Advanced Metering Program

Branndon Kelley, Chief Information Officer
AMP’s R&D Effort for AMI

- **AMP has a successful history of leading collaborative projects in response to Member needs**
  - Solving complex technical problems involving technology

- **In 2012, AMP Member interest in smart grid resulted in the formation of AMP’s Smart Grid Advisory Committee (SGAC).**

- **In response to SGAC interest in AMI, AMP hired Leidos Engineering to explore business opportunities**
  - Recommendation: With sufficient scale, AMP could provide economies of scale from bulk purchasing of field components and share the cost and complexity of AMI back office system requirements

- **The SGAC recommended that an “Owner’s Engineer & Project Manager” be identified to lead a program development effort**
  - AMP selected Quick Solutions, who placed a 30-year industry veteran with 10 years’ smart grid experience in the role
AMP’s R&D Effort for AMI

• *The program development effort was comprised of three separate phases - Member Outreach, RFI and RFP*
  
  – Member Outreach Phase identified eleven AMP wishing to collaborate
  
  – RFI was issued to 23 vendors to provide a thorough review of market offerings. Thirteen vendors were selected for demonstrations, each lasting from 2 – 6 hours. SGAC members attended in person or via WebEx
  
  – Nine vendors were selected as RFP recipients – Eaton/Cooper Power Systems, ElectSolve, Elster, L+G, Leidos Engineering, Sensus, Silver Spring Networks, Tantalus, and Utilismart

• *A comparative analysis was performed, evaluating the nine respondents across multiple dimensions, including price*

• *AMP selected Silver Spring Networks and ElectSolve Technology Solutions & Services as partners for its AMI Program*
AMP’s AMI Vendor/Partners

Silver Spring Networks

ElectSolve Technology Solutions & Services, Inc.

CentraVU™ Customer Energy Portal

**uCentra™ Integration Solutions**
The complexity of AMI Systems....

Back Office Infrastructure:
- Outage viewer
- Customer Portal
- Utility Portal
- MDM

AMI Head-End

Field Infrastructure:
- Collectors
- Meters
- Back Haul

Integration Layer

Utility Owned – Traditional “On-Premise”

Billing System
Common Hurdles Municipalities Face

- Limited ability to explore the AMI marketplace & build a business case
  - Resource constraints prevent thorough review of potential vendors
  - Retaining external consultants is often required

- Managing relationships with a new group of vendors
  - Reliance on vendors/distributors to interact with municipality’s leadership
  - Distributors help with this, but only with the vendors they represent
  - Varying degrees of project management maturity among vendor/distributor

- AMI Deployments with “on-premise” technology
  - Specialized employees for the deployment & support of IT systems
  - Staff may be difficult to attract and retain for municipalities
  - Consumes capital budgets on technology investments

- Vendor-hosted solutions
  - Expertise deferred to vendors; impacted by industry consolidation
  - Rigid, inflexible application suite

- Unplanned future expenses & loss of economies of scale
Lessons learned from independent action...

AMP Members with existing AMI systems openly shared their perspectives with the Smart Grid Advisory Committee:

- Some AMI projects fail to meet expectations – poor scoping at the onset leaves some deployments with “swivel chair operations”
- Inadequate readiness of municipality with respect to billing system capabilities and asset data
- Lack of vendor project management causes scope creep and delays in project completion
- Deficiency of local expertise causes long term challenges to operations
- Shortcomings with analytics from AMI-collected data

*AMP’s AMI Program solves these issues, drives down the risk of failure and increases the likelihood of project success.*
AMP AMI Program Description

• Enables municipalities to acquire Advanced Metering Infrastructure (AMI) equipment and services under contracts AMP has in place with its Vendors.

• The Program includes an operating model and associated roles and responsibilities for the deployment, operation and maintenance of all the components necessary for a fully functional AMI system.
  
  – **Initial Services (one-time investment).** AMP oversees the deployment of advanced meters, AMI Communications network components, and integrations to the municipality’s business systems to enable meter-to-cash processes. Additional integrations to other operational system are provided as required.

  – **Ongoing Services (annual operating expense).** All necessary AMI applications, systems, and related technologies (applications, servers and related infrastructure) and the Silver Spring Networks AMI network management application will be deployed by AMP and provided to the Municipality as “Ongoing Services”.

• AMP executes a Member Schedule to the Master Services Agreement in place with the Municipality to enable participation in the Program.

• All AMI software and hardware, along with network monitoring and head-end operations, are provided by AMP as Ongoing Services for an initial period of 10 years, with an annual escalation cap of 3%.
AMP AMI Program –
Initial Services (one-time costs)

• Member IT Infrastructure Review & Preparation
• AMP Back Office Setup & Software Deployment
• AMI Deployment Project
  o Field Equipment
  o Network Infrastructure Equipment
  o Network Infrastructure Tools
  o Network Installation
  o Integrated Electric Meters
  o Electric Meter Installation
  o Water Meter Modules
  o Water Meter Module Installation
  o Water Network Infrastructure Tools
  o Silver Spring Networks Services
  o Applications & Integrations
  o Base Billing System Integration,
    Training, & ElectSolve Services
  o Optional Interfaces, Configurations &
    Application Modules
  o AMP Project Management
AMP AMI Program –  
Ongoing Services (annual operating expense)

• AMP provides ongoing support for the Member’s AMI deployment and provides a descriptive operating model as part of the agreement.

• AMP is fully accountable for end-to-end performance of the AMI system.

• Silver Spring Networks’ Network Operation Center (NOC) monitors each Member’s access points and relays for connectivity. Should problems arise with any of the deployed AMI communications equipment, or connectivity between the devices and the NOC, the NOC personnel connect the Member directly and initiate restorative processes.

• ElectSolve’s support team is the first point of contact for Member issues with AMI data flowing into its business systems. Any issues related to connectivity between the AMI head-end and the deployed software is jointly resolved by SSN, ETSS and AMP IT.
Early Successes –
First Deployment Complete; two underway

• **First Deployment**
  – Meter-to-cash is complete
  – Billing customers with AMI-collected data since September, 2017
  – Currently deploying “optional” integrations & applications for SCADA, GIS and integration to JAA metering
  – Benefits Realized
    • Early estimates suggest that meter replacement has generated **2.3% improvement** in billed energy due to improvements in meter losses
      – 2016 3-month average of rolling 12-month average of Purchased Power to Power Consumption was 6.5%
      – July – September, 2017 was 4.2%

• **Next two deployments are AMR to AMI conversions**
  – Retaining most existing water meters; replacing water meter modules
  – Replacing all electric meters and deploying AMI & supporting systems
AMP’s First Deployment

- Savings to date attributed to meter replacement
- Additional “hard dollar” energy savings expected from reduction in distribution voltages
AMP Value Proposition

• **Fully managed AMI-Headend and Meter Data Management System**
  - Fully managed primary and Disaster Recovery site
  - Annual Disaster Recover and failover testing
  - Integrates to member CIS system.
    - Ongoing support of CIS integration included
  - Includes Utility Portal for operations
  - Support for additional modules (customer web portal)

• **Advanced Cybersecurity, Intrusion Prevention, Data Encryption and monitoring of all systems.**

• **Member AMI Communications Network Monitored by SSN’s Network Operations Center – 24x7x365**
  - Vendor Service Level Agreement provides 99.5% read reliability for electric meters
    & 99% read reliability for water meters

• **Future system and software upgrades**
AMP Value Proposition

- **Single accountability for AMI system deliverable & performance**
  - ✓ From initial project management through initial 10-year contract
- **No meter vendor lock-in**
  - ✓ Silver Spring Networks supports multiple meter manufacturers
- **Economies of scale from collaborative procurement**
  - ✓ Bulk pricing on field components
- **Financing options**
  - ✓ $20 million allocation of AMP’s line-of-credit available
- **Support for AMI deployment**
  - ✓ project management
  - ✓ customer outreach
  - ✓ presentations to municipality’s leadership
- **Sharing of IT labor & resources – attract/retain/compensate staff**
AMP’s Hosted Solutions – Future Opportunities?

• **Billing System**: Municipalities are finding the “billing module” of their municipal software inadequate for modern billing requirements
  – Rates: Net metering, time-of-use, seasonal, power factor penalties...
  – Customer Options: Prepaid usage, web access, etc.
    ✓ Municipalities are deploying separate billing systems
    ✓ Creates additional IT complexity

• **Customer Web Access & Prepaid Usage**: Adding both introduces additional complexity and dilutes accountability for system performance
  ✓ Desire for single accountability
  ✓ Eliminate multiple applications, “swivel chair” user interface

• **Supporting customer services**: Most municipalities are outsourcing low value functions (bill print & mailing, remittance processing, after hours call handing)
  ✓ Opportunities to lower cost from Joint Action
Closing thoughts
QUESTIONS?