

# Attachment No. 14

**TO:** Secretary, Administration and Finance Committee  
**FROM:** General Manager, Utility Services Department  
**DATE:** May 23, 2013  
**SUBJECT:** Advanced Metering Infrastructure (AMI) Project  
Saskatoon Light & Power Capital Project 1250: AMI Implementation  
Water & Wastewater Treatment Branch Capital Project 1055: AMR  
Infrastructure  
**FILE NO:** CK. 1550-2 and WT. 2030 4

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**RECOMMENDATION:** that a report be forwarded to City Council recommending that a Request for Proposals be issued for engineering consulting services to develop an Advanced Metering Infrastructure functional design for electricity and water metering.

## **TOPIC AND PURPOSE**

Your Administration is requesting that City Council approve issuing a Request for Proposals (RFP) for engineering consulting services to develop an Advanced Metering Infrastructure (AMI) functional design for electricity and water metering for City of Saskatoon Utilities. An AMI system is used to transmit electricity usage data and water consumption data to a central billing system, and provides benefits to customers, City operations, and the environment.

## **REPORT HIGHLIGHTS**

1. Saskatoon Light & Power has been implementing a meter replacement program since 2008.
2. The Water and Wastewater Treatment Branch has an ongoing program to replace water meters every 20 years.
3. No current employees will lose their jobs as a result of this project.
4. AMI systems offer several benefits to customers and the environment.
5. No implications for public health & safety or privacy are expected.
6. The next step for the AMI project is to issue an RFP for consulting services.

## **STRATEGIC GOALS**

This report supports the long-term strategy to increase productivity by being more efficient in the way we do business under the Strategic Goal of Continuous Improvement. The report also supports the long-term strategy to increase revenue sources and reduce reliance on residential property taxes under the Strategic Goal of Asset and Financial Sustainability. By eliminating the need to read meters manually this will also reduce greenhouse gas (GHG) emissions tied to City operations, under the Strategic Goal of Environmental Leadership.

## **BACKGROUND**

On October 3, 2005, a report was presented to City Council regarding a project to implement an Automated Meter Reading (AMR) system for Saskatoon Light & Power and the City's water utility. The total cost of the project at that time was estimated at \$30 million, with capital payback anticipated over a seven to ten year period. These estimates were based on a feasibility study completed in May 2005.

The Automated Meter Reading (AMR) system was never implemented, and all electricity and water meters continue to be read manually once every three months.

An Advanced Metering Infrastructure (AMI) system can provide additional benefits over an AMR system through advanced data applications and by providing interactive tools for utility customers. As part of the AMI system, electricity and water meters measure and record electricity usage and water consumption by time intervals throughout the day, and transmit the data through a network of collectors to a central system. The combination of electronic meters and the communication system to remotely read the meters is often referred to as a "Smart Meter" system. All data is encrypted and transmitted over a secure network using a combination of wireless and wired technology.

## **REPORT**

### **Electricity Metering for Saskatoon Light & Power**

Saskatoon Light & Power began a program in 2008 to replace all of its existing electro-mechanical electricity meters with electronic meters. These meters are compatible with an AMI system. Electro-mechanical meters slow down over time resulting in lower readings and reduced revenue for the City, and difficulties in meeting Measurement Canada accuracy requirements.

To date, approximately one-third of the nearly 60,000 electricity meters have been replaced, and all remaining meters are planned for replacement by the end of 2017. Saskatoon Light & Power (SL&P) has invested \$3.2 million in its Meter Replacement Program through the end of 2012, and the total cost of the program is estimated at \$12 million. Capital development requirements to complete the program are as follows:

<b>Year</b>	<b>Number of Meters</b>	<b>Total Deployment</b>	<b>Capital Budget (\$ Millions)</b>	<b>Cost per Meter (installed)</b>
2013	8,000	27,300	\$1.6	\$200
2014	8,500	35,800	\$1.8	\$212
2015	8,200	44,000	\$1.8	\$220
2016	8,000	52,000	\$1.8	\$225
2017	8,000	60,000	\$1.8	\$225

At the completion of the program, it is estimated this conversion to electronic meters will result in additional annual revenues of \$1 million as a result of more accurate metering and the reduction in lost revenue due to meter failure.

With an AMI system, it will also be possible to perform some electrical service connects and disconnects remotely, and it is expected that two Meter Installer positions will be phased out through attrition, redeployment and/or retraining resulting in annual cost savings of approximately \$170,000. Other operational benefits that could result include faster restoration of power following an outage, and more efficient operation of the electric system, leading to additional cost savings of over \$500,000 annually.

Smart meters allow customers access to timely and accurate data, and help customers to manage their energy consumption and save money.

#### Water Metering for the City of Saskatoon

The Water and Wastewater Treatment Branch (WWTB) has an ongoing program to replace water meters every 20 years to ensure fair and equitable measurement of water consumption for customers and the City. Most existing water meters use a scan-pad device on the meter that allows the meter to be read from outside using a hand-held device. With the implementation of an AMI system, the scan-pads will be replaced with AMI communication modules, or for some customers the entire meter will be replaced with an AMI-compatible meter. The replacement program for the nearly 70,000 water meters is planned for implementation beginning in 2014 and continuing through 2025.

The total cost for the Water Meter Replacement Program is estimated at \$9.2 million. Capital development requirements to complete the program are as follows:

Year	No. Meters	Total Deployment	Capital Budget (\$ Thousands)	Cost per Meter (Installed)
2014	2,000	2,000	\$330	\$165
2015	2,500	4,500	\$420	\$168
2016	4,500	9,000	\$774	\$172
2017	4,500	13,500	\$787	\$175
2018	4,500	18,000	\$805	\$179
2019	4,500	22,500	\$819	\$182
2020	4,500	27,000	\$837	\$186
2021	4,500	31,500	\$850	\$189
2022	4,500	36,000	\$868	\$193
2023	4,500	40,500	\$886	\$197
2024	4,500	45,000	\$904	\$201
2025	4,500	49,500	\$922	\$205

In addition to the deployment above, approximately 20,000 water meters will be changed out as part of the ongoing program to replace water meters once every 20 years. These costs have not been included in the above table.

At the completion of the replacement program, it is estimated this will result in additional annual revenues of over \$2.7 million from more accurate metering.

Other operational benefits include improved metering accuracy and more efficient operation of the water distribution system, as an AMI system will assist in identifying water leakage. Future leak detection and water main repair could result in estimated annual savings of over \$150,000 in chemical and energy costs at the Water Treatment Plant.

Smart meters allow customers access to timely and accurate data, and help customers manage their water consumption resulting in cost savings.

#### Impact on Staff

No current employees will lose their jobs as a result of this project. It is estimated that twelve (12) full-time positions will be phased out over the next ten years. These positions include ten Meter Reader positions in C.U.P.E. Local 59 (leading to annual cost savings of over \$700,000) and two Meter Installer positions in I.B.E.W. Local 319. Other positions may see their job duties change over time as a result of this project. Any impact on jobs will be dealt with through attrition, redeployment, and retraining.

#### Customer and Environmental Benefits

Customer benefits include the following:

- Monthly billing will be based on actual usage rather than estimates.
- Customers can manage their electricity and water consumption by having access to timely and accurate data, thereby saving money and helping the environment.
- Customers can detect unusual consumption, such as for water leaks or when large electrical appliances are left on.
- Power outages will be automatically reported through the AMI system, and crews will be dispatched to the exact location of the problem, allowing faster restoration of power.

When the AMI System is fully implemented, all meter reading will be done remotely, and some electrical service connects and disconnects will be performed remotely as well. This will save approximately 50,000 kilometers per year of driving presently done by Meter Readers and Meter Installers, resulting in reductions in annual greenhouse gas emissions of 10 tonnes per year related to vehicle operation.

#### Public Health & Safety and Privacy

AMI systems have been implemented in several jurisdictions across Canada, North America, and worldwide. The public has expressed concerns in some jurisdictions about radio frequency exposure and protection of privacy.

Smart meters are equipped with wireless network capability and therefore their use does result in radio frequency (RF) emissions. RF emissions from smart meters are at

very low levels in comparison to other sources such as cellular phones and common household electronic equipment, and are well below Industry Canada and Health Canada regulations.

The City of Saskatoon complies with Saskatchewan's privacy legislation, and will apply the same privacy protection standards for the AMI system as are used for the current billing system. All data collected is only used to ensure accurate billing. All data and meter identification information is encrypted and transmitted over a secure network, and does not include any personal information.

#### Request for Proposals for Consulting Services

The RFP for engineering consulting services includes the following scope of work, and is estimated at \$400,000.

- A study recommending the most effective AMI strategy for the City of Saskatoon.
- Recommendation of Wide Area Network communication technology options.
- Cost estimates for the AMI system and optional applications.
- Project management, system design specifications, and quality assurance (this is an optional component of the scope of work, should the AMI project proceed to implementation).

#### OPTIONS TO THE RECOMMENDATION

The recommendation could not be approved, and the City could continue with manual meter reading.

#### POLICY IMPLICATIONS

There are no known policy implications.

#### FINANCIAL IMPLICATIONS

Adequate funding is available in SL&P Capital Project #1250 – AMI Implementation, and WWTP Capital Project #1055 – AMR Infrastructure.

Budgeted	Unbudgeted	Capital	Operating	Non-Mill Rate	External Funding
\$400,000		\$400,000			

The overall cost of the AMI project is estimated at \$3 million, and includes the AMI system and Meter Data Management System, the data collector network infrastructure, integration with the existing billing system, engineering and project management. Any advanced applications or interactive tools for customers are over and above this cost estimate, and final costs will depend on the overall scope for the AMI system.

The AMI Project is expected to pay for itself within seven years.

## **PUBLIC AND/OR STAKEHOLDER INVOLVEMENT**

Meetings have been held with C.U.P.E. Local 47 (Water Meter Shop), C.U.P.E. Local 59 (Revenue Branch), and I.B.E.W. Local 319 (Saskatoon Light & Power) to discuss the project and obtain feedback. Meetings were also held with any staff that would be affected in each of the branches.

Saskatoon Light & Power has had further correspondence with I.B.E.W. Local 319 to address some questions regarding project implementation, and there are no outstanding issues. The positive attributes of the AMI system were well received by C.U.P.E. Local 47 and there has not been any feedback since the initial presentation. Discussion with C.U.P.E. Local 59 centred on the plan for phasing out of Meter Reader positions. It was agreed that communication between Revenue Branch and C.U.P.E. 59 would be ongoing throughout the project as Meter Reader positions were affected.

## **COMMUNICATION PLAN**

A Communication Plan has been developed to inform stakeholders about smart meters, how they work, and the installation process. The plan will focus on providing highlights to all citizens, and making available detailed information to those who are interested regarding the benefit to customers and the City. Environment benefits will also be highlighted.

Open houses will be held to provide information and answer questions. Printed tools will include utility bill inserts, and information will be provided to community associations for their newsletters. The Mayor and City Council will receive updates on the project at significant milestones, as will the local news media. Attachment 1 is a list of Frequently Asked Questions and Responses.

## **DUE DATE FOR FOLLOW-UP AND/OR PROJECT COMPLETION**

Award of the RFP is expected to occur by November of 2013, and at that time Administration will bring the award to Council seeking approval. Administration will report back to City Council following completion of the consultant's recommendations for the AMI strategy and communication options, and completion of cost estimates. A detailed financial analysis will be completed at that time including cost benefits for various optional applications. The next step would be to issue a tender for implementation of the AMI system.

## **ENVIRONMENTAL IMPLICATIONS**

The recommendation will have resource consumption and GHG emissions implications associated with replacing existing meters with smart meters. However, implementation of the 'smart' meter technology – planned by end of 2024 – will result in significant annual GHG emissions reductions associated with the ability to retrieve and verify meter data remotely, eliminating the requirement to operate fleet vehicles to read meters

manually. The overall impact on GHG emissions is unknown at this time and will be included in a future report, where applicable.

The recommendation is expected to have positive implications for water resources resulting from a reduction in losses of pumped water through the distribution system. The GHG emissions reductions created by the reduced water use are estimated at 3,300 tonnes CO<sub>2</sub>e, which is the equivalent of removing over 650 cars from the road each year.

### **PRIVACY IMPACT**

The City of Saskatoon complies with Saskatchewan's privacy legislation, and will apply the same privacy protection standards for the AMI system as are used for the current billing system. All data collected is only used to ensure accurate billing. All data and meter identification information is encrypted and transmitted over a secure network, and does not include any personal information.

### **SAFETY/CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)**

A CPTED review will not be required.

### **PUBLIC NOTICE**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

### **ATTACHMENT**

#### 1. Smart Meters Frequently Asked Questions

Written by: Kevin Hudson, Metering & Sustainable Electricity Manager  
Saskatoon Light & Power

Reviewed by: Trevor Bell, Manager  
Saskatoon Light & Power

Approved by: "Jeff Jorgenson"  
Jeff Jorgenson, General Manager  
Utility Services Department  
Dated: "June 10, 2013"

Approved by: "Kerry Tarasoff" Acting for  
Marlys Bilanski, General Manager  
Corporate Services Department  
Dated: "June 11, 2013"

Approved by: "Mike Gutek" Acting for

Murray Totland, City Manager  
Dated: June 12, 2013

AMI Report

**Frequently Asked Questions and Responses:**

**What is a smart meter?**

A smart meter is an electronic meter that has the ability to measure and record power usage and water consumption by time intervals throughout the day. When a city-wide communication system is implemented, the smart meters transmit data wirelessly over a secure network through a system of collectors to a central Meter Data Management System. Smart meters are being used more and more around the world. With a smart meter, meter reading can be done remotely.

**How are smart meters different than what's being used now?**

The existing meters are not electronic – they are mechanical which means they use mechanical parts that spin as electricity is used and they portray readout on small dials that meter readers record while at a home or business. This reading is then used to calculate bills. Smart meters track consumption electronically and then use a secure network to communicate directly with the City.

**What if I don't want a smart meter?**

There may be an option to provide you with a meter that does not have a communication function embedded in it; however, you would be required to pay an additional monthly fee for performing manual meter reading.

**When will the project start?**

In 2008, SL&P began replacing old meters in their franchise area (1958 City boundary) with new electronic meters. To date, about 1/3 of the new electronic meters have been installed. Installation should be complete by the end of 2017.

**So the project has been approved then? Why didn't I know about this?**

The project has not yet received final approval to proceed. The replacing of meters happens on an on-going basis due to aging. In summer 2013, a report to City Council will request approval to proceed with a Request for Proposal for Consulting Services to develop the Advanced Meter Infrastructure (AMI) communication system.

**Are smart meters safe?**

While some concerns have been raised over the safety of smart meters with respect to health, radio frequency emissions generated by the smart meters is no different than for cellular telephones and other common household appliances, except it is generated at much lower levels and only for short periods throughout the day.

Smart meters are equipped with wireless network capability, therefore their use results in radio frequency (RF) emissions. These however, are well below Industry Canada and Health Canada regulations. The RF exposure from the meter is very small in comparison to other RF sources.

**Will my billing data be safe if it's being transmitted wirelessly?**

The City will apply the same privacy protection standards as the current system has in place. All data collected, including the usage information obtained by smart meters, will be used only to ensure accurate billing. Only encrypted meter readings and meter identification are transmitted through smart meters, not your personal information. SL&P and the City of Saskatoon comply with Saskatchewan's privacy legislation.

**Will any jobs will be lost as result of the use of smart meters?**

No, however, meter reader positions will be phased out over the next 10 years through attrition, retraining and redeployment. Two meter installation positions will also be phased out through attrition.

**F) Advanced Metering Infrastructure (AMI) Consulting Services  
Saskatoon Light & Power Capital Project #1250: AMI Implementation  
Water & Wastewater Treatment Branch Capital Project #1055: AMR  
Infrastructure  
(File No. 2030-4)**

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- RECOMMENDATION:**
- 1) that the proposal submitted by Util-Assist Inc. to develop an Advanced Metering Infrastructure functional design for electricity and water metering be accepted, at a total cost of \$399,981.75 including taxes; and
  - 2) that the City Solicitor be instructed to prepare the Engineering Services Agreement for execution by His Worship the Mayor and the City Clerk under the Corporate Seal.

**TOPIC AND PURPOSE**

Your Administration is recommending that City Council approve accepting the proposal of Util-Assist Inc. to provide engineering consulting services to develop an Advanced Metering Infrastructure (AMI) functional design for electricity and water metering for City of Saskatoon Utilities. An AMI system is used to transmit electricity usage data and water consumption data to a central billing system, and provides benefits to customers, City operations, and the environment.

Once Util-Assist Inc. provides its recommendations for the most effective AMI strategy, communication technology options and cost estimates for the system and implementation (approximately February 2014), Administration will make a final recommendation to City Council on whether or not to proceed with the implementation of AMI in Saskatoon.

**REPORT HIGHLIGHTS**

1. The scope of work for engineering consulting services includes six work packages and engages the consultant through full implementation of the AMI project to mid-2015.
2. Nine proposals were received in response to the Request for Proposal issued on July 30, 2013.
3. The proposal submitted by Util-Assist Inc. ranked first respecting a combination of price and quality parameters and is within budget.

**STRATEGIC GOALS**

This report supports the long-term strategy to increase productivity by being more efficient in the way we do business under the Strategic Goal of Continuous Improvement. The report also supports the long-term strategy to increase revenue sources and reduce reliance on residential property taxes under the Strategic Goal of

Asset and Financial Sustainability. By eliminating the need to read meters manually, this will also reduce greenhouse gas (GHG) emissions tied to City operations, under the Strategic Goal of Environmental Leadership.

## **BACKGROUND**

At its meeting on June 24, 2013 City Council approved issuing a Request for Proposals for engineering consulting services for the Advanced Metering Infrastructure.

## **REPORT**

### **Scope of Work for Engineering Consulting Services**

The RFP for engineering consulting services includes the following scope of work.

- A study recommending the most effective AMI strategy for the City of Saskatoon.
- Recommendation of Wide Area Network communication technology options.
- Design specifications and cost estimates for the AMI system and optional applications.
- Project management and quality assurance (this is an optional component of the scope of work, should the AMI project proceed to implementation).

### **Nine Proposals Received**

On July 30, 2013, Saskatoon Light & Power issued a Request for Proposals for the AMI Consulting Services.

The evaluation criteria shown in the Request for Proposals gave Price and Quality Parameters as follows: Company Related Experience represents 10%; Team Member Experience represents 30%; Methodology and Schedule represents 35%; Past Performance represents 15%; and Total Price represents 10% for a total possible of 100%.

On August 30, 2013, nine proposals were received. An evaluation team made up of representatives from Saskatoon Light & Power, the Water & Wastewater Treatment Branch, the Revenue Branch, and the Environmental Services Branch evaluated all proposals based on the evaluation criteria. The Util-Assist Inc. proposal scored the highest in the evaluation. This company has significant project experience with similar Canadian utilities in Alberta, British Columbia, and Ontario, and has worked extensively with Elster Canada (the meter manufacturer used by City of Saskatoon Utilities).

As the submission by Util-Assist Inc. is within budget and the evaluation score was the highest, it is recommended that its proposal be accepted, at a total cost of \$399,981.75 including taxes.

## **OPTIONS TO THE RECOMMENDATION**

The recommendation could be rejected, and the City could continue with manual meter reading.

## **POLICY IMPLICATIONS**

There are no known policy implications.

## **FINANCIAL IMPLICATIONS**

Adequate funding is available in SL&P's Capital Project #1250 – AMI Implementation, and WWTP Capital Project #1055 – AMR Infrastructure. The cost of the recommended proposal is \$399,981.75 including taxes, and is therefore within the budgeted allowance of \$400,000.00.

Budgeted	Unbudgeted	Capital	Operating	Non-Mill Rate	External Funding
\$399,981.75	---	\$399,981.75	---	---	---

The overall cost of the AMI project is estimated at \$3 million. The project includes the AMI System and Meter Data Management System, the data collector network infrastructure, integration with the existing billing system, engineering and project management. Any advanced applications or interactive tools for customers are over and above this cost estimate, and final costs will depend on the overall scope for the AMI system.

The AMI Project is expected to pay for itself within seven years.

## **PUBLIC AND/OR STAKEHOLDER INVOLVEMENT**

Meetings were held with C.U.P.E. Local 47 (Water Meter Shop), C.U.P.E. Local 59 (Revenue Branch), and I.B.E.W. Local 319 (Saskatoon Light & Power) to discuss the project and obtain feedback. Meetings were also held with any staff that would be affected in each of the branches.

## **COMMUNICATION PLAN**

A Communication Plan has been developed to inform stakeholders about smart meters, how they work, and the installation process. The plan focuses on providing highlights to all citizens, including that smart meter radio frequency (RF) emissions are well below Health Canada and Industry Canada regulations, and are generated at much lower levels than for cell phones, and only for short periods throughout the day. Detailed information will be made available to those who are interested regarding the benefit to customers and the City. Environmental benefits will also be highlighted.

Open houses will be held to provide information and answer questions. Printed tools will include utility bill inserts, and information will be provided to community associations for their newsletters. The Mayor and City Council will receive updates on the project at significant milestones, as will the local news media.

The City is working in partnership with SaskPower and SaskEnergy to ensure continuity in communications with citizens.

Attachment 1 is a list of Frequently Asked Questions (FAQs) which will be available on the City's website. Copies will also be available at the Public Open Houses.

### **DUE DATE FOR FOLLOW-UP AND/OR PROJECT COMPLETION**

Administration will report to City Council following completion of the consultant's recommendations for the AMI strategy and communication options, and completion of cost estimates. A detailed financial analysis will be completed at that time including cost benefits for various optional applications. The next step would be to issue a tender for implementation of the AMI system.

### **ENVIRONMENTAL IMPLICATIONS**

The recommendation will have resource consumption and GHG emissions implications associated with replacing existing meters with smart meters. However, implementation of the 'smart' meter technology – planned to be fully completed by the end of 2024 – will result in significant annual GHG emissions reductions associated with the ability to retrieve and verify meter data remotely, eliminating the requirement to operate fleet vehicles to read meters manually. The overall impact on GHG emissions is unknown at this time and will be included in a future report, where applicable.

The recommendation is expected to have positive implications for water resources resulting from a reduction in losses of pumped water through the distribution system. The GHG emissions reductions created by the reduced water use are estimated at 3,300 tonnes CO<sub>2</sub>e, which is the equivalent of removing over 650 cars from the road each year.

### **PRIVACY IMPACT**

The City of Saskatoon complies with Saskatchewan's privacy legislation, and will apply the same privacy protection standards for the AMI system as are used for the current billing system. All data collected is only used to ensure accurate billing. All data and meter identification information is encrypted and transmitted over a secure network, and does not include any personal information.

### **SAFETY/CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)**

This project will not be subject to a CPTED review.

## **PUBLIC NOTICE**

Public Notice, pursuant to Section 3 of Policy No. C01-21, Public Notice Policy, is not required.

## **ATTACHMENT**

### 1. Frequently Asked Questions

Written by: Kevin Hudson, Metering & Sustainable Electricity Manager

Reviewed by: Trevor Bell, Manager, Saskatoon Light & Power  
Reid Corbett, Manager, Water and Wastewater Treatment Branch

Approved by: “Jeff Jorgenson”  
Jeff Jorgenson, General Manager  
Utility Services Department  
Dated: Oct. 8, 2013

Approved by: “Marlys Bilanski” for  
Murray Totland, City Manager  
Dated: Oct. 11, 2013