AMI Overview

Don Perio
Manager - Meter Reading & Operations

Entergy
Louisiana, USA
Outline

• Who is Entergy?
• Why AMI?
• AMI Pilot Development & Process
• AMI Technology Selection
  • Network Overview
  • Demand Response
• Q&A
2.7 million customers
  - 2.5 million electric
  - 200,000 gas

Four state coverage:
  - Arkansas
  - Louisiana
  - Mississippi
  - Texas
Entergy Footprint

- Operating system
  - 15,500 miles of high voltage transmission
  - 1,550 transmission substations
- Annual revenue exceeds $11 Billion
- 14,300 employees
- We are both an urban AND rural utility
Why AMI?
Industry issues

- Energy price increases, price volatility
- Supply disruptions
- Increased demand
- Transmission, distribution, and generation resources dated
- Peak demand control
- Environmental issues
- Corporate citizenship
- Continuous customer service evolution
- Labor pressures
Increasing electricity demand

Billion kiloWatthours

Historical

Projected

Electric companies must demonstrate a controlled use of resources to all stakeholders.

Entergy’s footprint has a much larger natural gas component.

Source: U.S. Department of Energy, Energy Information Administration (EIA), 2005 preliminary data

* “Other” includes generation by agricultural waste, batteries, chemicals, geothermal, hydrogen, landfill gas recovery, municipal solid waste, non-wood waste, pitch, purchased steam, solar, sulfur, wind, and wood.
The Value Proposition of AMI

Entergy’s external customers and constituents
  • Corporate Citizenship
    • “The next power plant”
  • Customer Service and power reliability

Entergy’s internal customers
  • Enhanced forecasting
  • Accurate meter reading and billing
  • Reduced line loss
  • Reduced energy theft
  • Proactive line maintenance
  • Improved collections and credit
AMI Development and Process
The AMI Team

Executive Sponsor
Pat Waters – Director Business Services Utility Operations

Project Owner
Don Perio, Manager Meter Reading & Operations

Core Team

Team Leader/Proj. Mgr. Jim Green

- CSCs & Credit & Collections
- Supply Chain
- Distribution Operations
- Meter Standards
- System Regulatory
- AMI Vendor
- IT
- Demand Response
- Customer Service
- System Planning
- LA State Regulatory
- Transmission
Setting AMI strategy and objectives
Regulatory Process...

- In August, 2007 Louisiana PSC issued rules for advanced metering and demand response
- Established requirements for rate recovery
- Encouraged utility involvement in advanced metering and demand response
- For deployment, the utility had to make application to LPSC
- Entergy filed application September, 2007
- Application approved October, 2007
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Entergy’s AMI critical functional pilot objectives

Primary Functionality

• Full two-way network connectivity
• Daily and on-demand meter reads
• Remote disconnect/reconnect
• Outage management
• Theft detection

Monthly gas meter reading

Demand response

• Time of use
• Energy information
• Load control
  • Programmable thermostats for A/C control
  • Wireless devices (water heaters, pool pumps, etc.)
Selection criteria for pilot area

- The selected location must provide a test base for targeted functionality

- Accessibility to key external and internal stakeholders
  - PSC
  - Key Entergy stakeholders
Selection criteria for pilot area

Baton Rouge, Louisiana
Meets all criteria

- Six meter reading routes
- Near Louisiana State University campus
  - High potential for connects/disconnects
  - High potential for re-reads
  - Availability of company personnel to install meters
- Gas customer base
- Regulatory support
Technology and vendor selection criteria

- Ability to meet functionality
- Ability to meet schedule
- Cost
- Vendor viability and proven
- Intangibles
Technology Selection

AMI Mesh Network
The Value Proposition of a mesh network for Entergy

• Controlled installation and maintenance costs
  • Plug & Play installation
  • The meter population is the mesh network

• Proven two-way AMI technology mesh network
  • Largest mesh network provider in the world
  • +1.3MM smart meters deployed globally

• Dynamic and controlled mesh network
  • Self Healing
  • Secure
  • Self registering

• Standards based open system for future growth
**Mesh Network**

**Auto-registration**

1. Collector meter looks for unregistered nodes

2. Collector checks for reliability and registers Level 1 nodes

Nodes can be either polyphase or single phase meters

Collector is a single phase or polyphase meter with WAN & LAN boards
Auto-registration

1. Collector looks for unregistered nodes
2. Collector registers Level 1 nodes
3. Collector registers Level 2 nodes & repeaters
4. Collector registers Level 3 nodes & repeaters

5. Network continues to build out to a max of 8 hops (7 repeater levels) or until maximum collector setting
Demand Response Solution

- Implement June 2008
- Key Objectives
  - Time of use
  - Demand Response
  - Energy Information
- Thermostat displays dynamic energy usage information (MTD charges, event indicators)
Project Score Card

- % Successful auto meter reads
  - Monthly
  - Daily

- On demand meter reads (re-reads and virtual on/off)
  - Number during pilot
  - % successful

- Remote connects/disconnects
  - Number during pilot
  - % successful
Project Score Card

- Estimated reads, implausibles, cancel rebills
  - Number during pilot
  - Baseline number in pilot area, prior to pilot

- Use on accounts that are virtual turn offs (read and left on)
  - Number of virtual turn offs during pilot
  - Number of accounts with use during virtual off period
  - Average use per day during virtual off period
Project status

- Distributed RFP – Q3/2007
- Went “Live” March 2008
- Evaluating technology, process and formulating business case
- Provide long term strategy recommendation to all stakeholders.
Thank you!

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