



To:	GENERAL COMMITTEE	Meeting Date: 02/06/18
Subject:	Advance Meter Infrastructure (AMI) Implementation	Report No: 18-022(CD)
From:	Jamie Austin, Director Public Works Division	File No:

RECOMMENDATION(S)

THAT Council approves the establishment of a capital project for Advance Meter Infrastructure (AMI) Implementation for \$13,421,000 with funding from the issuance of Debentures;

AND THAT notwithstanding the purchasing bylaw, Council approves staff to sole source portions of the project as identified in Table 2: Procurement Details.

EXECUTIVE SUMMARY

Purpose

In February of 2015, BMA Management Consulting released the *Water/Wastewater Billing and Collection Practices and Policies* report to Council. Recommendation #6 under *Estimated Billing/Back-billing* stated that “*the city move forward with automatic meter reading technology and develop a formal plan for implementation*”. This report will provide Council with details on staffs’ proposed implementation plan for a city wide AMI program. This will include:

1. Benefits of an AMI system for the public and operation of the water distribution and meter systems
 - Improved customer service through near real-time trouble shooting of billing and meter issues, online access to advanced customer service portal, advanced notice of issues in the home (i.e. internal leaks/high bills)
 - More accurate billing with more timely notice of equipment failures, ability to focus on areas where water loss and inflow/infiltration is

- occurring, better understanding of customer supply needs and trends
2. Partnership opportunities with Energy Plus
 - As majority shareholder of Energy Plus, the City can leverage existing infrastructure through shared use of an established and proven radio read network that would allow City water meters to provide near real-time readings, at a reduced capital and operating cost in comparison to sole ownership
 3. Implementation and timeline
 - New billing system and city wide installation of AMI system beginning Q1 2018 with completion by Q4, 2020.
 4. Program costs and impacts to customers
 - Capital costs of \$13.4M over 3 years, with ongoing maintenance (operations and principle/debt) costs of \$1.98M per year
 - Zero increase to user rates due to proposed savings through reduced water loss, reduced inflow/infiltration, more accurate meter readings and more timely notices of failed equipment.

BACKGROUND

On May 12, 2017, Council directed staff to develop a process for a city wide AMI installation program and to pursue discussions with Energy Plus for a partnership. This partnership could utilize their existing electric meter communications network.

During the May presentation, the benefits of an AMI system that utilized a partnership with Energy Plus were discussed and are provided here again as follows:

Table 1: AMI Partnership Benefits

Item	Benefit
AMI System	Remote meter reading capabilities with less meter reading contract costs
	More accurate billing (for those signed up for MyWater)
	Ability to implement monthly billing
	Enhanced customer service, near real-time meter reading for troubleshooting customer concerns resulting in fewer service calls
	Customer engagement (web tools, high usage notification etc.)
	Potential to use receiver network for future applications (water loss and wastewater inflow/infiltration reduction)
	Increased revenue through mass-meter change out (approx. 2/3

Item	Benefit
	of meter population over 3 years)
	Allows Cambridge to be on the leading edge of metering technology
Energy Plus Partnership	Network infrastructure is already installed in Cambridge
	Cost sharing with Energy Plus to reduce capital and operation expenses
	Operational efficiencies by sharing services with proven quality standards
	Access to lessons learned from Energy Plus

Since the report in May, staff have been working with the approved consultant, Util-Assist Inc. Discussions have occurred with both Energy Plus and their subsequent service provider for the electric meter reading system. All agree that a sharing of this system is a viable option (see Attachment #1: Letter of Support, Energy Plus). It would result in reduced costs for the City in comparison to installation of a separate system. It is also noted that many municipalities in Ontario have chosen this same partnership route when implementing AMI systems.

ANALYSIS

Strategic Alignment:

PROSPERITY: To support and encourage the growth of a highly competitive local economy where there is opportunity for everyone to contribute and succeed.

Goal #7 - Transportation and Infrastructure

Objective 7.3 Provide innovative leadership in the management of city assets to help plan, fund and maintain city assets in a sustainable way.

A system wide 'smart' water meter program will allow the City to provide a higher service level to its water users through:

- more timely notices of billing irregularities, such as high water usage
- online access to their bill and usage patterns
- Customer Service Representatives can trouble-shoot issues over the phone with near real-time meter readings
- fewer incidents where appointments are required to access homes to investigate meter issues

Operations staff will have better understanding and control of the water distribution and metering systems. This will be accomplished through:

- timely notices of equipment malfunctions and failures
- notice of meter tampering/flow reversals and possible water theft
- understanding of water usage patterns by the public
- when used with water distribution and wastewater collection system meters, areas with water loss and inflow/infiltration can be better understood with focused reduction efforts

Comments

Staff are recommending a 3 year implementation timeline, with ongoing annual maintenance and operational requirements. Major tasks and timing are provided.

Task 1: Billing System Changes

Task – Billing System Upgrade	Timing
New Billing Program Implementation	Q2/18 to Q2/19

The city's existing billing system is not suited to function fully with an AMI system. SAP Utility Billing can be implemented at a favourable cost due to the City's existing investment in CityONE. This is accomplished through reduced integration costs and existing systems required for billing already being present.

Task 2: Phase 1 Meter Installations

Task – Pilot Deployment	Timing
1000 meters with radios installed	Q3/18 to Q2/19

This will serve as the pilot group to ensure that all meter reading communications and billing systems are functioning prior to mass deployment.

Task 3: Phase 2 Meter Installations

Task – Mass Deployment	Timing
24,000 meters with radios installed	Q3/19 to Q4/20
14,000 existing meters reprogrammed with radios	

Approximately 100 meters and/or radios per working day will be installed for 18 months.

Task 4: Ongoing Annual Maintenance and Operation Requirements

Task Detail	Timing
1 FTE – Billing (Exception reporting/notification)	Q1/19 onwards
1 FTE – Meter Group (Public Works)	

Task Detail	Timing
Maintenance Contract (Radio Reading and Meter Data Management Systems)	

Analysis of existing staffing levels in the Billing Division and Public Works Division dictate that additional internal resources will be needed.

The Billing Division will need 1 FTE for analysis of reporting exceptions (i.e. high water use at a property, meter tampering), oversight of notification to the public and utility, monitoring of system security, system performance auditing and liaison with Energy Plus and system contractors.

Public Works Division will need 1 FTE for equipment failure/issue investigation and resolution. At the present time, the Water Meter Group consists of 2 FTE and contract services. The number of meter assets under Public Works will double through the addition of 40,000 radio units.

The radio system that is owned by Energy Plus requires regular maintenance and is done by a contractor. The City of Cambridge would contribute to the maintenance of the system.

Existing Policy/By-Law:

Water Use Bylaw 146/03

- allows City to install meters on all service connections
- requires water users to provide a safe, conveniently accessible space for the meter
- allows City staff and its contractors to access meters

Purchasing Bylaw 015/04

- governs purchases made by the City
- allows single source purchasing under certain conditions, such as those created through the partnership with Energy Plus

Financial Impact:

Staff has reviewed the business case for AMI and capital costs and operating increases are expected to be offset by savings resulting in no impact on user rates.

Capital Cost Investment

AMI Total Capital Cost Investment

\$13,421,498

Operating Impact For AMI

Debt Financing Costs

1,157,800

Annual Estimated Operating Costs

1,176,300

Meter Reading Savings	-210,000
Meter Accuracy Loses Reduction	-145,600
Total Net Cost For AMI	\$1,978,500
Rate Impact To Implement AMI	3.00%
<u>Waterloss & I& I Reduction Savings</u>	
Potential Further Water Loss Reductions (1% in 2019 & 2020)	512,575
Potential Further I&I Loss Reductions (1% in 2019 & 2020)	1,465,925
	\$1,978,500
Rate Impact From Reductions (Waterloss & I&I)	-3.00%
Expected Rate Impact From Implement AMI	0.00%

Reductions are to be expected in water loss and inflow and infiltration (I&I) with assistance from the AMI system by 1.0% in 2019 and 2020. The program will require the replacement of 25,000 meters immediately with new, more advanced meters whose accuracy are guaranteed for the life of the meter (20 years) and can warn of tampering or potential theft. This potential increase in revenue helps to reduce water loss and I&I.

An AMI system has several components. As Cambridge will be using Energy Plus' existing radio reading system, some of these components must be single sourced for compatibility purposes while others can be tendered. Single source tendering is in conformance with City of Cambridge Purchasing Bylaw 015/04.

Table 2: Procurement Details

Item	Details	Source
Water Meter Supply and Maintenance	Device that measures water usage	Single Source
Radio Supply	Device that transmits water meter reading	Single Source

Item	Details	Source
Water Meter and Radio Installation	Third party services for meter and radio installations	Tendered Source
Meter Data Management	System that receives, stores, processes and delivers collected meter reading	Single Source
Radio Read Network Maintenance	Third party maintenance for Radio Reading Network	Single Source
Consulting Services	Project Management and Legal Review	Single Source

Public Input:

Public input on the City's water meter reading and billing system is received by staff and Council through email, phone calls and service requests. This was most apparent when the City took over the billing functions from Energy Plus in 2010. Following this change, frequent complaints from the public were received by staff and Council. This input was used to guide improvements to the existing billing and metering system as recommended by BMA Management Consulting's 2015 report. Public input specific to this project however has not been sought by staff. Should Council direct staff to move towards implementation, a community engagement program shall be used prior to and during implementation. Customer feedback would also be sought.

Internal/External Consultation:

Util-Assist Inc. has been used to assist staff with the review of available technology, development of a business case, costing, and creation of tendering documents should Council direct staff to proceed with an AMI system implementation.

Consultation with the following potentially impacted internal divisions has occurred:

- Public Works Water and Meter Operations
- Billing/Finance Division
- Technical Services
- Legal Services
- Asset Management

Energy Plus and their meter reading system maintenance contractor were consulted to confirm shared service possibilities and the associated costs. At this time, Staff are recommending that the City proceed with shared services for the meter reading system

only. The potential of Energy Plus providing billing and customer service functions was reviewed and it was decided to maintain these services with existing City resources.

CONCLUSION

Staff has reviewed existing metering technology and is recommending an Advanced Meter Infrastructure (AMI) system that would see a City-wide installation program completed by December 31, 2020. This system will have many benefits for both water users and Operations staff.

Projected cost savings through water loss and inflow/infiltration reductions, as well as more accurate meter billings will allow this new technology to be installed and maintained at no increase to projected user rates.

Should Council chose not to implement this AMI system, existing billing and metering systems can be used with the same user rates in place. This is not recommended as water loss through older metering technology will remain the same and no improvements to customer service through new technology can be achieved. New metering technology also offers Operations Staff an additional tool to reduce water loss and inflow/infiltration in the piping system. An AMI system would also keep Cambridge on the leading edge of technology, which has already been implemented in full or in part by many of our neighboring municipalities as well as many around the world.

SIGNATURE

Prepared by:



Name: Jamie Austin

Title: Director, Public Works Division

Departmental Approval:



Name: Hardy Bromberg

Title: Deputy City Manager - Community Development

City Manager Approval:

A handwritten signature in black ink, appearing to read "Gary Dyke". The signature is written in a cursive style with a large, looping initial "G".

Name: Gary Dyke
Title: City Manager

ATTACHMENT

Appendix "A" - Letter of Support: Energy Plus

Appendix "A"



ENERGY+ INC.

1500 Bishop Street, P.O. Box 1060, Cambridge, Ontario N1R 5X6 • Telephone 519-621-3530 • Facsimile 519-621-0383
Website www.energyplus.ca

January 23, 2018

City of Cambridge
50 Dickson Street
P.O. Box 669
Cambridge, ON
N1R 5W8

Attention: Jamie Austin, Director of Public Works

Dear Jamie,

I would like to thank you and your staff for the information exchange and discussions we have had with respect to a partnership that will help the City of Cambridge with its wireless water meter reading initiative.

I also want to confirm that Energy+ is supportive of moving forward with appropriate agreements to utilize the wireless system that Energy+ already has in place to read electricity meters to also read water meters.

A handwritten signature in blue ink, appearing to read "Ian Miles".

Ian Miles
President & CEO
Energy+ Inc.

c.c. Gary Dyke, City Manager