

Outsmarting Storms in Chattanooga

CHALLENGE

Tennessee is located in the leeward track of “Tornado Alley” in the U.S. Midwest, an area prone to extreme storms. In Chattanooga, the traditional electric infrastructure is decentralized, with 115 small substations serving 600 square miles. Over the past 4-6 years, increasingly frequent and labor-intensive storm-related outages routinely impacted as many as 50-75 percent of customers served by the Electric Power Board of Chattanooga (EPB), costing the community up to \$100 million each year.

SOLUTION

Through a DOE Smart Grid Investment Grant, EPB secured funding to accelerate the modernization of their power infrastructure, including:

- a fiber optic network as the primary means of communication for all smart grid equipment,
- an advanced metering infrastructure system that included the deployment of approximately 175,000 smart meters,
- an energy management web portal, and
- distribution automation equipment for nearly all of EPB’s customers

The project also delivered time-based rate programs to customers to create incentives for peak load reductions. With the architecture fully upgraded, Oak Ridge National Laboratory is now partnering with EPB to test new smart grid technologies such as advanced controls and microgrids. Under this partnership, Chattanooga’s smart grid becomes a “living laboratory”, with ORNL applying data analytics, control systems, cybersecurity, and high-performance computer modeling expertise.

IMPACT

The new partnership is reducing peak loads, overall electricity use, and operations and maintenance costs. Estimated savings in just one year include:

- \$1.6 million in operational costs through automated meter reading
- \$40,000 by eliminating the need to manually operate switches
- \$40 million for business and homeowners through a 40 percent reduction in outage minutes, and
- \$2 million in wholesale demand through voltage controls.

Contact

Tom King, Oak Ridge National Laboratory
kingtj@ornl.gov or 865.241.5756



An EPB technician deploys a smart meter at a Chattanooga residence.

In November 2014 the U.S. Department of Energy launched the GMLC, a strategic partnership between DOE and the national laboratories to bring together leading experts and resources to collaborate on national grid modernization goals.

This integrated effort builds on prior individual projects at the national laboratories to deliver grid-related advancements, such as **Chattanooga’s modernized power grid.**