

Pepco Holdings, Inc.-DC

Smart Grid Project

Abstract

The Pepco Holdings, Inc.-DC (Pepco) Smart Grid project in Washington, DC, includes distribution automation, advanced metering infrastructure (AMI), and demand response programs that involve load control devices and time-based rate programs. The AMI installation is designed to provide customers and Pepco with detailed electricity usage information, which, when combined with the demand response programs, helps customers reduce electricity usage and peak demand. The distribution automation deployment includes automated distribution circuit switches and transformer monitors that improve the reliability of the distribution system while decreasing operations and maintenance costs.

Smart Grid Features

Communications infrastructure involves components of the wireless AMI mesh network. The system has the capability to route traffic through the AMI meters, and Pepco is designing the system to route distribution automation traffic through battery-backed wireless communications devices. This approach ensures that distribution automation traffic remains on energized communications devices during power outages. The system uses the same backhaul communications systems to transport AMI and distribution automation data to the appropriate end points.

Advanced metering infrastructure includes the installation of 270,000 smart meters across Pepco's entire Washington, DC service territory. These meters can be used by Pepco to detect power outages and provide notification. AMI supports demand response, load control, and time-based rate programs, and reduces the cost of meter operations.

Advanced electricity service options offered through the project include a Web portal for electric customers to access their consumption data and programmable communicating thermostats. The Web portal allows customers to view the data collected from their smart meters, giving them information on the amount and timing of their electricity usage, and the costs. The Web portal also provides the platform for customers to view and control the programmable communicating thermostats.

At-A-Glance

Recipient: Pepco Holdings, Inc.

State: Washington, DC

NERC Region: ReliabilityFirst Corporation

Total Budget: \$89,161,098

Federal Share: \$44,580,549

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

Equipment

- 270,000 Smart Meters
- AMI Communication Systems
 - Meter Communications Network
 - Backhaul Communications
- Meter Data Management System
- Customer Web Portal
- Customer Systems Communications Network
- 20,000 Customer System Devices
 - Programmable Communicating Thermostats
 - Direct Load Control Devices
- Distribution Automation Equipment for 19 out of 781 Circuits
 - Distribution Automation Communications Network
 - SCADA Communications Network
 - Automated Distribution Circuit Switches
 - Equipment Condition Monitors

Time-Based Rate Programs

- Time of Use
- Critical Peak Pricing
- Peak-Time Rebate

Key Targeted Benefits

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

Pepco Holdings, Inc.-DC (continued)

Direct load control devices deployed by the project allow Pepco to cycle off certain electric equipment during peak demand periods in the summer months. In addition to helping Pepco manage overall system demand, load control also helps customers manage their electricity costs.

Time-based rate programs include customer options to enroll in time-of-use pricing, critical peak pricing, and critical peak rebate programs. These programs provide incentives for customers to shift their consumption to off-peak periods and potentially reduce electric bills.

Distribution automation systems include automated switches, controllers, smart sensors, and substation electronic relays connected to the distribution system, allowing for continuous visibility and remote control of the system. These devices, comprised of automatic sectionalizing and restoration, work together to identify faults, automatically isolate identified problem areas on the distribution system, reconfigure the controlled feeders, and reduce the frequency and duration of outages for customers. Distribution automation includes installation of network transformer protector monitors, which provide real-time transformer status information such as phase currents, transformer loadings, and power factors. The project also includes installation of on-line dissolved gas analysis monitors on substation transformers. These devices monitor fault gases and other key parameters for timely assessments of transformer conditions.

Timeline

Key Milestones	Target Dates
AMI installation start	Q3 2010
Distribution automation installation start	Q2 2010
Direct load control devices	Q1 2013
AMI installation complete	Q1 2012
Distribution automation installation complete	Q4 2013

Contact Information

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