

Reducing Peak Demand to Defer Power Plant Construction in Oklahoma

Located in the heart of “Tornado Alley,” Oklahoma Gas & Electric Company’s (OG&E) electric grid faces significant challenges from severe weather, hot summers, and about 2% annual load growth. To better control costs and manage electric reliability under these conditions, OG&E is pursuing demand response strategies made possible by implementation of smart grid technologies, tools, and techniques from 2010-2012. The objective is to engage customers in lowering peak demand using smart technologies in homes and businesses and to achieve greater efficiencies on the distribution system. The immediate goal: To defer two 165 MW power plants currently planned for construction in 2015 and 2016.

Partially funded with \$130 million in Recovery Act funds awarded by the U.S. Department of Energy (DOE), OG&E is implementing a \$293 million Smart Grid Investment Grant (SGIG) project to install smart meters to all customers and automated switches, circuits, and capacitor banks to cover about 40% of the distribution lines going to homes and businesses. OG&E aims to maintain competitive rates and believes the smart grid project plays a critical role: “We are proud of the partnership we have with our customers to help keep costs lower which benefits all of us,” said Ken Grant, Managing Director of OG&E’s Smart Grid program.



OG&E smart meter installation

An important feature of the project involves a two-year study of lowering peak demand in which time-based rates (i.e., time-of-use with critical peak pricing and variable peak with critical peak pricing) are randomly assigned to about 6,000 residential and commercial customers who volunteer to participate. To help in their demand response to these pricing programs, participants also are assigned various combinations of information and control technologies, including in-home displays, programmable communicating thermostats, and access to a web portal (<http://www.myOGEPower.com/>). The study measures demand reductions by customers during peak periods and the relative contributions from the technologies and pricing plans.

Phase 1 of the study involved about 3,000 participants and was conducted during the summer of 2010. Findings indicate general enthusiasm about the new rates and technologies. For example, drop-out rates were low and about 98% of the customers saved money on their bills. The findings also show most of the customers were able to reduce their use of electricity during peak periods. For example, on August 4, 2010, which was the OG&E system’s peak day, on-peak reductions for residential customers in the study ranged from 13% to 40% below baseline levels. The reductions varied by the types of pricing plans and technologies being used. To verify these results, OG&E expanded participation by an additional 3,000 customers for Phase 2 of the study during the summer of 2011.



In-home display

If shown to be cost-effective, OG&E plans system-wide expansion of a demand response program. “I cannot think of a more important initiative in our industry today than to partner with our customers to

reduce peak energy use and gain other efficiencies using the smart grid platform,” said Pete Delaney, chairman and CEO, OG&E Energy Corp.

OG&E is one of eight SGIG recipients working with DOE to design and conduct statistically rigorous customer studies to assess acceptance of time-based pricing programs and information and control technologies and their impacts on peak demand.

Learn More

The American Recovery and Reinvestment Act of 2009 (Recovery Act) provided DOE with \$4.5 billion to fund projects that modernize the Nation’s energy infrastructure and enhance energy independence. For more information about the status of other Recovery Act projects and how DOE is working with recipients to conduct consumer behavior studies, visit www.smartgrid.gov. To learn about DOE’s Office of Electricity Delivery and Energy Reliability’s national efforts to modernize the electric grid, visit www.oe.energy.gov.



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