

NSTAR Electric & Gas Corporation Urban Grid Monitoring and Renewables Integration

Project Description

NSTAR will enhance grid monitoring instrumentation on one of its secondary area network grids in downtown Boston, MA using state-of-the-art sensor equipment to monitor current and conductor temperature. This project will monitor grid-points in 500 manholes with a layered instrumentation approach. The manholes designated "minor nodes" (250) will have sensors that detect high and low current, voltage and cable temperature threshold values on individual secondary-main cables within the grid-point. These nodes will have an automated meter reading-type radio transmitter for drive-by data collection. The "major nodes" manholes (250) will be instrumented with technology to provide current sensing on a real time basis and be equipped with power line carrier technology to allow near real-time monitoring at the operations center. Advanced metering infrastructure-capable meters will be deployed at customer locations on the grid where solar photovoltaics (PV) are located and will monitor consumption. In two substations, the remote terminal units will be upgraded to include programmable logic controllers (PLCs) to store network feeder information, continuously analyze data, and take actions when necessary. Information from the sensors, smart meters, and SCADA data will be sent to a repository for analysis.

Goals/Objectives

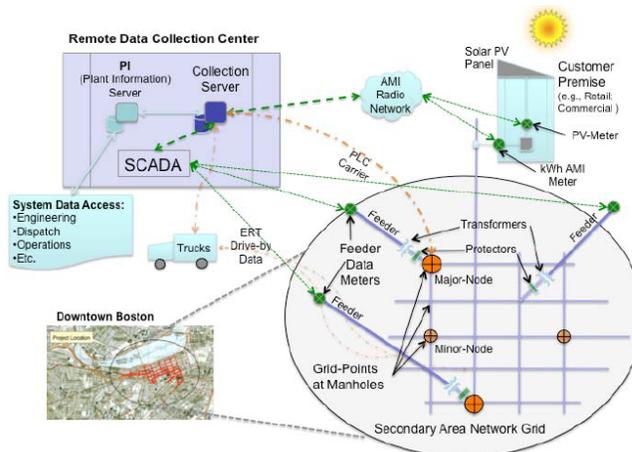
- Demonstrate a new technique for integrating inverter-based distributed generation (DG) (e.g., solar PV) with a secondary area network grid
- Demonstrate the viability of the project's "minor node" monitoring approach
- **Demonstrate Proposed IEEE1547.6 standard's viability for inverter based DG**

Key Milestones

- Minor Node Sensor Manufacturing (2011)
- Major & Minor Node Sensor Installation Completed (2012)
- Commissioning Completed (2012)

Benefits

- Greatly improved knowledge of the urban grid's status in near real-time allowing proactive maintenance leading to improved safety & reliability
- **Possibly enable DG integration with secondary area network grids**



CONTACTS

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PARTNERS

DigitalGrid, Inc
SoftStuf, Inc

PROJECT DURATION

02/01/2010–01/31/2014

BUDGET

Total Project Value
\$10,535,184

DOE/Non-DOE Share
\$5,267,592/\$5,267,592

EQUIPMENT

Major & Minor Node Sensors
Enhanced Substation SCADA (PLCs)

DEMONSTRATION STATES

Massachusetts
CID: OE0000293

Managed by the National Energy Technology Laboratory for the Office of Electricity Delivery and Energy Reliability

