

Florida Power & Light Company

Energy Smart Florida

Abstract

The Florida Power & Light (FPL) project is deploying advanced metering infrastructure (AMI), distribution automation, new electricity pricing programs, and advanced monitoring equipment for the transmission system. AMI supports two-way communication between FPL and its 3 million consumers receiving smart meters associated with the DOE grant, providing detailed information about electricity usage and the ability to implement new electricity pricing programs. New distribution automation devices expand the functionality of FPL's distribution system to increase reliability, reduce energy losses, and reduce operations and maintenance costs. Synchrophasor and line monitoring devices help increase the reliability and security of the transmission system.

Smart Grid Features

Communications infrastructure includes a 900-MHz wireless mesh network for two-way communication between smart meters and access points on the grid. Various public and private communication networks are used between access points and FPL's advanced metering infrastructure head-end systems. Distribution automation devices use the same communication networks as AMI. FPL's smart meters include 2.4-GHz radios which support ZigBee®-based communications with future in-home energy management devices.

Advanced metering infrastructure includes 3 million smart meters provided for FPL's customers. AMI supports automated meter reading, enhanced outage response and notification, and improved theft-of-service detection. With more detailed and timely data on peak electricity usage, FPL can improve its load research, analysis, and forecasting capabilities, enabling the utility to more accurately plan possible capacity expansion and capital investments in the future.

Advanced electricity service options include FPL's In-Home Technology Pilot, which tests emerging in-home technologies in the homes of 500 volunteer customers and assesses whether a proposed new critical peak pricing incentive (subject to approval by the Florida Public Service Commission) is effective in helping customers change their energy habits. The free, voluntary pilot

At-A-Glance

Recipient: Florida Power & Light Company

State: Florida

NERC Region: Reliability Coordinating Council

Total Budget: \$578,963,325

Federal Share: \$200,000,000

Project Type: Advanced Metering Infrastructure and
Customer Systems
Electric Distribution Systems
Electric Transmission Systems

Equipment

- 3 Million Smart Meters
- 250 Home Area Networks
- 250 In-Home Displays
- Distribution Automation Equipment for 129 of 3,124 Circuits
 - Automated Distribution Circuit Switches
 - Automated Capacitors
 - Automated Voltage Regulators
- Equipment Condition Monitors 45 Phasor Measurement Units
- 60 Distributed Energy Resources Interface
- Transmission Line Monitoring System

Time-Based Rate Program

- Critical Peak Pricing

Advanced Transmission Applications

- Angle and Frequency Monitoring
- Post-Mortem Analysis
- Wide-Area Monitoring
- Voltage Stability Monitoring
- Improved State Estimation
- Event Detection
- Disturbance Analysis

Key Targeted Benefits

- Reduce Electricity Costs for Customers
- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Equipment Failures and Theft
- Reduced Greenhouse Gas Emissions
- Reduced Truck Fleet Fuel Usage

Florida Power & Light Company *(continued)*

includes 250 in-home displays and 250 home area networks, which include home energy controllers. One segment of home area network participants (10 customers) also receive smart appliances, including washers, dryers, dishwashers, hot water heaters, and refrigerators.

Time-based rate programs include a pilot implementation of critical peak pricing.

Distribution automation systems include the installation of 230 automated feeder switches, capacitor automation equipment, voltage regulator automation equipment, and transformer condition sensors. These improvements enhance distribution system reliability, reduce outage restoration time, improve circuit voltage regulation, and improve the operational efficiency of the distribution system.

A wide-area monitoring system, using synchrophasor technologies, provides FPL with improved real-time information on the operation and reliability of the transmission system. This delivers greater visibility into system performance and accelerates system restoration.

Timeline

Key Milestones	Target Dates
AMI infrastructure installation begins	Q3 2009
Distribution intelligence installation begins	Q2 2010
Transmission intelligence installation begins	Q2 2010
In-home technology pilot begins	Q1 2011
Enterprise-wide predictive and diagnostic centers upgrade begins	Q1 2011
Enterprise-wide predictive and diagnostic centers upgrade complete	Q1 2012
Distribution intelligence installation complete	Q1 2012
AMI infrastructure installation complete	Q2 2012
Transmission intelligence installation complete	Q2 2012
In-home technology pilot complete	Q4 2012

Contact Information

Bob Triana
ESF Operations Manager
Florida Power & Light Company
bob.a.triana@fpl.com

Recipient Team Project Website: www.fpl.com/energysmart