

Helping America’s Electric Cooperatives Build a Smarter Grid to Streamline Operations and Improve Service

Electric cooperatives play an important role in the U.S. energy infrastructure, delivering electricity to 44 million consumers across over 70% of the geography of the country every day. Implementing smart grid technology is seen by co-ops as a cost-effective way to improve reliability, streamline the restoration of electricity following outages and improve customer service. At the National Rural Electric Cooperative Association (NRECA), an Arlington, VA-based organization that provides services to more than 900 not-for-profit electric cooperatives nationwide, work is underway to study the impacts of smart grid technologies that will reach more than 700,000 consumers in 12 states.

Funded partially with \$33.9 million in Recovery Act stimulus funds awarded by the U.S. Department of Energy (DOE), the NRECA project involves the deployment of smart meters, devices that automate distribution circuits and communications and data management infrastructure. The new equipment will help NRECA’s co-op members analyze system conditions faster and speed up restoration times following outages. In rural areas where distances between customers are often great, reducing the number of trips to consumers’ homes and businesses can have a significant impact on cost and efficiency. Consumers, meanwhile, will be able to better manage their consumption and take advantage of such services as pre-pay billing and remote connection and disconnection.

The value of the demonstration project lies in the solutions that NRECA’s Cooperative Research Network (CRN) is developing to meet the unique service challenges of electric co-ops, including how to cost-effectively deploy and operate smart technology particularly in areas that are remote, have comparatively low density, or are located in areas prone to natural disasters such as hurricanes, tornadoes and ice storms. NRECA is tackling the challenge across multiple fronts by helping co-ops manage the large amounts of new data produced by smart technologies, implement these technologies in a way that is secure, extend and improve interoperability to fulfill the vision of a smarter grid and create a communications infrastructure that can handle the requirements of a smarter grid.

During the project’s first year, NRECA has carefully planned for deployment of communications and meter data management systems prior to the procurement of other components in order to ensure compatibility and interoperability. “Preparation is essential because smart grid systems generate tens of thousands more bits of information than conventional systems,” says Craig Miller, project manager at NRECA. “Without efficient communications and data handling systems, project participants would have to manage a huge increase in the volume of data and could find themselves facing costly engineering solutions just at the point when the equipment needs to be working and performing.” NRECA’s administrative and technical management support includes central procurement of more than 250,000 pieces of equipment necessary to conduct the research. As a result, the co-ops in the project can take advantage of economies of scale and will utilize a centralized system to track equipment purchases and installation. Nearly all of the smart grid components are expected to be on order by the end of the year.

At the same time, NRECA is helping the co-ops implement cyber security best practices in a practical and systematic way. NRECA’s “Guide to Developing a Cyber Security and Risk Management Plan”, which was developed as part of the project, provides a step-by-step risk mitigation checklist and a comprehensive map of distribution-level smart grid interfaces. The best practices and standards included in the guide are based on the 600-page survey of smart grid standards and security considerations developed by the National Institute of Standards and Technology.

The results of the research effort are expected to show major benefits from the implementation of smart grid technology. “We expect to need additional power plants and transmission in our region sometime during the next five years,” says Mark Stallons, President and CEO of Owen Electric Cooperative in Owenton, KY. “These upgrades should help delay those decisions by reducing demand.”

Learn More

The Recovery Act (American Recovery and Reinvestment Act of 2009) 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 the other Recovery Act projects, visit smartgrid.gov. To learn about DOE’s Office of Electricity Delivery and Energy Reliability’s national efforts to modernize the electric grid, visit oe.energy.gov.



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