementing an AMR solution, primarily due to the AMI requirement for high-cost, new intelligent meters capable of two-way communication and to the requirement to establish a communications network. Further, PNG(NE) was less focused on the AMI abilities of two-way communication and gathering supplementary operational data. Although these abilities offer incremental non-financial benefits, they can only be realized at a significant incremental cost. In consideration of the points noted, PNG(NE) has proposed the implementation of an AMR solution rather than an AMI solution.

Proposed Regulatory Review Process

PNG is hopeful that it will have BCUC approval no later than December 31, 2019, in order to accommodate the project schedule presented in Section 3.3.1 that anticipates procurement of materials in January 2020. Under the BCUC's 2015 Certificate of Public Convenience and Necessity Application Guidelines (CPCN Guidelines), the BCUC has discretion as to whether or not hearings are held on an application. Should the BCUC consider it necessary to proceed with a hearing on this Application, PNG(NE) supports a written hearing process with one or two rounds of information requests. PNG(NE) is open to processes that may facilitate an expeditious and efficient review, including the possibility of a meeting or workshop to review the Application with BCUC staff.

PNG(NE) notes that it has copied the British Columbia Old Age Pensioners' Organization *et al.* (BCOAPO), the sole registered intervener in the PNG(NE) 2018-2019 revenue requirements application proceeding, on this Application.

CPCN Approval is in the Public Interest

PNG submits that the approvals sought in this Application are in the public interest. Based on PNG(NE)'s analysis, existing customers will benefit from the implementation of the AMR Project, with the benefits to be realized primarily in the form of the positive rate impacts arising from a net reduction in operating costs. Quantitative factors supporting PNG(NE)'s proposal to proceed with the AMR Project include:

- Over a 20-year analysis period, the AMR Project will provide net operating and maintenance cost savings with a NPV of approximately $2.2 million;
- Once fully implemented, on a net basis, the AMR Project will provide significant operating and maintenance cost savings, averaging $657,000 per year; and
- Residential customers will realize annual cost savings of approximately $8 over the 20-year life of the project.

In addition to these financial aspects, the reduced number of meter reading staff and vehicles will reduce employee exposure hours to potentially hazardous conditions, both at customer premises and on the road. Further, the reduction in vehicles will contribute to a reduction in greenhouse gas emissions and the overall environmental impact of PNG(NE)'s meter reading activities. Lastly, AMR will allow for timely collection of customer usage data and will eliminate

the risk of bill errors resulting from manual entry errors, both factors are expected to contribute to an improvement in customer satisfaction.

Summary of Approval Sought

PNG(NE) submits that the proposed AMR Project is in the public interest and respectfully requests that the BCUC approve a CPCN, pursuant to Sections 45 and 46 of the Act, for capital expenditures of approximately $4.1 million to update and replace the current manual meter reading process for residential and commercial customers with AMR infrastructure.

If you require further information or have any questions regarding this submission, please contact the undersigned.

Yours truly,

Verlon G. Otto

cc: Leigha Worth (BCPIAC) – BCOAPO (E-mail only)

Encls. (10)

PACIFIC NORTHERN GAS (N.E.) LTD.

Application to the
British Columbia Utilities Commission
for a Certificate of Public Convenience and Necessity
to Implement Automated Meter Reading (AMR)
Infrastructure

October 10, 2019

TABLE OF CONTENTS

Executive Summary

Pacific Northern Gas (N.E.) Ltd. (PNG(NE)) hereby applies to the British Columbia Utilities Commission (BCUC), pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), for approval for capital expenditures of approximately $4.1 million to update and replace the current manual meter reading process for residential and commercial customers with automated meter reading (AMR) infrastructure in the northeastern British Columbia communities it serves, including Fort St. John (FSJ), Dawson Creek (DC) and Tumbler Ridge (TR) (Application).

PNG(NE) is committed to making improvements that positively impact the safety, efficiency and reliability of its natural gas service. While PNG(NE)'s existing manual meter reading process has been reliable and has produced adequate results for customers, PNG(NE) has determined that the implementation of AMR technology is a prudent decision when the potential benefits are considered.

AMR has been around for many years as a solution to improve the efficiency and accuracy of the meter reading process. The technology has evolved over time and is available for water, gas and electric, as well as multi-commodity utilities. PNG(NE)'s primary objectives for giving consideration to the automation of the meter reading function include achieving operational efficiencies and improving employee safety, while also improving customer satisfaction.

PNG(NE)'s evaluation considered two alternatives to its manual meter reading process: 1) AMR, and 2) Advanced Metering Infrastructure (AMI). PNG(NE) found the capital cost for implementation of an AMI solution to be considerably greater than the cost of implementing an AMR solution, primarily due to the AMI requirement for high-cost, new intelligent meters capable of two-way communication and to the requirement to establish a communications network. Further, PNG(NE) was less focused on the AMI abilities of two-way communication and gathering supplementary operational data as these abilities offer only incremental non-financial benefits and can only be realized at a significant incremental cost. In consideration of the points noted, PNG(NE) has proposed the implementation of an AMR solution rather than an AMI solution.

PNG(NE) obtained proposals from two vendors for the AMR Project, Itron and KTI Limited. Net present value (NPV) analyses were prepared on the proposals factoring in capital costs and operating cost projections provided by the respective vendors. The Itron proposal was determined to generate cost of service and customer benefits that were greater than for the KTI proposal. A further qualitative factor supporting the recommendation to proceed with Itron is that PNG(NE) presently makes use of Itron technology and to change to another vendor's technology would have additional switching costs.

Based on PNG(NE)'s analysis, existing customers will benefit from the implementation of the AMR Project, with the benefits to be realized primarily in the form of the positive rate impacts arising from a net reduction in operating costs. Quantitative factors supporting PNG(NE)'s proposal to proceed with Itron AMR infrastructure include:

- With a capital cost of $4.1 million, the Itron AMR solution is the lowest-cost alternative;
- Over a 20-year analysis period, the AMR Project will provide net operating and maintenance cost savings with a NPV of approximately $2.2 million;

- Once fully implemented, on a net basis, the AMR Project will provide significant operating and maintenance cost savings, averaging $657,000 per year; and

- Residential customers will realize annual cost savings of approximately $8 over the 20-year life of the project.

In addition to these financial aspects, the reduced number of meter reading staff and vehicles will reduce employee exposure hours to potentially hazardous conditions, both at customer premises and on the road. Further, the reduction in vehicles will contribute to a reduction in greenhouse gas emissions and the overall environmental impact of PNG(NE)'s meter reading activities. Lastly, AMR will allow for timely collection of customer usage data and will eliminate the risk of bill errors resulting from manual entry errors, both factors are expected to contribute to an improvement in customer satisfaction.

Based on the foregoing and the evidence presented in this Application, PNG(NE) submits that the proposed implementation of AMR infrastructure as a replacement for the present manual meter reading process is in the public interest. PNG(NE) respectfully requests that the BCUC approve the Application as presented.

1 Application Overview

This purpose of this application (Application) by Pacific Northern Gas (N.E.) Ltd. (PNG(NE)) is to request British Columbia Utilities Commission (BCUC) approval, pursuant to sections 45 and 46 of the *Utilities Commission Act* (UCA), of a Certificate of Public Convenience and Necessity (CPCN) for capital expenditures of approximately $4.1 million to update and replace the current manual meter reading process for residential and commercial customers with automated meter reading (AMR) remote-read infrastructure in the northeastern British Columbia communities it serves, including Fort St. John (FSJ), Dawson Creek (DC) and Tumbler Ridge (TR) (AMR Project).

1.1 Applicant

PNG(NE) owns and operates a natural gas distribution system and provides natural gas service to over 21,000 residential, commercial and industrial customers in the British Columbia municipalities of Fort St. John, Dawson Creek and Tumbler Ridge, as well as in the rural areas of Doe River, Pouce Coupe, Rolla, Tomslake, Taylor and Pink Mountain. PNG(NE) has its main operating offices at 1208 – 102nd Avenue, Dawson Creek, British Columbia and at 10016 – 104 Street, Fort St. John, British Columbia.

PNG(NE) is a subsidiary of Pacific Northern Gas Ltd. (PNG), which provides natural gas transmission, distribution and sales services to more than 20,000 residential, commercial and industrial customers located in communities in northwestern British Columbia. PNG maintains an operating office at 2900 Kerr Street in Terrace, British Columbia, and its head office is located at 2550, 1066 West Hastings Street, Vancouver, British Columbia.

PNG, in turn, is a wholly-owned subsidiary of AltaGas Canada Inc. (ACI). Until October 2018, PNG was a wholly-owned subsidiary of AltaGas Utility Holdings (Pacific) Inc., which in turn was wholly-owned by AltaGas Ltd. (AltaGas). In late-2018, a corporate reorganization was undertaken by AltaGas that saw AltaGas Utility Holdings (Pacific) Inc. renamed to ACI, the aggregation of AltaGas' Canadian utilities and renewables power infrastructure into ACI, and the establishment of ACI as a new standalone public company.

1.2 Financial and Technical Capability

1.2.1 Financial Capability

PNG(NE) is capable of financing the implementation and operation of the AMR Project either directly, or indirectly through its association with PNG and the ACI group of companies.

1.2.2 Technical Capability

PNG(NE) has the technical capacity to oversee the implementation and operation of the AMR Project. PNG(NE) has many years of experience in constructing, operating and maintaining natural gas transmission and distribution systems, including metering infrastructure, and in providing safe, secure and reliable gas service to its customers in northeastern British Columbia. Further, PNG(NE) has a strong relationship with Itron, the proposed vendor, and PNG(NE) will engage Itron, as required, as it finalizes planning and executes the AMR Project.

1.3 Application Contacts

All notices and other communications in connection with this Application should be directed to:

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Alternate contact:

Janet Kennedy, Vice President Regulatory Affairs & Gas Supply
Pacific Northern Gas Ltd.
Suite 2550, 1066 West Hastings Street
Vancouver, B.C., V6E 3X2

Telephone: (604) 691-5684
Fax: (604) 697-6210
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1.4 Regulatory Process

In this Application, PNG(NE) is seeking approval for $4.1 million in capital expenditures to update and replace the current manual meter reading process for residential and commercial customers with AMR infrastructure. PNG is hopeful that it will have BCUC approval no later than December 31, 2019, in order to accommodate the project schedule presented in Section 3.3.1 that anticipates procurement of materials in January 2020.

Under the BCUC's 2015 Certificate of Public Convenience and Necessity Application Guidelines (CPCN Guidelines), the BCUC has discretion as to whether or not hearings are held on an application. Should the BCUC consider it necessary to proceed with a hearing on this Application, PNG(NE) supports a written hearing process with one or two rounds of information requests. PNG(NE) is open to processes that may facilitate an expeditious and efficient review, including the possibility of a meeting or workshop to review the Application with BCUC staff.

1.5 Approval Sought

In this Application, PNG(NE) seeks approval, pursuant to sections 45 and 46 of the UCA, for a CPCN for capital expenditures of approximately $4.1 million to update and replace the current manual meter reading process for residential and commercial customers with AMR infrastructure.

PNG(NE) submits that the approval sought in this Application is in the public interest. PNG(NE) has demonstrated that AMR is a cost-effective meter reading solution that will enable more efficient and effective meter reads and will also provide a number of operational benefits. A draft Order detailing the approvals sought is attached as an Appendix.

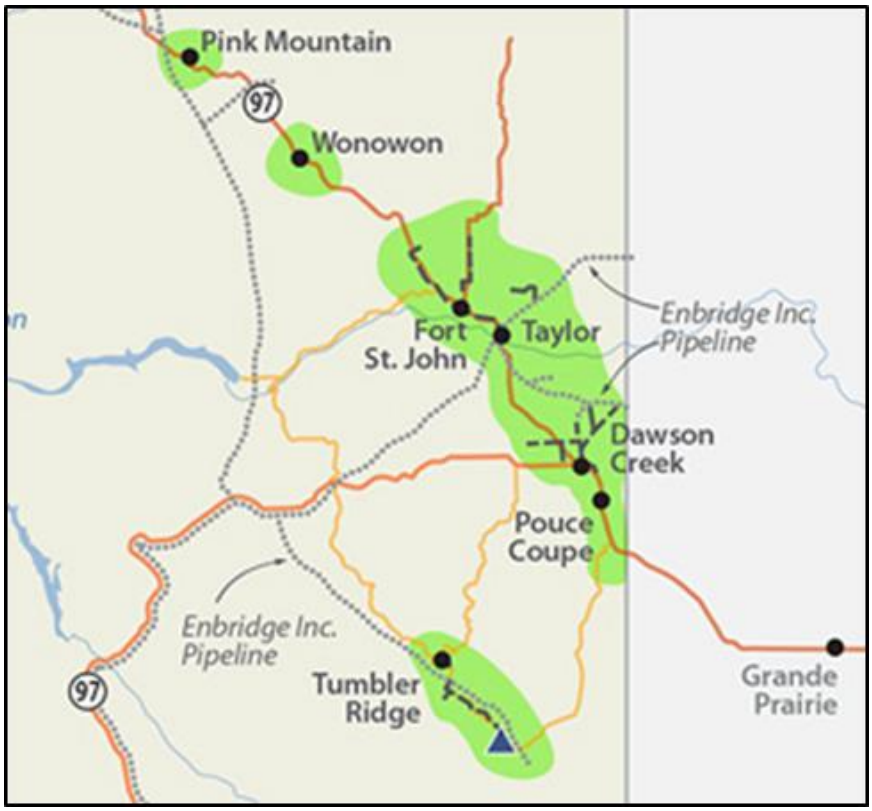
2 Project Need and Justification

2.1 Background

2.1.1 Service Areas

PNG(NE) has approximately 21,500 residential and commercial natural gas customers in the FSJ, DC and TR service areas. Exhibit 2-1 provides an illustration of the proximity of service areas (shown in green) to one another.

Exhibit 2-1 PNG(NE) Service Areas



2.1.2 Customer Base

Exhibit 2-2 provides the distribution of residential and commercial customers, by service area.

Exhibit 2-2 Distribution of Residential and Commercial Customers

Service Area	Residential	Commercial	Total
Fort St. John	11,027	1,758	12,785
Dawson Creek	6,344	928	7,272
Tumbler Ridge	1,143	106	1,249
Total	18,514	2,792	21,306

2.1.3 Existing Manual Meter Reading Processes

PNG(NE)'s current manual meter reading processes have been in place substantively unchanged since PNG(NE) commenced operations. Over 99% of PNG(NE) meters in the FSJ, DC, and TR service areas are manually read by a meter reader. Residential meters are read on a bi-monthly basis and commercial meters are read monthly. Meter reading is performed over a series of 8 cycles, with each cycle taking approximately 3 days.

PNG(NE)'s meter reading workforce is comprised of two area managers and five full-time equivalent (FTE) meter readers. In addition to other operational duties, area managers are responsible for the day-to-day supervision of the meter reading staff, including scheduling, resource management, and safety of the meter readers. Meter readers are responsible for performing on-site visits to customer premises to complete manual reads of the meter to obtain gas consumption data. The meter read is manually entered into a handheld device. At the end of each day meter read data batches are electronically transferred from the handheld device into the Field Collections System (FCS). The FCS performs validation processes to help identify anomalies and potential errors. Cleared batches are processed for billing in the Banner Billing System (BBS).

In addition to the regular meter reading cycles, manual meter reads are also required each time a customer requests a move in / move out from a premise or makes a special request for an actual read. Meter re-reads may also be required to verify or correct previous reads when an error has been identified.

2.2 Benefits of Automated Meter Reading

PNG(NE) is committed to making improvements that positively impact the safety, efficiency and reliability of its natural gas service. While PNG(NE)'s existing manual meter reading process has been reliable and has produced adequate results for customers, PNG(NE) has determined that the implementation of AMR technology is a prudent decision when the potential benefits are considered. PNG(NE) notes that AMR has been proven to be effective and has been in use by the utility industry for over two decades and is utilized by gas, electric and water utilities.

PNG(NE) submits that the AMR Project will address two key customer priorities: mitigating rate increases and customer satisfaction. The benefits for PNG(NE) and its customers that may be realized from the AMR Project are summarized as follows:

1) Improvements in workforce safety;

2) Timely and accurate meter readings;

3) Operational efficiencies;

4) Increased customer satisfaction;

5) Reduction in environmental impacts; and

6) Revenue protection opportunities.

Additional information on each of these key improvement areas is provided in the discussion that follows.

2.2.1 Workforce Protection

Employee safety is a top priority for PNG(NE). The main safety risks for meter readers are attributed to encounters with aggressive animals, unsafe terrain caused by uneven surfaces and undetermined ground conditions, debris, snow and ice conditions (overhead and on ground). A further challenge is accessing difficult to reach meters (i.e. locked gates and fences, geographic challenges, and limited access during bad weather). Due to these variable conditions, meter readers have reported medical and first aid injuries and close call incidents while trying to obtain meter readings on customer premises.

A primary benefit of AMR is the elimination of the need to enter customer premises, such as private yards or commercial facilities, which will significantly reduce the potential for injury to meter readers.

2.2.2 Timely and Accurate Meter Readings

Manual meter reading issues arise due to human input error, as well from missed reads due to inclement weather and meter inaccessibility. Inaccurate and missed reads require that PNG(NE) make use of estimated reads for billing purposes. Another advantage of AMR is that billing can be based on near real-time consumption rather than on estimates based on past or predicted consumption. This timely information coupled with analysis can help PNG(NE) with the evaluation and accounting for unaccounted for (UAF) gas gains and losses.

AMR will provide timely and accurate meter reads and more accurate customer billing and is expected to eliminate most customer requests for re-reads In addition, AMR is expected to improve analysis of UAF gains and losses.

2.2.3 Operational Efficiency

The current meter reading process at PNG(NE) is time intensive and costly. PNG(NE) currently employs five full-time meter readers to manually collect meter reads from 21,500 meter points throughout the northeast BC communities. Each of the meter readers requires a vehicle to travel their assigned route.

Implementation of AMR provides the opportunity for operating costs savings from a significant reduction in staffing for meter reading activities and the associated reduction in vehicle fleet dedicated to these activities.

2.2.4 Customer Satisfaction

Under existing meter reading processes, meter readers require access to individual meters sited on each customers premise. Many customers view this as an inconvenience as they prefer to keep their premises secure. Restricted access results in PNG(NE)'s meter readers frequently making use of estimated meter reads for billing purposes. Billing based on estimates provides limited insight into a customer's actual gas consumption and reduces customer confidence in the accuracy of the service provided by PNG(NE).

AMR will eliminate the need to access customer premises for meter reads. In addition, actual read data will be available to provide accurate consumption data to customers. These factors have the potential to increase customer satisfaction and reduce customer complaints.

2.2.5 Reduction in Environmental Impacts

The geography of PNG(NE)'s service areas has a number of characteristics – including low customer density, considerable variations in weather conditions, and a largely radial road network – that necessitate vehicle usage for meter reading activities. Although walking is employed where possible, a meter reader's primary means of travel between metered service points is by vehicle.

Implementing AMR technology will significantly reduce vehicle usage for meter reading tasks and will help reduce PNG(NE)'s GHG emissions and the environment impact of its operations.

2.2.6 Revenue Protection

As PNG(NE) does not have a formal gas theft detection program in place, meter tampering and gas theft are generally only discovered on an ad hoc basis. Most frequently, theft is identified by a drastic decrease in customer consumption, a chance sighting of illegal activity, or meter reader identification of signs of meter tampering.

The provision of timely and accurate meter reads will provide PNG(NE) with actual consumption data that can be analyzed for anomalies that may be indicative of gas theft. Further, AMR infrastructure has tamper technology built into it that records meter movement, which may be used to signal meter tampering, prompting further investigation.

2.3 Project Alternatives Considered

Nationally and internationally, utilities have been implementing advanced metering technologies. The technology has evolved over time and is available for water, gas and electric, as well as multi-commodity utilities. In its evaluation, PNG(NE) considered two alternatives to the status quo, the manual meter reading process described in Section 2.1, including:

1) Automated Meter Reading (AMR); and

2) Advanced Metering Infrastructure (AMI).

The discussion that follows provides additional information on each of these alternatives and also provides PNG(NE)'s non-financial and financial evaluation of the two alternatives.

2.3.1 Automated Meter Reading (AMR)

PNG(NE)'s proposed AMR Project is described in Section 3. As noted previously, AMR has been around for many years as a solution to improve the efficiency and accuracy of the meter reading process.

An AMR system consists of a meter endpoint equipped with an Encoder Receiver Transmitter (ERT) module. The ERT module is a measuring and encoding device with a built in radio transmitter that records consumption, encodes the information, and then transmits the

information via a radio frequency (RF) signal to a data collection receiver unit. AMR is a one-way communicating system that can typically collect and store meter data for a period of 40 days. Various levels of AMR technology exists – from basic handheld units to fixed networks with data collection infrastructure tied to power poles and repeater units.

The AMR infrastructure considered by PNG(NE) involves equipping existing meters with ERT modules that transmit meter read data via a RF signal to a vehicle-mounted radio transceiver. Exhibit 2-3 provides an illustration of the key elements required for implementation of the AMR solution proposed by PNG(NE).

Exhibit 2-3 Proposed Drive-by AMR Infrastructure

2.3.1.1 AMR Benefits

PNG(NE) has identified the primary benefit of implementing AMR technology to be the potential to lower operating costs and to improve productivity. From an efficiency perspective, the number of employees required to obtain meter readings can be reduced and the reduced number of staff and vehicles also lessens the exposure hours to potentially hazardous conditions, particularly in the winter months. A reduction in vehicles also contributes to a reduction in GHG emissions and overall environmental impacts of meter reading activities. Lastly, AMR allows for timely collection of customer usage data and the risk of bill errors resulting from manual entry errors will be eliminated, both factors contributing to improvements in customer satisfaction.

2.3.2 Advanced Metering Infrastructure

The second alternative considered in PNG(NE)'s evaluation was advanced metering infrastructure (AMI), a meter reading solution that has capabilities beyond gathering meter read data. AMI is a collection of endpoint, software, and communications network systems that enable two-way communication (ability to transmit and receive information) between a customer premise and the utility. The two-way communication abilities have resulted in AMI sometimes being referred to as "smart meter" technology.

An AMI network is comprised of the following components:

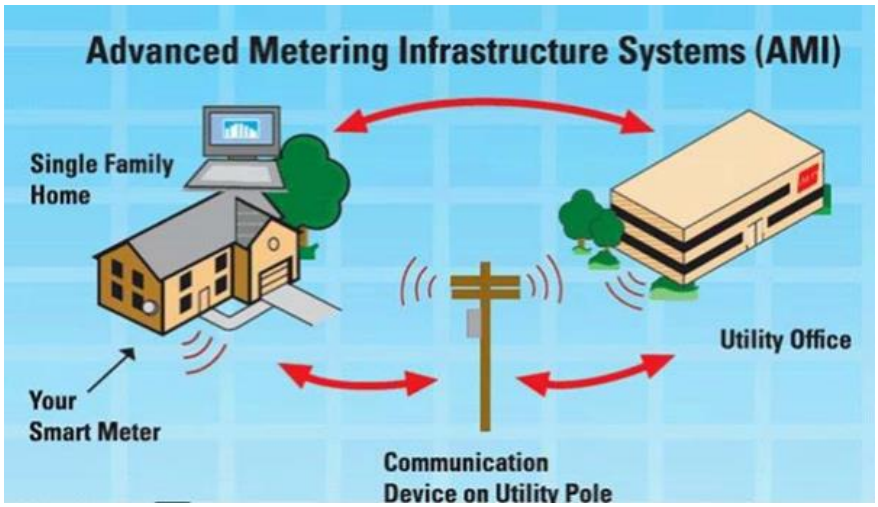
- An AMI meter endpoint installed at the customer's premise;

- A collector, which is a field-based communication unit that wirelessly collects and relays information between a series of endpoints and ultimately to and from the utility office using RF technology; and

- A fixed network, which consists of power cables, antennas, poles, and routers. The fixed network provides a medium for meter data to reach the collector and for the utility commands to reach the AMI meter.

Similar to AMR technology, the AMI endpoint would record gas consumption data and transmit it in near real time via a connector to the utility office using RF technology. Exhibit 2-4 provides an illustration of how these components interact with one another.

Exhibit 2-4 Advanced Metering Infrastructure (AMI)



2.3.2.1 Implementation of AMI by Utilities

While there are AMI offerings for natural gas and water systems, market development for AMI has been focused on electricity systems. This focus has been driven by advances in electricity monitoring and the development of the “smart grid” network to allow for better management of existing electrical systems. AMI for electricity systems has been widely supported and encouraged by governmental energy policies as AMI is viewed as a means of addressing electricity capacity and supply constraints forecast for the future.

Another factor favouring electricity systems over natural gas and water utilities is that an AMI network requires above-ground infrastructure. Gas and water utilities would have to ether develop agreements with other utility companies with existing towers or build their own network infrastructure which may come at considerable cost.

Based on the foregoing, gas utilities have generally chosen to invest in AMR with a focus on the benefit of automating the meter reading process, rather than AMI. Where gas utilities have implemented AMI, they have generally done so where they are part of a corporate entity that provides both electric and natural gas service and where AMI infrastructure has been implemented concurrently for both areas of the business. PNG(NE) notes that at this time, no Canadian Gas Association member natural gas utility has implemented AMI.

2.3.2.2 AMI Benefits

The implementation of AMI technology would provide all of the benefits that AMR technology provides that would lead to lower operating costs and improved productivity, including: labour and vehicle cost reduction; reduced exposure to hazardous conditions; reduced GHG reductions; and the potential to increase customer satisfaction. However, PNG(NE) notes that due to the cost of additional infrastructure required the net cost savings for AMI are not as significant as with AMR.

An AMI endpoint may also have the ability to record a variety of other physical data (i.e. pressure, flowrate, temperature, corrosion data and methane detection) and the ability to virtually and remotely shut off the gas supply, offering the potential for further operational efficiencies for system safety and integrity. PNG(NE) notes that the configuration of its gas distribution networks/systems is such that there is reduced potential for benefits to be realized from virtual/remote shut-off capability. PNG(NE)'s systems are relatively small with taps from upstream gas suppliers and, as such, line pack is not significant. Further, PNG(NE)'s systems do not serve large urban centres where the supply/demand balance can be managed through load shedding in the event of an upstream upset.

A second key advantage of AMI referred to previously is the ability to provide real time consumption data. Real time data has many benefits, including the ability to provide customers with greater details on their consumption and the potential to allow for flexible billing dates. A further advantage of AMI is that the utility has the ability to interact and communicate with the AMI endpoint remotely or virtually by sending commands to the endpoint from the utility's operations center.

2.3.3 Capital Cost Estimates of Alternatives

2.3.3.1 AMR and AMI Product Vendors

The products of two industry leaders in the field of meter reading technologies were considered for PNG(NE)'s evaluation: Itron and Sensus. Both entities offer AMR and AMI solutions for the natural gas market, with the respective technologies of each having comparable functionality. In Canada, Itron Canada Inc. (Itron) supports its own product, while KTI Limited (KTI) supports the Sensus product line.

Itron is a global company offering innovative and secure utility service solutions. PNG and PNG(NE) have had a successful working relationship with Itron for over 10 years, making use of Itron's meter reading hardware and software. With this history, interfaces are presently in place between the Itron metering assets and PNG(NE)'s billing system, the BBS.

KTI is a Canadian company specializing in the distribution of high quality and energy efficient products for gas, water, and electric utilities, including the Sensus FlexNet product line. Of note, KTI has supported the City of Medicine Hat in Alberta implement the FlexNet AMI solution for all of the municipality's residential and commercial gas, water and electric accounts.

2.3.3.2 Cost Estimates

PNG(NE) obtained cost estimates for each of the AMR and AMI solutions offered by each of the vendors, with the Itron estimate coming direct from Itron and the estimate for the Sensus FlexNet product coming from KTI. Parameters specified in PNG(NE)'s request for vendor proposals for upgrading 22,887 services (active and inventoried meters) included the capital

cost of metering, collection and support systems to allow for automated meter reading, the cost of installation, and the cost of project management.

Exhibit 2-5 provides a summary of the cost estimates. PNG(NE) notes that the cost estimates were subject to a 10% provision for overheads and a 15% provision for contingency.

Exhibit 2-5 Capital Cost Estimates (including implementation)

Across All Areas	AMR		AMI	
	Itron	KTI Limited	Itron	KTI Limited
Capital Cost Estimate	$4,127,000	$5,419,000	$11,469,000	$7,285,000

2.3.4 Assessment of Alternatives

As per Exhibit 2-5, the capital cost for implementation of an AMI solution, at an estimated cost of $7.3 to $11.5 million, is considerably greater than the cost of implementing an AMR solution, at an estimated cost of $4.1 to $5.4 million. The variance in the AMR and AMI cost estimates aligns with PNG(NE)'s expectations. The higher cost for AMI is primarily due to the requirement for high-cost, new intelligent meters capable of two-way communication, and to the requirement to establish a communications network. PNG(NE) notes that in order to take advantage of AMI's potential benefit of gathering and reporting on supplemental operational data, additional sensors would have to be purchased and installed, all at an added cost.

PNG(NE)'s primary objectives for giving consideration to the automation of the meter reading function were detailed in Section 2.2, and included achieving operational efficiencies and improving employee safety, while improving customer satisfaction. PNG(NE) was less focused on the AMI abilities of two-way communication and gathering supplementary operational data as these abilities offer only incremental non-financial benefits and can only be realized at a significant incremental cost. In consideration of the points noted, PNG(NE) has proposed the implementation of an AMR solution rather than an AMI solution.

PNG(NE) prepared a NPV analysis of both the Itron and KTI AMR proposals, factoring in the capital costs presented in Exhibit 2-5 and operating cost projections provided by the respective vendors. Exhibit 2-6 provides a summary of the NPV analysis and evaluation of residential customer rate impacts. As can be seen, the Itron proposal produces cost of service and customer benefits that are greater than the KTI proposal.

Exhibit 2-6 Vendor Proposal – Summary of Cost and Rate Impacts

20 Year Evaluation Period – All Service Areas	AMR Itron	AMR KTI
Cost Impacts		
Capital Cost	$4,126,740	$5,419,334
Average Annual Incremental Costs	$375,911	$493,860
Average Annual Cost Savings	$(657,414)	$(636,985)
Average Annual Impact on Costs	$(281,503)	$(143,125)
Average Rate Impacts		
Incremental cost of service (per GJ)	$(0.08)	$(0.04)
Residential usage/year (GJ)	100.6	100.6
Impact to annual residential bill	$(7.71)	$(3.92)
Net Present Value of Customer Benefits	$2,188,814	$775,078

A further qualitative factor supporting the recommendation to proceed with Itron is that, as noted previously, while both products have similar functionality PNG(NE) presently makes use of Itron technology and to change to another vendor's technology would have additional switching costs.

Based on the foregoing, PNG(NE) has proposed proceeding with implementation of Itron AMR infrastructure.

2.4 Project Justification and Benefits

PNG(NE) has concluded that proceeding with the Itron AMR alternative for the proposed AMR Project is a cost-effective approach to achieve operational efficiencies, to improve the safety of its workforce, and to improve customer satisfaction. PNG(NE)'s existing customers will benefit from the implementation of the AMR Project, with the benefits to be realized primarily in the form of the positive rate impacts arising from a net reduction in operating costs. Quantitative factors supporting PNG(NE)'s proposal include:

- With a capital cost of $4.1 million, the Itron AMR solution is the lowest-cost alternative;
- Over a 20-year analysis period, the AMR Project will provide net cost savings with a NPV of approximately $2.2 million;
- Once fully implemented, on a net basis, the AMR Project will provide significant operating cost savings, averaging $657,000 per year; and
- Residential customers will realize annual cost savings of approximately $8 over the 20-year life of project.

The sections that follow provide supporting analyses that illustrate these financial benefits.

2.4.1 Revenue Requirement Impact

The implementation of the AMR Project will provide financial benefits to customers in the PNG(NE) service areas in the form of the positive rate impacts arising from a reduction in the net cost of service compared to the status quo.

PNG(NE) has undertaken a NPV analysis of the net reduction in the cost of service anticipated to be realized from implementing AMR. The cost of service forecast incorporated into the NPV analysis reflects a net reduction in operating and maintenance costs offset in part by incremental ratebase items. Exhibit 2-7 illustrates that a net cost of service reduction with a NPV of $2.2 million is anticipated over the 20-year analysis period.

Exhibit 2-7 NPV of Net Cost of Service Reduction

Cost of Service Impact over 20 years

Cost of Service		
Rate Base Items		$ 7,894,129
O&M Cost Savings		(13,805,689)
Net Cost Reductions		**$ (5,911,560)**
Net Present Value	7.76%	
Cost of Service		2,188,814
Net Cost Reductions		**$ 2,188,814**

The analysis supporting the financial summary provided in Exhibit 2-5 is provided as Exhibit 2-7a on the page that follows.

Exhibit 2-7a – Analysis to Support NPV of Cost of Service Reductions Over 20 Years

ITRON AMR

AMR Project - FSJ/DC/TR	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Cost of Service	FSJ/DC/TR																				
Depreciation of utility plant	-	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337	206,337
Tax on depreciation	-	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316	76,316
Interest on utility plant	52,142	101,676	96,462	91,248	86,034	80,820	75,606	70,391	65,177	59,963	54,749	49,535	44,321	39,106	33,892	28,678	23,464	18,250	13,035	7,821	2,607
Return on equity on utility plant	79,013	153,825	145,937	138,048	130,160	122,272	114,383	106,495	98,606	90,718	82,829	74,941	67,052	59,164	51,275	43,387	35,498	27,610	19,721	11,833	3,944
Tax on return on equity	29,224	56,894	53,977	51,059	48,141	45,224	42,306	39,388	36,471	33,553	30,635	27,718	24,800	21,882	18,965	16,047	13,129	10,212	7,294	4,376	1,459
CCA Tax Reduction	(137,370)	(83,338)	(78,337)	(73,637)	(69,219)	(65,066)	(61,162)	(57,492)	(54,043)	(50,800)	(47,752)	(44,887)	(42,194)	(39,662)	(37,282)	(35,045)	(32,943)	(30,966)	(29,108)	(27,362)	(25,720)
Tax in Lieu at 0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Ratebase Items	23,009	511,712	500,692	489,372	477,770	465,903	453,786	441,436	428,865	416,087	403,115	389,960	376,633	363,144	349,503	335,720	321,802	307,758	293,596	279,322	264,944
Operating Costs (Savings)																					
Salaries (Fully Loaded)	(98,615)	(100,587)	(102,599)	(104,651)	(106,744)	(108,879)	(111,056)	(113,278)	(115,543)	(117,854)	(120,211)	(122,615)	(125,068)	(127,569)	(130,120)	(132,723)	(135,377)	(138,085)	(140,846)	(143,663)	(146,537)
FTEs	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.000	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Proportion of Year	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75
Salary expenses	**-**	**(502,936)**	**(512,995)**	**(523,255)**	**(533,720)**	**(544,394)**	**(555,282)**	**(566,388)**	**(577,716)**	**(589,270)**	**(601,055)**	**(613,076)**	**(625,338)**	**(637,845)**	**(650,602)**	**(663,614)**	**(676,886)**	**(690,424)**	**(704,232)**	**(718,317)**	**(549,512)**
Severence costs (2 weeks per year x 5 year average x 5 FTEs)	58,249																				
Truck Capital Costs	(58,366)	(59,534)	(60,724)	(61,939)	(63,178)	(64,441)	(65,730)	(67,045)	(68,386)	(69,753)	(71,148)	(72,571)	(74,023)	(75,503)	(77,013)	(78,554)	(80,125)	(81,727)	(83,362)	(85,029)	(86,729)
Useful Life	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Capital cost per year	(8,338)	(8,505)	(8,675)	(8,848)	(9,025)	(9,206)	(9,390)	(9,578)	(9,769)	(9,965)	(10,164)	(10,367)	(10,575)	(10,786)	(11,002)	(11,222)	(11,446)	(11,675)	(11,909)	(12,147)	(12,390)
Fuel Costs	(6,367)	(6,495)	(6,624)	(6,757)	(6,892)	(7,030)	(7,171)	(7,314)	(7,460)	(7,609)	(7,762)	(7,917)	(8,075)	(8,237)	(8,401)	(8,569)	(8,741)	(8,916)	(9,094)	(9,276)	(9,461)
Maintenance costs	(4,245)	(4,330)	(4,416)	(4,505)	(4,595)	(4,687)	(4,780)	(4,876)	(4,973)	(5,073)	(5,174)	(5,278)	(5,383)	(5,491)	(5,601)	(5,713)	(5,827)	(5,944)	(6,063)	(6,184)	(6,308)
Number of Trucks	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Proportion of year	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75
Fuel, maintenance of 1 truck 40% of the time	-	4,330	4,416	4,505	4,595	4,687	4,780	4,876	4,973	5,073	5,174	5,278	5,383	5,491	5,601	5,713	5,827	5,944	6,063	6,184	4,731
Truck costs	**-**	**(92,316)**	**(94,162)**	**(96,046)**	**(97,966)**	**(99,926)**	**(101,924)**	**(103,963)**	**(106,042)**	**(108,163)**	**(110,326)**	**(112,533)**	**(114,783)**	**(117,079)**	**(119,421)**	**(121,809)**	**(124,245)**	**(126,730)**	**(129,265)**	**(131,850)**	**(100,865)**
Elimination of Maintaining existing handheld units	-	(3,582)	(3,654)	(3,727)	(3,801)	(3,877)	(3,955)	(4,034)	(4,114)	(4,197)	(4,281)	(4,366)	(4,454)	(4,543)	(4,634)	(4,726)	(4,821)	(4,917)	(5,016)	(5,116)	(5,218)
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meter failure replacement	643	2,625	2,677	5,462	5,571	8,524	8,694	11,824	12,060	15,377	15,685	19,198	19,582	23,303	23,769	27,707	28,262	32,430	33,079	33,740	34,415
New handheld unit maintenance costs	2,995	12,222	10,257	3,702	3,776	3,851	3,928	4,007	4,087	4,169	4,252	4,337	4,424	4,512	4,603	4,695	4,789	4,884	4,982	5,082	5,183
Operating Costs (Savings)	61,888	(583,988)	(597,877)	(613,863)	(626,141)	(635,822)	(648,539)	(658,554)	(671,725)	(682,084)	(695,725)	(706,440)	(720,569)	(731,651)	(746,284)	(757,747)	(772,902)	(784,756)	(800,452)	(816,461)	(615,997)
INCREMENTAL COST OF SERVICE	**84,897**	**(72,276)**	**(97,185)**	**(124,491)**	**(148,371)**	**(169,920)**	**(194,752)**	**(217,118)**	**(242,860)**	**(265,997)**	**(292,611)**	**(316,481)**	**(343,937)**	**(368,508)**	**(396,781)**	**(422,027)**	**(451,099)**	**(476,998)**	**(506,855)**	**(537,138)**	**(351,054)**
Residential & Commercial volume (GJs) as per 2019 Rate Filing	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018	3,675,018
Incremental cost of service/GJ	0.02	(0.02)	(0.03)	(0.03)	(0.04)	(0.05)	(0.05)	(0.06)	(0.07)	(0.07)	(0.08)	(0.09)	(0.09)	(0.10)	(0.11)	(0.11)	(0.12)	(0.13)	(0.14)	(0.15)	(0.10)
Residential usage/year (GJ)	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101
Impact to annual residential bill	2.33	(1.98)	(2.66)	(3.41)	(4.06)	(4.65)	(5.33)	(5.95)	(6.65)	(7.28)	(8.01)	(8.67)	(9.42)	(10.09)	(10.87)	(11.56)	(12.35)	(13.06)	(13.88)	(14.71)	(9.61)
Utility Plant																					
Balance (bop)	**0**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**
Utility Additions - AMR	4,126,740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balance (eop)	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**
Net Plant in Service	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**	**4,126,740**
Add: Acc. Depreciation	0	(206,337)	(412,674)	(619,011)	(825,348)	(1,031,685)	(1,238,022)	(1,444,359)	(1,650,696)	(1,857,033)	(2,063,370)	(2,269,707)	(2,476,044)	(2,682,381)	(2,888,718)	(3,095,055)	(3,301,392)	(3,507,729)	(3,714,066)	(3,920,403)	(4,126,740)
Average Plant in Service	2,063,370	4,023,571	3,817,234	3,610,897	3,404,560	3,198,223	2,991,886	2,785,549	2,579,212	2,372,875	2,166,538	1,960,201	1,753,864	1,547,527	1,341,190	1,134,853	928,516	722,179	515,842	309,505	103,168
Data:																					
Inflation	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Depreciation Rate	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%
Marginal Tax Rate	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
Return on ST Debt	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%	4.74%
Return on LT Debt	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%	4.26%
Return on Equity	9.27%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%	9.25%
Proportion of ST Debt	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%	5.40%
Proportion of LT Debt	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%	53.27%
Proportion of Common Equity	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%	41.33%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Beginning Balance	0	3,755,333	3,530,013	3,318,212	3,119,120	2,931,973	2,756,054	2,590,691	2,435,249	2,289,135	2,151,786	2,022,679	1,901,319	1,787,239	1,680,005	1,579,205	1,484,452	1,395,385	1,311,662	1,232,962	1,158,985
Additions	4,126,740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCA rate (Class 51)	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
CCA	(371,407)	(225,320)	(211,801)	(199,093)	(187,147)	(175,918)	(165,363)	(155,441)	(146,115)	(137,348)	(129,107)	(121,361)	(114,079)	(107,234)	(100,800)	(94,752)	(89,067)	(83,723)	(78,700)	(73,978)	(69,539)
Ending Balance	3,755,333	3,530,013	3,318,212	3,119,120	2,931,973	2,756,054	2,590,691	2,435,249	2,289,135	2,151,786	2,022,679	1,901,319	1,787,239	1,680,005	1,579,205	1,484,452	1,395,385	1,311,662	1,232,962	1,158,985	1,089,446
Pre-tax WACC	7.773%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%	7.764%
Discount Factor	1.07773	1.16140	1.25158	1.34875	1.45347	1.56632	1.68793	1.81898	1.96021	2.11241	2.27642	2.45316	2.64363	2.84888	3.07008	3.30844	3.56531	3.84213	4.14044	4.46191	4.80834
Discounted Savings to Customers	**(78,774)**	**62,231**	**77,650**	**92,301**	**102,080**	**108,483**	**115,379**	**119,362**	**123,895**	**125,921**	**128,540**	**129,009**	**130,100**	**129,352**	**129,242**	**127,561**	**126,524**	**124,149**	**122,416**	**120,383**	**73,009**
20 Year NPV of Savings	**2,188,814**																				

2.4.2 Customer Rate Impacts

As described previously, PNG(NE) anticipates that the AMR Project will deliver benefits to customers in the form of positive rate impacts. Exhibit 2-8 that follows provides an alternate view of the cost of service impacts anticipated from the AMR Project, by service area.

Exhibit 2-8 also illustrates the anticipated average rate impacts for residential customers from the cost of service reduction. As presented, FSJ and DC residential customers are expected to see a delivery rate reduction of $0.08/GJ from the cost reductions, which is equivalent to an annual bill reduction of approximately $8. For TR residential customers, a delivery rate reduction of $0.02/GJ is anticipated, which is equivalent to an annual bill reduction of approximately $1.50.

Exhibit 2-8 Summary of Cost and Rate Impacts

20 Year Evaluation Period	Consolidated	FSJ/DC	TR
Cost Impacts			
Capital Cost	$ 4,126,740	$ 3,878,470	$ 248,270
Average Annual Incremental Costs	$ 375,911	$ 352,773	$ 23,141
Average Annual Cost Savings	$ (657,414)	$ (631,509)	$ (25,904)
Average Annual Impact on Costs	$ (281,503)	$ (278,735)	$ (2,763)
Average Rate Impacts			
Incremental cost of service (per GJ)	$ (0.08)	$ (0.08)	$ (0.02)
Residential usage/year (GJ)	100.6	101.6	70.3
Impact to annual residential bill	$ (7.71)	$ (7.99)	$ (1.48)

2.4.3 Analysis Assumptions

PNG(NE)'s analysis of the cost of service and rate impacts of undertaking the AMR Project include the following assumptions:

Ratebase Items

- Ratebase items included in the cost of service forecast reflect items that are impacted by the AMR Project incremental capital expenditures, net of avoided capital costs for 5 vehicles historically required for manual meter reading.
- Cost of service ratebase items are estimated to be approximately $376,000 annually over the 20-year analysis period and include provisions for depreciation, taxes, capital cost allowance, interest, and return on equity.

Operating and Maintenance Costs

- On a net basis, PNG(NE) estimates that, commencing in 2021, overall operating and maintenance costs, on average, will be reduced by approximately $657,000 annually over the 20-year analysis period.
- Incremental operating costs are expected to nominal; an average annual provision of $22,350 has been made for costs related to meter failure replacements and maintenance costs for the mobile collection system.
- PNG(NE) anticipates significant operating cost reductions due to avoided labour

and vehicle operating costs with the elimination of five meter reading positions and the five vehicle units dedicated to meter reading.

Other Parameters

- The AMR infrastructure assets are depreciated over a period of 20-years, their estimated useful life, which is also consistent with the provision for depreciating meters.
- While meters have an estimated positive salvage value of 1%, no provision has been made for net salvage for the ERTs and mobile collection assets. PNG(NE) considers this to be a conservative approach and appropriate given that the salvage value in meters is attributed to the metal content; this does not apply to the ERTs or the mobile collection assets.
- The discount rate used in the NPV analysis is based on the PNG(NE) service area's pre-tax weighted average cost of capital (WACC) as approved for 2019 per the BCUC decision on the PNG(NE) 2018-2019 Revenue Requirements Applications.

2.4.4 Non-Financial Qualitative Benefits

PNG(NE) provided an overview of anticipated benefits of AMR technology in Section 2.2. In addition to operational efficiencies and cost savings described above, the summary included a discussion of qualitative benefits to be realized. The discussion that follows reiterates the qualitative benefits anticipated to be realized from the AMR Project.

2.4.4.1 Improvements in Workforce Safety

AMR will eliminate the need for meter reading employees to enter customer premises, such as private yards or commercial facilities, which will significantly reduce the potential for injury to meter readers. Further, employee time operating vehicles will be considerably reduced.

Every year, meter readers have reported medical and first aid injuries and close call incidents while trying to obtain meter readings on customer premises. Further, each meter reader logs approximately 13,000 km per year in their vehicle, further exposing the employees to the risks of driving.

2.4.4.2 Timely and Accurate Meter Readings

AMR will provide timely and accurate meter reads and more accurate customer billing and is expected to eliminate most customer requests for re-reads.

PNG(NE) estimates that approximately 500 reads are missed each summer month and estimates that this figure increases to approximately 3,000 missed reads during each winter month. Estimated bills are a frequent source of customer dissatisfaction and are often followed by a customer request for an actual read which frequently result in billing adjustments via a cancel/rebill. PNG(NE) had 1,000 cancel/rebill service orders in 2017 and 1,500 in 2018. With AMR, PNG(NE) expects to see a reduction in cancel/rebill service orders.

In addition, the timely consumption data provided by AMR will replace the consumption estimates historically made use of by PNG(NE) in its evaluation and accounting for UAF

gains and losses. Reduced reliance on estimates is expected to improve the analysis of UAF gains and losses.

2.4.4.3 Increased Customer Satisfaction

AMR will eliminate the need to access customer premises for meter reads. In addition, actual read data will be available to provide accurate consumption data to customers. These factors have the potential to increase customer satisfaction and reduce customer complaints.

2.4.4.4 Reduction in Environmental Impacts

Implementing AMR technology will significantly reduce vehicle usage for meter reading tasks and will help reduce PNG(NE)'s GHG emissions and the environment impact of its operations.

PNG(NE) has estimated that each meter reader drives their gasoline-fueled pickup truck approximately 13,000 kilometers per year, contributing an estimated 4 tonnes of CO^2 equivalent greenhouse gas (GHG) emissions per year. On a collective basis, the elimination of five positions and five vehicles has the potential to reduce PNG(NE)'s GHG emissions by 20 tonnes of CO^2.

2.4.4.5 Revenue Protection Opportunities

The provision of timely and accurate meter reads will provide PNG(NE) with actual consumption data that can be analyzed for anomalies that may be indicative of gas theft. Also, tamper technology built into AMR infrastructure records meter movement and may be used to signal meter tampering and gas theft.

2.5 Project Risk and Mitigation Strategies

AMR technology has proven to be very reliable and widely accepted as evidenced by the many installations across utilities in Canada and throughout the United States and Europe. Despite this fact, PNG(NE) is cognizant that any complex project carries potential risk. PNG(NE) has identified the following risks and has provided its mitigation plans in Exhibit 2-9 below.

Exhibit 2-9 Overview of Risks and Mitigation Strategies

Key Risk		Control / Mitigation
1	Project Management	Upon BCUC approval, a Project Execution Plan will be finalized, outlining budget, schedule, and scope baselines, resource requirements, breakdown of deliverables, acceptance criteria and quality control requirements. PNG has experienced personnel and contractors, including recent experience with a pilot project in PNG-West.
2	Communication	The Communication and Stakeholder Management Plan will be finalized as part of Project Execution Plan and will ensure regular collaborative communications are provided to all internal and external stakeholders throughout the duration of the project.

Key Risk		Control / Mitigation
3	Installation Schedule and Sequence	Field installation of ERTs will start in Spring 2020 when site conditions are favorable. ERT installation route sequencing will be included as part of project planning. Route sequencing will be reviewed and accepted by PNG(NE) prior to installation.
4	Resource Requirements	PNG internal resources who have skills and experience in AMR technology will be utilized during project execution and will train new resources on the procedures in place.
5	Foreign Exchange	$0.05 reduction in C$ vs US$ = $~7k reduction in project NPV. 15% contingency is included in financial analysis.
6	Failure Rate of Modules	Financial analysis modelled an average 0.5% annual failure rate although Itron claims failure rate is much lower. Average 0.5% annual increase in failure rate leads to ~$100k reduction to project NPV.
7	Resource Calendar	Financial analysis modelled labour headcount reductions to occur 3 months after project fully implemented. 6-month delay in headcount reduction leads to ~$200k reduction to project NPV. PNG(NE)'s project management approach will reduce this risk.
8	Resource and Material Requirements – Labour and Truck	Financial analysis assumes elimination of 5 FTE and 5 trucks. Existing non-meter reading FTE with existing truck will assume the responsibility of meter reading after AMR implementation. The need for one additional FT employee and truck = ~$1.3M reduction to customer savings NPV.
10	Data Transfer	PNG resources are trained and experienced to validate that all ERTs data is properly transferred the BBS. Quality control procedures will be developed to ensure ERT serial numbers are entered into / properly synchronized with the BBS.
11	Material Cost Certainty / Delivery Timeline	The structure of the contract that PNG(NE) has negotiated with Itron provides cost certainty on major project elements. Agreement in place with vendor to hold agreed price quote until end of Q1 2020.
12	Meters for Recall	Meters for recall will be replaced prior to installing ERTs. Project schedule will include the timing of meter replacement for meters due for recalls. A post-deployment plan will be developed to recall meters and attach the ERT post implementation.
13	Quality Control	Develop a Project Control Manual with input from core project team that outlines the acceptance criteria of each deliverable.
14	Concurrent Projects	Incorporate in project planning the risk and impact of other concurrent projects on the resource, schedule, and scope of the AMR Project.

PNG(NE) has also prepared a ranking of the risks identified in Exhibit 2-9 and created a 5x5-risk matrix of likelihood and cost impact that is presented as Exhibit 2-10 that follows. The ordinal associated with each risk identified in Exhibit 2-9 has been presented in the matrix to illustrate PNG(NE)'s assessment of the risk. PNG(NE) will continue to focus resources on the risks that rank higher on the likelihood and cost impact scales to ensure that mitigation efforts continue to provide a reasonable balance between cost and risk.

Exhibit 2-10 Risk Ranking Matrix

Likelihood						
High						
Moderate			9, 14	6, 7	4, 11, 12	3, 8
		5, 10	4, 13	2		
Low					1	
		Low		Moderate		High
				Cost Impact		

2.6 Long-term Resource Planning Considerations

PNG(NE)'s last long-term resource plan was filed with the BCUC in April 2015 and was approved under BCUC Order G-155-15 (2015 Resource Plan). As the AMR Project was not anticipated at that time there was no consideration given to the AMR Project in the 2015 Resource Plan.

Appendix A to the 2015 Resource Plan presented a summary of resource plan objectives to be applied to the evaluation of alternative resource options. PNG(NE) has presented information on alternatives considered in Section 2.3 of this Application. As the alternatives are differing technologies but of a similar nature, such an evaluation is not considered meaningful for this Application. However, to aid in the evaluation of PNG(NE)'s proposal, PNG(NE) provides the following overview of aspects of the AMR Project as they pertain to the resource plan objectives identified in the 2015 Resource Plan.

2.6.1 Safe, Reliable Service

PNG(NE) considers the provision of safe, reliable service an important guiding principle in its decision-making processes, and that this must be balanced with other resource planning objectives such as the provision of service at least cost, the economic viability of the utility, and rate stability.

PNG(NE) considers the implementation of the AMR Project to be relatively low-risk and to present no risk to PNG(NE)'s ability to continue to provide safe and reliable service to its customers.

2.6.2 Least Cost Service

Resource options available to PNG(NE) must consider rate impacts on customers and the ability of customers to pay for capacity additions necessary to meet the objective of safe, reliable service, compared to the price of alternate energy sources available to them.

In evaluating the proposed AMR Project, PNG(NE) has considered potential rate impacts from incremental capital and operating expenditures. As noted previously, the incremental capital and operating costs of the AMR Project will be more than offset by anticipated operating cost savings which will provide benefits to customers in the form of lower rates.

2.6.3 Economic Viability of Utility

PNG's shareholder and customers require that PNG remain a viable operation that continues to provide natural gas service as an attractive alternative to electricity, propane,

wood and oil. In order to maintain its position among energy providers, it is critical that PNG(NE) be able to meet its financial obligations while being provided an opportunity to earn its allowed return, and that customers are able to continue purchasing natural gas at competitive prices compared to alternate energy sources.

PNG(NE)'s planned capital investment in the AMR Project is supported by the favourable results of the conservative NPV analyses which indicate that all capital and operating costs will be more than offset by operating cost savings and that the planned investment in the AMR Project is prudent.

2.6.4 Stable Rates

Customers prefer stable rates over time, allowing them to budget with some predictability as well as validating their choice of natural gas for their thermal applications. Volatility in rates leads to customer dissatisfaction and may introduce changes to customer usage characteristics. Significant capital expenditures may result in upward pressure on delivery rates.

Once again, PNG(NE) notes that its planned capital investment in the AMR Project is supported by the results of the conservative NPV analyses which indicate that all capital and operating project costs will be more than offset by operating cost savings, and that the AMR Project will provide positive rate impacts for existing customers over the 20-year planning horizon.

2.6.5 Environmental and Socio-economic Impacts

PNG(NE) considers environmental and socio-economic factors, including the impact on land use, emissions, the local economy, customer groups and First Nations when evaluating investments to meet customer requests and demand growth.

As discussed in Section 5, PNG(NE) has prepared an external communication plan to ensure that area customers and other stakeholders are informed about the AMR Project. Further, the scope of the AMR Project is limited to the installation of ERT devices on existing metering infrastructure and the project is expected to have generally positive environmental impacts due to anticipated GHG reductions.

3 Project Description

PNG(NE) has determined that AMR remote read technology is an appropriate alternative to the current manual meter reading practice used in the northeastern British Columbia communities it serves. AMR is considered a cost-effective meter reading solution that will enable more efficient and effective meter reads and will also provide a number of operational benefits, both financial and qualitative.

3.1 Project Scope

This Application proposes implementation of an AMR system for residential and commercial customers. Industrial customers are not within the scope of the AMR Project, as industrial customers often have unique data and information requirements and many already have advanced metering systems in place.

In addition, PNG(NE) notes that PNG's PNG-West service area is not within the scope of the proposed AMR Project. PNG may consider evaluating the implementation of AMR technology for PNG-West at a future date.

3.2 Proposed AMR Infrastructure

As described previously, an AMR system consists of a meter endpoint equipped with an ERT module. The ERT module is a measuring and encoding device with a built in radio transmitter that records consumption, encodes the information, and then transmits the information via a radio frequency (RF) signal to a data collection receiver unit. AMR is a one-way communication system that can typically collect and store meter data for a period of 40 days. Various levels of AMR technology exists – from basic handheld units to fixed networks with data collection infrastructure tied to power poles and repeater units.

PNG(NE) has determined the most appropriate AMR system for its service area to be one comprised of data collection making use of ERT electronic devices that would be retrofitted to existing customer meters. The ERTs would be used in conjunction with a vehicle-mounted mobile collection unit, which consists of an existing handheld reading device in a cradle mount, an antenna and a laptop that can easily be transferred between service vehicles. Exhibit 2-3 presented previously provides an illustration of the key elements required for implementation of the AMR solution proposed by PNG(NE).

PNG(NE) has selected Itron as the preferred vendor to support the AMR Project. PNG(NE) has had a successful working relationship with Itron for over 10 years. PNG(NE) currently uses Itron's meter reading hardware and software, and interfaces are in place between the Itron system and PNG(NE)'s BBS.

The implementation of mobile collection technology will allow for the remote reading of meter data communicated by RF from the ERTs simply by driving the service vehicle equipped with the mobile collection unit in the general vicinity of customer meters without having to follow existing meter reading routes and without having to access customer premises. Mobile collection units have the capacity to read up to 30,000 meters simultaneously on one or many routes and to store data for up to 100,000 meters.

Once all readings have been gathered, the data in the mobile collection unit is downloaded to the Field Deployment Manager (FDM) interface on a server at PNG(NE)'s offices and used for customer billing purposes.

3.3 Project Management

Project management for the AMR Project will follow standard project management practices and methodologies including the use of applicable project templates and tools. Working together with Itron, PNG(NE) has been able to outline clear objectives and a project timeline and key milestones. This will allow for a scope that is focused and controlled, and will allow for budgeted resources to be closely managed.

The management of the AMR Project is supported by a cross-functional team of PNG and PNG(NE) employees. Project planning was formulated with input from all impacted departments. The sections that follow provide greater detail on how the AMR Project will be implemented and managed.

3.3.1 Project Execution

Pre-planning and business case development for the AMR Project began in December 2018. This was the first step in defining requirements and providing a basis for the selection of the appropriate technology and vendor.

Implementation of the AMR Project is planned for 2020, with activation anticipated late in the third quarter of that year. The AMR Project is comprised of the following major components:

1) Installation of the FDM interface, server and work flow configuration and testing;

2) Field installation of ERTs on existing meters; and

3) Route acceptance process testing.

Exhibit 3-1 that follows provides a schedule of key project milestones, including the execution of these key components.

Exhibit 3-1 AMR Project Milestones

Milestone	Date (2020)
Procure Materials	January
Baseline Deployment Plan	January – February
Project Control Manual Reviewed and Approved	January – February
FDM/ERT Interfaces Complete and Tested	February – March
FDM Servers Configured and Tested	March – April
FDM System and Workflow Tested	March – April
Receipt of ERTs	April
Field Installation of ERTs	May – June
Route Acceptance Process Tested	July – August
Deployment (Up and Running)	September

PNG(NE) is seeking approval for this Application by the BCUC before the end of 2019 in anticipation of the requirement to procure materials in January 2020. PNG will continue to review and refine its implementation plans as the BCUC review of this Application is defined and moves forward.

3.3.2 Roles and Responsibilities

PNG(NE)'s Manager, Operations Northeast, will have primary responsibility for overseeing the execution of the AMR Project plan. As noted previously, Itron is the preferred infrastructure vendor and will fulfill the role as quality manager. In this role, Itron will be responsible for managing the actual implementation of the AMR infrastructure, including the FDM software, and for managing subcontractors engaged to install ERTs.

Additional internal resources identified to support project execution include PNG Leadership, Information Technology, Customer Billing, Customer Services and Customer Care personnel:

- Leadership will act as project sponsor and internal champion and will ensure that all aspects of the AMR Project are aligned with the overall corporate direction;
- Information Technology has responsibility for developing and executing the strategy for system architecture, integration points, data flow, and data management;
- Customer Billing has responsibility for providing project support for delivery and integration of FDM work order files;
- Customer Services has responsibility for managing the customer meter reading operations and will provide support for ERT installations; and
- Customer Care will provide support for customer service, call center activities and customer communications.

3.4 Human Resource Transition Planning

PNG(NE) has been socializing its plan to proceed with the AMR Project with employees and union representatives. PNG(NE) first informed the International Brotherhood of Electrical Workers (IBEW) Local 213 of plans to examine the possibility of an AMR deployment in early 2019. PNG(NE) will work with the IBEW to follow the collective agreement and execute a detailed plan as necessary project approvals are obtained.

Ongoing communication with employees in regard to the proposed AMR Project is critical in reducing any unnecessary impact to the individuals directly affected. Discussions have been underway with affected staff and will continue as updates are available. PNG(NE)'s leadership team, acting as the AMR Project sponsor, will facilitate communications with the meter reading group to confirm the filing with the BCUC and to provide an opportunity to address any questions that arise.

3.5 PNG-West 2018 AMR Pilot

PNG(NE) notes that an AMR pilot project was undertaken by PNG in 2018 in the community of Thornhill, BC, situated in the PNG-West service area. The pilot was presented for review and approval as part of the PNG-West 2018-2019 Revenue Requirements Application. In this pilot, AMR infrastructure was implemented for approximately 1,700 customers in the community. The pilot was successfully implemented over a 12-week period, with the following noted achievements:

- Project completed on budget and on schedule from project planning to infrastructure deployment;
- Increase in the efficiency of meter reading duration from 4 cycles (average duration: 19 hours) to 1 cycle (average duration: 4 hours);
- Reduced meter read idling time which contributed to fuel savings;
- Staff working in Customer Service, Customer Billing, and Sales & Service gained valuable knowledge and training in using and managing issues related to AMR infrastructure (hardware and software);
- Reduction in safety risks related to meter reading; and
- Opportunity to work with Itron, the proposed vendor in this Application, to successfully execute the pilot program.

The AMR pilot continues to operate effectively. PNG(NE) has been able to leverage the lessons learned from the PNG-West pilot project in planning the AMR Project and expects to continue to benefit from the pilot project experience as it moves forward with implementation. PNG(NE) submits that the lessons learned from the pilot will reduce the risk of project delays and/or cost-over runs.

4 Project Cost Estimates

4.1 Capital Cost Estimate

As described in Section 2.3.4, PNG(NE) has proposed the Itron AMR solution for its AMR Project. The capital cost estimate for the Itron AMR infrastructure is based on a quotation from Itron, the product vendor.

4.1.1 Capital Cost Components

Exhibit 4-1 provides a summary of key capital cost components.

Exhibit 4-1 Capital Cost Components AMR Project

Component	Cost ($)
Materials – ERT Modules	1,560,745
Materials – Mobile Collection System	71,601
Installation – ERT Retrofit	1,203,639
Project Management	249,428
	3,085,413
PST (7%)	215,979
	3,301,392
Overhead (10%)	330,139
	3,631,531
Contingency (15%)	495,209
Total Capital Cost	4,126,740

As mentioned previously, PNG(NE) has an agreement with Itron to hold the quotation firm until the end of the first quarter of 2020, provide PNG(NE) with capital cost certainty for the AMR Project. In addition, PNG(NE) has included a contingency provision of 15% to address the risk of capital cost overruns.

4.1.2 Accuracy of Capital Cost Estimates

The Itron cost estimate is considered to be definitive as it is understood that Itron has a clear and thorough understanding of PNG(NE)'s requirements and applied this knowledge when preparing its quotation. Further, Itron is considered to be proficient in the implementation of AMR projects such as that proposed by PNG(NE), and hence knowledgeable of the anticipated costs to be incurred.

On this basis, PNG(NE)'s cost estimate is considered to be at a Class 1 to Class 2 level of accuracy as per the Association of Cost Engineering Guidelines 17R-97 and 18R-97 (Cost Estimating Classification System – revision November 2011) (AACE Guidelines).

4.2 Cost of Service Forecast

As noted previously, the cost of service forecast incorporated into the AMR Project NPV analysis presented in Section 2.4 includes ratebase items and a net reduction in operating costs.

Ratebase items in the cost of service forecast primarily relate to the additional capital expenditures required for the AMR Project, net of avoided capital costs for vehicles historically required for manual meter reading. Ratebase items include provisions for depreciation, taxes, capital cost allowance, interest, and return on equity. These costs are estimated to be approximately $353,000 annually over the 20-year analysis period.

PNG(NE) has included a nominal average annual provision of $22,350 for meter failure replacement and maintenance costs for the mobile collection system in the forecast for AMR Project operating costs. PNG(NE) does not anticipate any other significant incremental operating and maintenance costs.

Rather, as noted, PNG(NE) anticipates a net reduction in overall operating costs due to reductions in labour and vehicle operating costs as result of eliminating five meter reading staff positions and the five associated vehicle units dedicated to meter reading. On a net basis, PNG(NE) estimates that overall operating costs will be reduced by approximately $657,000 annually over the 20-year analysis period.

5 Communication and Consultation Plan

PNG(NE) has prepared a draft external communication plan to ensure that area customers and other stakeholders are informed about the AMR Project and will have access to information on a timely basis and in an efficient manner. The communication plan identifies all of the stakeholders in the service areas, including residents, businesses and municipal and regional authorities.

The plan will assist in identifying concerns and possible disputes and will help ensure that issues raised by affected stakeholders are resolved. A summary of communication plan milestones is provided in Exhibit 5-1.

Exhibit 5-1 Communication Plan – Identified Milestones

Item	Activity	Complete By
1	Initial development of communication materials	October 2019
2	Informational meeting with local agencies (City of Fort St. John, City of Dawson Creek, District of Tumbler Ridge)	January 2020
3	Communication with government agencies	January 2020
4	Advertisements in PNG website, local newspaper, radio, letters and emails	February 2020
5	Stakeholder communication on project updates	February 2020
6	Communication to residential and commercial customers on field installation schedule	March 2020
7	Stakeholder communication on project completion	October 2020
8	Project completion meeting with project team	October 2020

The AMR Project does not involve any greenfield construction on any First Nations land or traditional territory. The scope of the AMR Project is limited to the installation of ERT devices on existing metering infrastructure, thereby limiting the duty to consult. PNG(NE) submits that no Aboriginal or treaty rights are potentially affected, adversely or otherwise, as a result of the proposed project. Despite the fact there is no consultation requirement, PNG does regularly update First Nations on an informal basis of its activities, including operating, maintenance and capital projects.

6 Alignment with the BC Government's Energy Objectives

The nature of PNG(NE)'s investment in the AMR Project is such that it does not provide direct support for the advancement of the provincial government's energy objectives as set out in Part 1 of the *Clean Energy Act* that primarily pertains to the matters of generation, cost and conservation of electricity.[1]

However, the AMR Project is considered to generally support the intent of British Columbia's GHG reduction objectives as driven by provisions of the following legislation:

- Climate Change Accountability Act;
- BC Climate Action Charter;
- Carbon Tax Act; and
- Utilities Commission Act.

As noted previously, the AMR Project will eliminate the use of five vehicles associated with meter reading and will therefore contribute to a significant reduction in GHG emissions related to meter reading activities.

[1] See: http://www.bclaws.ca/civix/document/id/complete/statreg/10022_01

7 Acronyms and Definitions

AACE Guidelines – Association of Cost Engineering Guidelines 17R-97 and 18R-97 (Cost Estimating Classification System – revision November 2011)

ACI – AltaGas Canada Inc., parent company of PNG

AltaGas – AltaGas Ltd., former parent company of PNG

AMI – Advanced Metering Infrastructure

AMR – Automated Meter Reading

BBS – Banner Billing System, PNG(NE)'s customer billing system

BCUC – British Columbia Utilities Commission

CPCN – Certificate of Public Convenience and Necessity

CPCN Guidelines – BCUC 2015 CPCN Application Guidelines

DC – Dawson Creek

ERT – Encoder Receiver Transmitter module, transmits meter data

FCS – Field Collection System interface

FSJ – Fort St. John

GHG – Greenhouse Gas emissions

IBEW – International Brotherhood of Electrical Workers

Itron – Itron Canada Inc., vendor of the Itron meter reading technology

KTI – KTI Limited, vendor of the Sensus FlexNet meter reading technology

NPV – Net Present Value

PNG – Pacific Northern Gas Ltd., parent of PNG(NE)

PNG-West – reference to the area served by PNG

PNG(NE) – Pacific Northern Gas (N.E.) Ltd. (Applicant)

RF – Radio Frequency

TR – Tumbler Ridge

UAF – Unaccounted for gas gains and losses

UCA – British Columbia *Utilities Commission Act*

WACC – Weighed Average Cost of Capital

Appendix: Draft BCUC Order

DRAFT

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ORDER NUMBER
G-xx-19

IN THE MATTER OF
the *Utilities Commission Act*, R.S.B.C. 1996, Chapter 473

and

Pacific Northern Gas (N.E.) Ltd.
Application for Approval of a Certificate of Public Convenience and Necessity
to Implement Automated Meter Reading (AMR) Infrastructure

BEFORE:
????????, Commissioner
????????, Commissioner

on December ??, 2019

ORDER

WHEREAS:

A. On October 10, 2019, Pacific Northern Gas (N.E.) Ltd. [PNG(NE)] filed an application (Application) to the British Columbia Utilities Commission (BCUC) under section 45 and 46 of the *Utilities Commission Act* (the Act) for approval of a Certificate of Public Convenience and Necessity (CPCN) for net capital expenditures of approximately $4.13 million to undertake the implementation of automated meter reading (AMR) infrastructure in its service areas (AMR Project);

B. By Order G-XX-19 dated XX, the BCUC established a Regulatory Timetable for the proceeding to review the Application including one round of BCUC and Intervener Information Requests to PNG(NE), as well as a timetable for the filing of PNG(NE) and Intervener Final Submissions and PNG(NE)'s Reply Submission; and

C. The BCUC Panel has considered the Application, the evidence and submissions presented on the Application and has determined that it is in the public interest that a CPCN be issued to PNG(NE) for the AMR Project.

NOW THEREFORE the BCUC orders as follows:

1. Pursuant to section 45 and 46 of the UCA, a CPCN is granted to PNG(NE) for the implementation of automated meter reading infrastructure as described in the Application.

DATED at the City of Vancouver, in the Province of British Columbia, this xx day of December 2019.

BY ORDER

????????
Commissioner