

Talquin Electric Cooperative, Inc.

Smart Grid Program

Scope of Work

Talquin Electric Cooperative, Inc.'s (TECI's) Smart Grid program involved the installation of advanced metering, communications infrastructure, distribution automation equipment, and customer systems. The project implemented two-way communication that enables customers to view their energy consumption at their convenience through customer systems and web portals.

Objectives

A key project goal was to provide the cooperative with the foundation for rapidly evolving grid technologies. The project also aimed to enhance the reliability and quality of electricity delivery, provide information and tools to improve outage management, and reduce operations and maintenance costs. In addition, the project introduced customer communication measures aimed at reducing overall electricity use and increasing customer satisfaction.

Deployed Smart Grid Technologies

- **Communications infrastructure:** The project deployed a microwave backhaul system that has enabled wireless two-way communication between the meters and the central control office. Meter communications now include a wireless radio frequency (RF) network that utilizes a spectrum licensed by the Federal Communications Commission. This scalable infrastructure has provided opportunities to add future service offerings and functionality to optimize energy delivery, system reliability, and customer participation.
- **Advanced metering infrastructure (AMI):** TECI installed 54,945 smart meters, providing AMI coverage for all customers. New AMI features such as outage and restoration notification and remote service switches have enabled TECI to respond to outages and customer requests more efficiently. The AMI deployment supports other electric service options, such as future prepay programs.
- **Advanced electricity service options:** TECI has provided a web portal that provides customers with two-way information exchange so that they can access account balance and electricity usage information at their convenience. Over 30 percent of customers are already using this portal. The project also involved a pilot installation of programmable communicating thermostats for 1,000 customers. The thermostats allowed customers to better manage their

At-A-Glance

Recipient: Talquin Electric Cooperative, Inc.

State: Florida

NERC Region: SERC Reliability Corporation

Total Project Cost: \$16,200,000

Total Federal Share: \$8,100,000

Project Type: Advanced Metering Infrastructure
Customer Systems
Wireless Communications Systems

Equipment

- 54,945 Smart Meters
- AMI Communications Systems
 - Wireless RF Meter Communications Network
 - Microwave Backhaul Communications
- Customer Web Portal
- 1,000 Programmable Communicating Thermostats
- Distribution Automation Equipment for 15% of Existing Circuits*
 - SCADA Communications Network
 - Automated Capacitors

* This distribution automation equipment will affect 23 substations and 46 circuits within TEC's service territory.

Key Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Improved Electric Service Reliability
- Reduced Electricity Costs for Customers
- Reduced Costs from Distribution Line Losses, Equipment Failures, and Theft
- Deferred Investment in Distribution Capacity Expansion
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Pollutant Emissions

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central air conditioning and heating equipment. This information feedback system gave customers greater control over their electricity costs and bills.

- **Distribution automation systems:** Centrally controlled capacitor banks have been installed throughout the TECI service territory. The distribution automation upgrades allowed TECI to adjust the electric distribution power factor by adding or removing kilovolt-amperes reactive (kVARs) from the system as load increases or decreases across the distribution network. This system leverages the AMI RF network, allowing TECI to perform VAR adjustments based on data from a supervisory control and data acquisition (SCADA) platform.

Benefits Realized

- **More efficient billing process:** AMI meter installation has reduced the time gap from customer usage to TECI billings by 30 days. Issues with reading accuracy and collectible accounts have also been reduced significantly. Write-offs from uncollected electric services have been reduced by 71% over the lifetime of this project.
- **Fewer truck rolls:** The biggest financial impact has been a significant cost reduction as a result of fewer truck rolls—around 25,000 truck rolls saved, resulting in savings of ~\$1.8 million over the last five years. Since TECI is a rural cooperative with low customer density, the average cost of a truck roll is \$74, which is high compared to that of many other utilities.
- **Reduced operating and maintenance costs:** Meters have supported other efficiency improvements in operations and maintenance activities. For example, AMI meter features include remote service switching, which saves trips into the field to connect or disconnect service, and electricity theft can be identified less expensively than before. Overall, operations and maintenance costs have decreased by approximately \$400,000—a 25% reduction—over the last five years.
- **Improved power quality:** The new distribution automation equipment has helped improve power quality, reduce line losses, and reduce operations and maintenance costs.

Lessons Learned

- The lines between engineering and information technology (IT) are starting to blur in the utility world, so the IT department must be involved in smart grid projects early and in depth. TECI's analysts understood databases and networks well and were engaged in the beginning, making progress much easier.
- Vendors should be involved early so that integration goes more smoothly.
- A meter data management system is essential to maximize the use of assets and AMI data.
- Educating cooperative members was very important. Employees must also be educated and involved so they can answer questions from members.

Future Plans

One of the primary goals in developing the TECI smart grid was to “future-proof” Talquin, allowing for rapidly developing smart grid requirements. TECI feels that an adequate platform for future smart grid needs has been established.

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