MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Simpson, Brown, Helgeson, Manning and Mital

FROM: Greg Armstead, AMI Project Manager

DATE: July 26, 2013

SUBJECT: Advanced Metering Infrastructure (AMI)

OBJECTIVE: Information Only - AMI project update

Issue

In October, 2013, the Board of Commissioners will be asked to consider the AMI project for implementation.

With significant information having been previously provided to the Board regarding RF and possible or claimed related health effects, business case and financial impacts, staff seeks to brief the Board with a summary of how an AMI project would be implemented.

This information anticipates that the Board will want to fully evaluate both why this project is recommended and how management expects to complete an AMI deployment before making a final decision to authorize the project. The remainder of this memorandum focuses on the "how".

Background

In March, 2010, the during their annual Strategic Plan review, the Board of Commissioners directed the previous General Manager to renew previously held efforts to plan an AMI implementation. AMI (and formerly AMR) have been under consideration by EWEB since 2005. Along with several intervening updates, in April, 2012, management brought to the Board a business case analysis of AMI which covered four scenarios – business as usual, electric only, water and electric combined (operational benefits only) and an advanced scenario which evaluated longer term resource benefits and additional customer services. The Board narrowed management's focus to this advanced scenario, presented as "Scenario#3".

In March, 2013, staff and management presented to the Board an analysis of a contract negotiated with an AMI system provider, Sensus USA, a firm selected after a two-stage public bid process. At that time, management reiterated that the Board had yet to approve the AMI project as a whole initiative and subsequently determined that it would make more sense to address the contract approval and project approval simultaneously. The Board's March, 2013 contract approval was for the limited purposes stated at that meeting.

Since March, 2013, staff and management have provided 1:1 updates to Board members on the business case analysis, conducted an in-depth briefing for the Board and community of RF and related health concerns, and provided information about the financial impact of AMI through the Long-Term Financial Plan (LTFP) reviewed by the Board in July, 2013.

Discussion

The following describes the AMI project plan.

Section 1 – Schedule

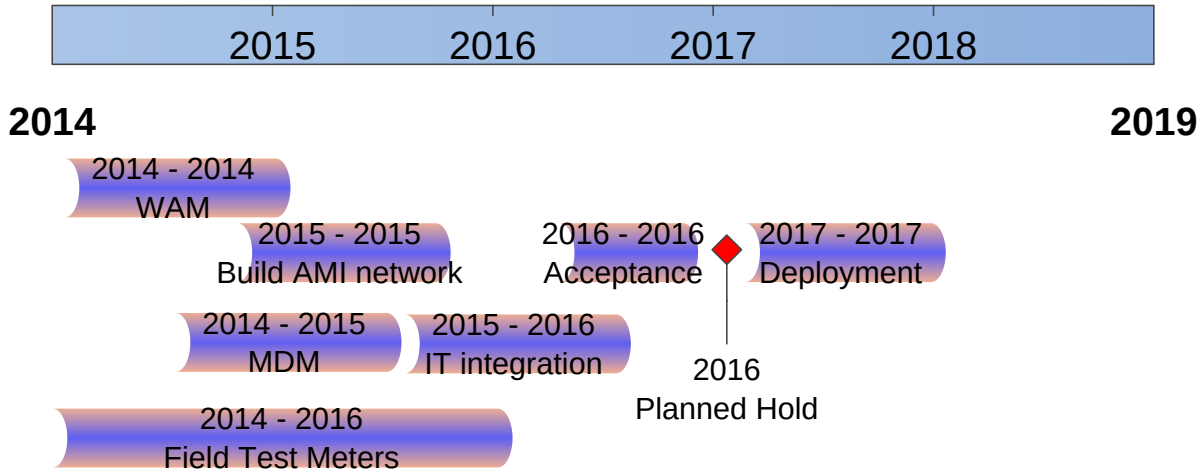
The major time elements and general schedule are shown below. Management describes the large scale roll out as occurring in 2017 and this timeline puts that in context.

2017 is planned as the primary rollout year. The significant majority of effort and expense will occur in this 12 month period, which represents an optimized time frame to change out approximately 142,000+ meters (electric and water).

Several significant milestones must occur in front of that. Working backwards, management plans a smaller scale Initial Acceptance Test (IAT) to occur in 2016, and a planned hold will occur between the IAT and general roll out. This will allow for 3rd party mobilization, as well as allow staff to account for any lessons learned in the IAT that must be addressed before deployment. This is also one of several risk management safeguards in the contract.

Continuing to work backwards, key IT integration efforts must complete before IAT, so they can be tested. These include integration AMI with back-end customer billing and meter data management systems, and others. Prior to that, the communications network must be built and a Meter Data Management system implemented. The first task Work Asset Management (WAM) is shown as a key dependency. WAM must be successfully rolled out before AMI work begins in earnest. Each of these activities also mitigates project risk.

Simultaneous to this timeline, the meter shops will have a two year period to conduct a rigorous field test of all the possible meter types and manufactures, to determine which meters best fit our needs. This is yet another form of project risk management (safety, quality, functionality, etc.)



Section 2 – Cost Management

The major elements of the Sensus USA contract are fixed price, providing a high level of cost certainty in this project. Key elements of cost control include:

- 5 year fixed price on all meter purchases
- Network price is fixed and ensures >99.5% coverage (abilility to reach meters)
- AMI to back-end systems integration is fixed at $1.9m
- Warranty reimbursement covers equipment costs and labor, if failures occur
- Installation (change out) costs are fixed per meter

The project cost is described as a $24 million capital project. Major cost breakdowns are as follows:

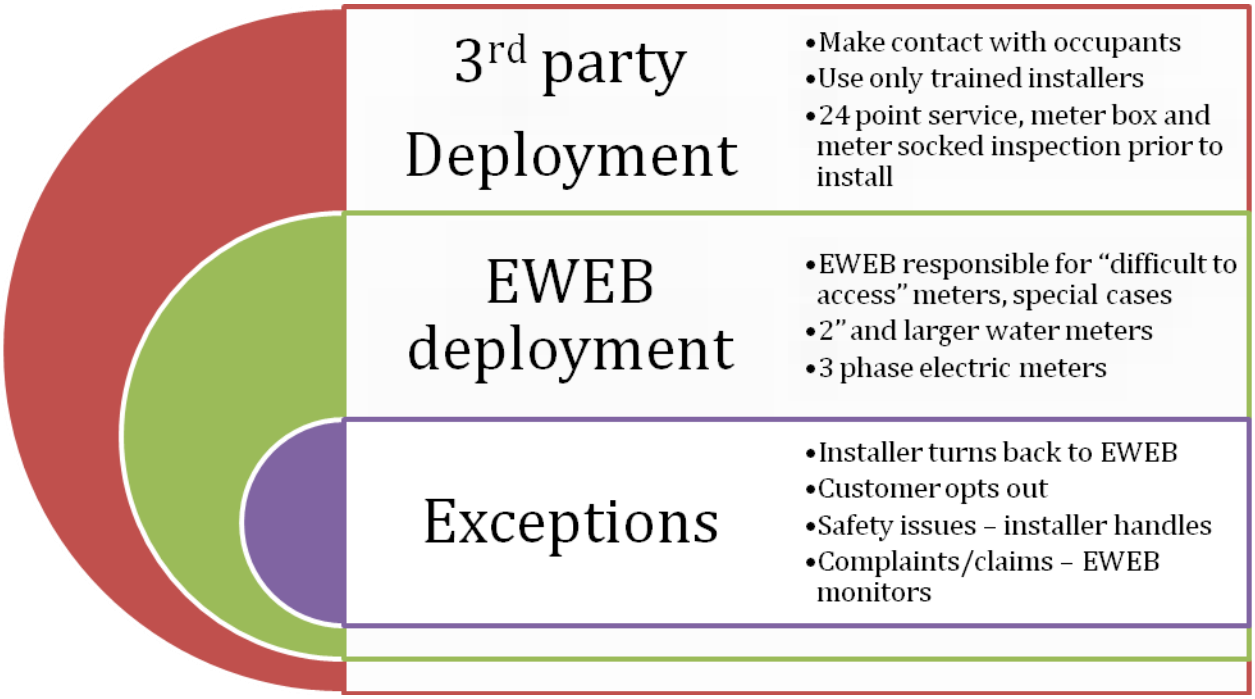
- Electric meters - $11.9
- Water registers, modules and lids - $5.4m
- IT (project management, integration, networking - $7.8m

Section 3 – Full Deployment (Summarized)
A key element of this project, full deployment, can be described as a logistics project that is essentially 142,000+ short cycle work orders (meter change outs).

The caption below describes that the largest portion of work with be accomplished by a 3rd party installer, who will be responsibility to contact occupants, use trained installers and conduct a thorough inspection of the meter base prior to performing each change out.

A smaller scope of work involves the meter deployments that will be done by EWEB. These include larger water meters, larger electric services, and difficult to access cases best handled by EWEB staff. This scope of work also accounts for "turn backs" where the 3rd party installer failed to handle a change out. There are financial incentives for the 3rd party to have a very limited number of turn backs.

The smallest scope of work will involve handling situations and exceptions that inevitably arise, such as when safety or tamper issues are discovered by installers, or when customers have a negative encounter with an installer. This scope of work also accounts for "turn backs" where the 3rd party installer failed to handle a change out. There are financial incentives for the 3rd party to have a very limited number of turn backs.



Section 4 – Project Communications

There is a detailed communications plan in place for informing the public at large, neighborhood wide notifications and individual customer communications just prior to meter deployment. The key element of this plan is to inform people before a pending change out occurs, allow them opportunity to reschedule and accommodate opt-outs where requested. This plan will be revised as the project gets closer to full scale deployment. Lessons learned from Initial Acceptance Test, as well as

lessons learned from other utility deployments, will guide development of customer communication plans.

A second part of the AMI Communications Plan addresses developing an appropriate staff orientation to the AMI technology, project plans. EWEB staff, particularly those that encounter customers, will need to have the right information to address customer questions and concerns.

Section 5 – Quality Assurance and Acceptance

As noted in the schedule, the project plan incorporates a lengthy field test of available meters. While EWEB is buying the Sensus AMI system, it is not committed to buying only Sensus meters. On the electric side, EWEB will evaluate meters from Sensus, L+G, Elster and GE before choosing the appropriate combination. Durability, safety and accuracy will be among the key features evaluated.

In addition to the field test, the project plan calls for 3 levels of acceptance testing.

- An initial acceptance test where the network is built, 3% of the meters are deployed and all elements of the system, all the way through customer billing, is tested against pre-defined specifications.
- On-going QA testing will occur during the primary rollout. This will involve both sample testing of meter shipments by EWEB's shop personnel, as well as visual inspections of 3rd party installations prior to acceptance and payment for deployed meters.
- At the conclusion of the project, approximately $2 million dollars of withheld funds will be paid only at successful conclusion of a Final Acceptance Test.

Section 6 – Warranties

The Sensus USA contract contains warranty provisions to deal with quality issues that are not detected through the acceptance cycle. The warranty provisions protect EWEB from premature or catastrophic failures of equipment. Two primary warranties exist, as follows:

- All metering and networking equipment is covered by a 15 year, declining warranty. If failure rates exceed 1% average in any given 12 month period, the warranty will kick in and cover EWEB cost to replace the meters (both equipment costs plus $35 for labor). The first 3 years of the warranty period, 100% of costs are covered by Sensus. Years 4-10 are covered 67% Sensus, 33% to EWEB. In year 11- 15, Sensus will reimburse 33% of costs.

- A system warranty is also in place that describes Sensus responsibility to ensure that once the system attains the performance criteria set forth in the Final Acceptance Test, Sensus will be responsible for 100% of costs to return to those acceptance criteria if problems arise in the first year of system operation.

Section 7 – Scope Management

In spite of the project size and complexity, project planning expects that scope changes that might occur should be minimal in scope and cost impact. Reflecting that assumption, the Sensus contract contains provisions for small scopes changes, not to exceed $250,000, to be approved by project

management at both EWEB and Sensus, without contract amendment.

Any scope changes exceeding that amount would be address as budget and contract amendments per Board Policy for major capital projects.

Section 8 – Waste disposal

The project specifications account for appropriately disposing of 142,000 old meters and related equipment that result from this project. Recycling is a high value item and EWEB has contracted to receive bill credits for recycled meter parts.

Section 9 – Staff Impacts

The efforts of the project will result in the displacement of jobs in several areas in the utility. New positions are expected to absorb some of these jobs, although the net result is an anticipated reduction of positions, as summarized below:

Net adds	**Addnl Work (HRS)**	**Approx FTE impact**	**Notes**
Information Technology	860	1/2 FTE	Business Analyst
AMI operations	4450	2 FTE	Lead, Network
		2.5	**Adds**
Net subtractions			
Meter Reading	33650	16 FTE	
Connect/Disconnect (Field)	7000	3 FTE	
Back office operations	2600	1.25 FTE	
		20.25	**Reductions**
		17.75	**Net FTE impact**

Section 10 – Business case assessment of project value

The AMI Business Case was presented to the EWEB Board in April 2012 and three alternatives were presented and compared to our current operations:

Alternative	Description	Total Benefits
1	Basic AMI for Electric only	$6 million NPV
2	Basic AMI for both Electric & Water	$12 million NPV
3	AMI for Electric & Water plus advanced AMI options	$20 million NPV

Note that all amounts in this section are discounted to net present value (NPV).

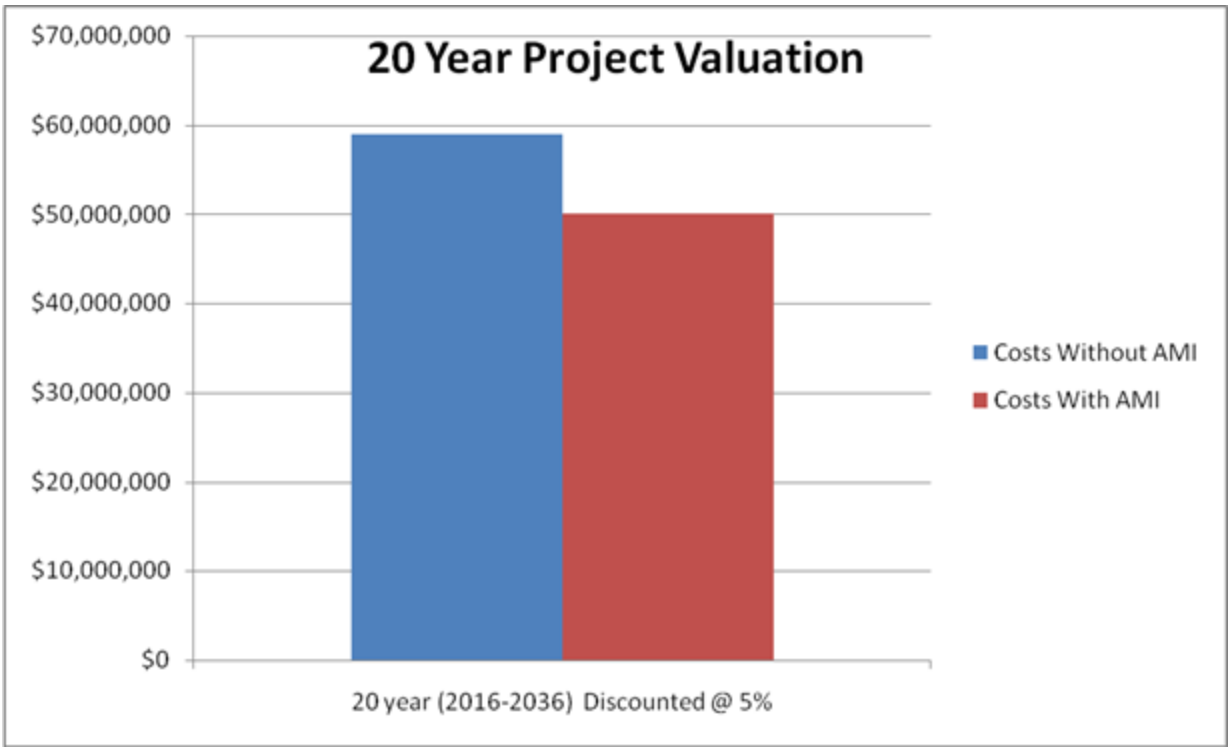
For the 2013 AMI Case, staff reviewed and updated Alternative 2 to reflect cost changes and a revised deployment schedule. The updated result remains at $12 million NPV. Staff did not re-evaluate Alternative 1 (electric only) as it is not a viable option. Staff also did not re-evaluate Alternative 3 as there is no new information for the advanced AMI options, but since Alternative 2 remained similar, staff expects Alternative 3 to remain similar as well.

Staff did focus on introducing variations between Alternative 2 and 3 that more closely reflect how staff has modified their thinking on project approaches. Three new key variables were assessed to determine how they impacted the overall business case as they related to operational benefits shown in Alternative 2:

1. Staff evaluated the potential removal of the upriver service territory.
2. Staff evaluated moving a 2012 Alternative 3 investment (Meter Data Management) to earlier in the project.
3. Staff requested Sensus to provide a more robust network coverage model than originally proposed. This involved adding to upriver meter communications, which may or may not come to pass (see item 1).

These variations can swing the operational benefits from a low of $9 million NPV to a high of $13 million NPV. Because the outcome of the variations is unknown, staff used the most conservative view of $9 million NPV in benefits for the cost projections presented in the Long Term Financial Plan presented to the Board of Commissioners on July 16, 2013. The $9 million NPV benefit analysis includes the upriver service district and Meter Data Management.

Note that the 20-year benefit with AMI of $9 million NPV is based solely on operational benefits as presented in 2012 Alternative 2, and excludes resource benefits contained in 2012 Alternative 3.



Other – Specific questions from Commissioners, with answers

Q - I'd like to hear more about the replacement cycle of the sensus meters. There has been some public concern that analog meters last 40 years and digital meters only have a 10-12 year working life. This ties in to the general experience we all have with lots of modern appliances, toys, etc. They are cheaply made and don't last the way things from the 50s did. So this is the default assumption for lots of people unless we address it. I hope you'll discuss the life cycle of digital meters and compare it to the best of what's available on the market these days in terms of durability.

A – Looking at EWEB statistics, it is fair to say that newer, digital meters do not last as long as older mechanical meters. Commissioners should note EWEB has been deploying digital, not mechanical, meters for about a decade now , as the supply of mechanical meters in North America is limited to after-market refurbished meters or grey market meters that do not meet US safety and accuracy standards. The statistics are based on current meters used at EWEB, which do not include meters manufactured by Sensus. Currently, our primary meter is from Elster, with some Itron meters. We have used GE, L+G and others in the past. The most common problem with newer, digital meters are not so much in the metering as they are in the LED display faces, which fade out and fail, particular on southern exposures.

The LEDs are crucial in a manual meter reading system such as we have today. They may not be as crucial in an AMI world where readings are transmitted electronically and it may take months or years to discover the LED read-out has faded. Independent consultants from RW Beck/SAIC advised that this is an industry-wide challenge, not particular only to Sensus or any other single manufacturer. Continuing improvements in digital metering are expecting in newer generations of meters.

To address future quality issues, EWEB sought diversity in meter suppliers. With the Sensus system, we have our choice of Sensus, L+G, Elster and GE meters. These 4 represent 4 of the top 5 manufacturers in this space. Each will be tested and evaluated. We also anticipate having a 3rd party (UL) test the meters.

EWEB staff recognized early on that constantly replacing poorly manufactured meters could erode the business savings of the project. To insulate from that, EWEB required bidders to provide a 15 year warranty that reimbursed EWEB if meter failures exceeded 1% in any given year (rolling 12 month average). We believe this creates the greatest financial incentive for the manufacturer to delivery durable equipment up front and protects our investment in this technology.

As a result, the business case assumes a 15 year replacement cycle for meters, along with a 1% per year premature failure rate.

It is also important to understand that the relative cost and value of both power and water compared to meter costs has grown. This means that the importance of meter accuracy has grown and EWEB has already adopted shorter meter change out cycles even before AMI . This is true for both the water and electric utilities.

Q - To what extent does AMI represent a transfer of funds from billing dept. to IT dept?

As shown in Section 9 (above), virtually all of the labor efficiencies gained come in the Customer Services area, which include Meter Reading, Connect/Disconnect (Field Services) and various back office billing function. As noted elsewhere, the cost reductions for these functions falls within $1.5m-$2.0m per year.

The corresponding growth in core IT functions is not anticipated to be substantial in comparison, approximately ½ FTE of additional business analyst time. The additional computing infrastructure related to AMI (servers, etc.) represents a tiny increase to the existing fleet of IT equipment and is not anticipated to require incremental increases in staffing.

Commissioners should note that an entirely new function called AMI operations would materialize with an AMI system and require ~2 FTE to operate on a continuous basis (based on observations of other utilities of similar size using Sensus AMI). Along with AMI system maintenance cost of ~$50,000 per year, the new section would absorb ~$250,000/yr in savings gained from the Customer Services area. This function may or may not ultimately be viewed as IT.

In addition, the business case forecasted periodic projects (every 5 years) where additional resources would be needed for 6-9 months to conduct major system upgrades and replace underlying IT equipment (servers, disk, etc.). The every-five-years projects are anticipated to cost $300,000-$500,000 per occurrence and could be viewed as a cost shift from Customer Services to IT.

Q – Do we know if the water meters will work with our many water meters that are submerged for parts or all of the year?

EWEB had a very specific technical requirement in the RFP to address this concern, shown below:

Explanatory Statement: Nearly 100% of EWEB's water meters are installed in outside, below grade meter pits. Proposers should take into account that water meters can be continuously submerged during all or part of the year.

Sensus Response: The SmartPoint does not require any alternative equipment in order for it to perform as designed in a pit set environment that is subject to submerged situations. The plastic housing incorporates a tamper resistant, waterproof connection technology. The electronics of the transmitter are hermetically sealed in a High Density Polyethylene (HDPE) enclosure that is waterproof and provides an operating temperature range of –30°F to 165° F. (–34°C to 74°C) The pit set SmartPoint transmitter may be completely submerged in water 24 hours a day, 7 days a week, for the life of the product without any internal damage or malfunction and without impacting the battery or electronics. The SmartPoint antenna is located in the top housing of the application and is not affected if the meter is fully submerged under water. In addition, the connection between the meter and the SmartPoint is also not affected when the meter is fully submerged.

Staff Response: We plan to test this as part of our field tests. Additionally, it is important to point out that water meters that are read with a promixity wand rely on a similar wire-based tie between the meter register and the surface pad. These have operated successfully for many years in submerged environments.

Recommendation

Based upon this background memo and the presentation scheduled for August 6th, identify an additional information or analysis that is required for consideration of the AMI project in October.

Requested Board Action

See recommendation above.