Leveraging MDM and Smart Metering at PGE

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Today’s Topics

• Company Overview
• History of Smart Metering & MDM Development
• Status of Current Smart Metering Project
• Leveraging Meter Data & Smart Metering Infrastructure Today
• Smart Grid Roadmap
Portland General Electric

- Oregon’s Largest Utility
  - Headquartered in Portland, OR
  - 803,000 electricity customers
  - Serving 52 cities over 4,000 sq. miles

- 2009 J.D. Powers
  - 1st in Western Region in customer satisfaction, power quality and reliability
  - 2nd in Western Region in customer service and corporate citizenship

- Recent Awards
  - “10 Years of Excellence Award” in Meter Data Management (Metering International - 2009)
  - “Best Practices Award” for Advanced Metering & Data Management (Chartwell - 2008)
MDM & Smart Metering History

• Decade of Accomplishment
  • Oregon approves Direct Access 1998
  • PGE approves “network metering” strategy 1999
  • SmartSynch implemented for portfolio rates 2001
  • MDM (Meter Data Consolidator) goes live 2001
  • Hunt TS1 system placed in Mt. Hood area 2001
  • Tests of Hunt TS2 and Elster 2003-2005
  • AMI RFP issued 2006
  • Business and IT requirements planning begins 2006
  • Sensus signs contract as system-wide AMI vendor 2007
  • Core business process work begins 2007
  • AMI tariff approved 2008
  • System Acceptance Testing (SAT) 2008-2009
  • Full deployment begins April 2009
Current Smart Metering Project

• Timeline
  • Meter deployment  April 2009 – August 2010
  • Tower deployment  July 2008 – December 2009
  • Initial route rollovers  September 2009
  • Project completion  December 2010

• Sensus FlexNet™ Two-Way Wireless System
  • 43 towers; 44 tower gateway basestations (TGBs)
  • WAN – both microwave and fiber (56kb IP-based connection)
  • 835,000 meters using Sensus and Elster meters

• System Stats
  • Sized for 1.2 million meters with hourly or 15-minute data
  • 3 years of billing meter data (7 terabytes) online plus 4 years “near-line” meter data (9 terabytes) stored in the MDM
  • 13 mos. of statistical meter data online in data warehouse
Current Project Status

• **Meter Deployment**
  • 200,000 meters installed to date

• **Tower Deployment**
  • 30 of 43 towers commissioned

• **Host System**
  • Installation & testing of host system software completed
  • Initiation of rollover to network reads end of September
  • 15-minute and 60-minute interval data to be collected

• **Network Communications**
  • ≈ 98% of meters communicating daily (those “on network”)
  • Ongoing work to fine-tune network during build-out
Leveraging Smart Metering Today

Business Process Work to Derive Benefits

- **Automated Meter Exchange**: Automating business processes to support meter exchange during mass deployment
- **Connects**: Leveraging remote disconnect capability (non-owner occupied residential) by automating payment extension, energy assistance, and lack of contract & credit disconnect service orders
- **Lost Revenue Protection**: Proactively identifying energy loss by analyzing interval usage data
- **Customer Selected Due Date**: Providing customers with choice of bill due dates by selecting preferred cycle date
- **On-Cycle Billing**: Ensuring accurate, timely billing with AMI system; automating move-in/move-out and adjustment processes
Leveraging Smart Metering Today

Business Process Work to Derive Benefits (con’t)

- **Routine Meter Exchange**: Automating work orders for new installs, routine MX and troubleshooting, and processing GIS data
- **CIS Work Orders**: Automating work orders from CIS to metermen in the field; reporting job status to internal end-users
- **Information Driven Energy Savings (IDES)**: Implementation of web-based tool to provide energy usage information to customers
- **Interval Data Usage**: Data warehouse to store and maintain interval data; supports multiple uses and analyses, including IDES, load research, daily forecasting, demand response, distribution asset management & outage management
Leveraging Smart Metering Today

Prioritizing Benefit Capture

Automated Meter Exchange
Connects (remote disconnect)
Lost Revenue Protection
Customer Selected Due Date
On-Cycle Billing
Routine Meter Exchange
CIS Work Orders
Information Driven Energy Savings
Interval Data Usage

$8.1
$4.1
$3.6
$1.8
$0.6
$0.0
$0.0
$0.0

$18.2 million per year in projected O&M savings
PGE’s Smart Grid Roadmap

A 2010-2014 Roadmap

Using Smart Metering Tools and Technologies to Change the Way We Do Business
PGE’s Smart Grid Roadmap

DOE Smart Grid Investment Grant Program

• Seeking $76 million for PGE’s $172 million Smart Grid Initiative through 2014

• Focus is on leveraging smart metering and modernizing electric distribution & delivery systems through investments in technology

• Goal is to augment the enterprise with new, time-responsive architecture and data-centric systems

• New tools & technology will change more than 100 business processes, mostly through automation of information flows and processes not previously automated
PGE’s Smart Grid Roadmap

Smart Metering

• Interval Data from All Meters
  • Robust data for load research & planning
  • Increase customers’ understanding of energy use
  • Enable demand response, TOU and CPP programs
  • Provide customers with online energy usage data and analysis based on customers’ own usage profile

• Two-Way Communications & Control
  • Improve customer service & responsiveness
  • Troubleshoot problems and upgrade metrology over the air
  • Data source for OMS and other enterprise systems
Plans for Future Smart Grid

Sense & Respond: Real-Time DP Architecture

• Greater functionality in processing and responding to data inputs from the field

• Monitor real-time & interval data feeds from multiple sources:
  • Smart meters, weather reports, wholesale market prices, distribution equipment, etc.

• Implement pattern recognition system to identify and assess outages, possible power theft, distribution asset performance, etc.

• Generate alerts and propose possible solutions based on pre-defined thresholds or patterns

• Automate work order creation & processing
Secure Energy Network: Cyber Security for T&D

- Cyber security mechanism to secure information critical to control, continuity and reliability of grid
  - Duplicate system that preserves a secure network separate from corporate LAN
  - Add logical DMZ networks into PGE’s existing energy network
- Common internal approach to management & control of cyber assets
- System for detection & prevention of cyber security threats
  - Network Intrusion Detection System (NIDS)
PGE’s Smart Grid Roadmap

Distribution Automation: Leveraging Smart Grid Data

• Upgrade systems to enable smart grid functionality based on smart metering and SCADA
• Replace and/or upgrade GIS and OMS with “smart grid ready” technology
  • Accurately associate smart meter end-points and T&D assets with customers and events
  • Integrate smart metering system data with OMS to improve outage response and restoration capabilities
  • Implement Mobile Workforce Management (MWM) system tied to OMS
• Lessen dependence on customer input to isolate problems and improve response times with near real-time data
Conclusion

• PGE is on a path to reassert itself as a customer-focused, efficient and responsive utility using smart metering and smart grid-enabling technologies

• Our decade of experience with automated metering and advanced meter data management is the foundation upon which we are building

• Our smart metering project, coupled with the Smart Grid Initiative, will completely change the technology that supports our business practices – from energy delivery to metering to billing to customer service

• Our goal is not just automation and operational savings, but to improve the customer experience
Contact

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