VOICES
of Experience
Leveraging AMI Networks and Data

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Voices of Experience Initiative

Objective

• Create a valuable resource for utilities
• Provide an educational foundation and neutral perspective for other industry stakeholders (e.g., commissions, legislatures, consumer advocates, etc.)

Overview

• Started in 2011
• Found there is value in sharing experience and lessons learned
• Information collected through conversations
• Preserves the “voice” of the participants
• High-level insights and advice – not a technical report

Underlying Goals

1. Capture industry insights and experience
2. Provide a forum to exchange ideas and learn from colleagues
Voices Series

Focus on areas that pose operational challenges or are critical to industry transformation.

Share knowledge to further enhance grid modernization efforts.

Capturing the Collective Voice and Experience of Utilities at the Forefront on Modernization Efforts
Voices of Experience

Document Structure

- Skimmable
- Conversational
- Stand-alone chapters
- Document Elements
  - What utilities are learning
  - What utilities are doing
  - Lessons learned
  - Biggest Challenges
  - Examples
  - Insights
  - Advice
  - Additional Resources
Working Group
- Over 120 participants
- Represent Co-op, Munis, and IOUs

Data Gathering
- Regional meetings
- One-on-one interviews
- Topic calls/webinars

Questions Explored
- What value is AMI providing beyond its original business case?
- How are utilities using the data to achieve value?
- How is AMI data helping improve operations?
- How are customers benefiting?
Why focus on AMI?

• Original business case: cost savings from avoided truck rolls
• Recovery Act jumpstarted installations (deploying 16,322,970 meters)
• Goal of DOE funding:
  1. Prove value and benefits
  2. Gain confidence and experience with the technology
• Experience shows value exceeds expectations
• Voices effort captures the value utilities are unlocking
Key Takeaways

• AMI is an evolution.
• It does more than billing and rates
• It’s a catalyst for new customer relationships
• Full-scale deployment and integration with other systems increases the value
• It enables utilities to be proactive rather than reactive
• It’s worth the cost

“The AMI world is a blast right now, and the opportunities are large.”

Bryce Johanneck
Cass County Electric Cooperative
Meter ping functionality
- Helps identify nested outages
- Can differentiate between a customer or utility issue

Integrating AMI with OMS
- Alerts utility there is an outage before the customer calls
- Improves restorations by helping pinpoint outage location so crews dispatched quicker and the trip is shorter.

Remote Connect/Disconnect
- Convenience and costs savings were unanticipated
- Improves worker safety
- Connections/reconnection can happen in minutes or hours vs. days

Voltage Data
- Data tells a story about how the grid is operating
- Reveals what crew knew intuitively
- Unlock value hidden in the data to increase efficiencies
• Learn to trust the data
• Foster curiosity and provide access to data across the enterprise
• Encourage collaboration across groups; different groups bring different insights
• Prioritize good ideas; ideas will come faster than can be implemented
• Create applications to visualize the data and make it actionable for operators
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AMI for Operations
What Utilities are Doing

• **Florida Power & Light Company:** Developed iOMS, a tool-based artificial intelligence ticket processing robot that eliminates non-value added truck rolls. 96% accurate, runs 24/7, resolves tickets 8X faster.

• **KCPL/Westar Energy:** Piloted a predictive failure effort for transformers. Allows them to reduce unanticipated transformer failures, better plan replacements, reduce outage times, and decrease overtime costs.

• **Holy Cross Energy:** Overlays AMI voltage data in GIS so can see voltages in context of overall system helping to improve efficiencies, identify and resolve issues that wouldn’t have know about before.

• **Austin Energy:** Feeds AMI interval data into ADMS to create load profiles and obtain better load flow estimates

• **PEPCO:** Uses AMI to proactively identify any DER that might cause a secondary voltage rise

• **SCE:** Piloting the use of AMI data to proactively shift or reduce EV charging load

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Planned transformer replacement costs are 25% lower than unplanned replacements

*Florida Power & Light*

In 2015, processed 4.5 million service orders remotely with 98.56% success rate = 96% reduction in reported injuries

*Oncor*
### Customer Benefits

- Increased convenience
- Improved power quality
- More information and control
- Reduced fees and costs
- Customer safety
- Faster restoration times
- Increased reliability

### New Products and Services

- Online portals
- Proactive notifications and alerts
- New rate programs
- Customer-initiated meter pings
- Remote connection of service
- Demand response programs (BYOT)
- Customized Solutions
- Targeted Communications

### Insights

- Call times might go up as volume goes down
- Partner with vendors; many benefits to co-branding
- Access to energy use not enough; proactive alerts and messages add more value
- Pairing AMI data with other data can enable new solutions that provide added convenience and target products to customer who will benefit from them
**ComEd:** Developed an app that lets customers ping their own meter. Customers use the feature ~1,500 times per month. App also allows for bill payment, reporting and tracking outages, controlling thermostat, and see bill projections.

**Oncor:** Created a 24/7 notification platform that sends proactive messages to customers, includes an estimated time of restoration and notifies customers when power is restored. Estimated to have saved ~325,000 calls.

**Avangrid:** Created customized solutions using customer segmentation models based on AMI data and third-party research.

**PG&E:** Evaluated the impact of TOU rates for every customer prior to rolling out the new rates helping to ensure new rates wouldn’t adversely impact one customer class.

**SCE:** Partnered with thermostat companies to co-brand and co-market their BYOT DR program. Partners control the load for their customers. Reductions verified and measured using hourly AMI reads.

**SMUD:** Developed three bill alert options – bill threshold, mid-bill alert, high bill alert – so customers can pay attention when they need to. ~10% of customers have signed up.
• Data is a valuable asset

• Important to establish data governance and assign ownership

• It’s not necessary to start with a big analytics program – start small and expand

• Don’t put the data in tools. An agnostic data layer makes it more accessible and eliminates inefficiencies

• Pair someone who understands the data with someone who knows the business

• Finding hidden failures or patterns requires advanced analytics and pairing AMI with new data sources (e.g., weather data, lightning strikes, etc.)

• Look outside the utility industry at nontraditional disciplines for data scientists
Looking to the Future
What Utilities are Considering
• Evaluating shorter data intervals and bringing back additional data types (e.g., frequency)
• More sophisticated analytics and AI
• Analytics at the edge (making calculations and adjustments at the meter)

Specific Use Cases
• Use customer segmentation and analytics to better understand load forecasts (e.g., reductions) based on demographics and house size (SMUD)
• Collect one-minute voltage data from sample of bellwether meters for VVO as part of ADMS upgrade (Austin Energy)
• Leverage network to communicate with smart inverters (CA IOUs)
• Create regulation zones by harnessing smart inverters and batteries for voltage regulation. (PEPCO)
• Collect frequency data to report reliability metrics (Westar/KCPL Energy)
• Phase identification (SDGE)