

AMERICA'S FASTEST FIBER-ENABLED SMART GRID

CASE STUDY

"The broadband communications network will enable EPB's electric system to be intelligent, interactive & self-healing – helping us provide our customers with the at-home tools and resources that will allow them to manage their energy use, increase power quality and much more." David Wade, Executive Vice President & COO



CHALLENGE

While many utilities struggle with the question of whether or not to build a Smart Grid, for EPB it was never an issue. The big question for Chattanooga's municipal utility was how to make its investment pay off in far greater ways than simply automating meter readings. EPB sought a solution that not only benefited the utility, but delivered ever-growing value to the community by improving quality of life and opening up economic opportunities. It took ten years for EPB to formulate its plans. It took ten years for technology to catch up to its vision. But the city's decision to simultaneously deploy the country's most powerful fiber optic network and a Smart Grid system set a new standard for how a utility can lead the way toward a bright economic future while improving power quality, reliability, customer service and energy efficiency.

SOLUTION

EPB is one of the first community-owned utilities to install a 100% fiber optic network. It is also one of the first to deploy a Tantalus Homerun™ Network, which leverages the city's broadband network for Smart Grid applications in addition to triple-play media services – high speed Internet, video and telephone – which the utility offers. This high bandwidth platform gives EPB lightning fast, two-way communication with every device in its distribution system. While a network this robust is overkill for metering, EPB realized that fiber is essential for tightly coordinated load shedding activities and for the split second responsiveness required in distribution automation. With virtually limitless data capacity, EPB's network will not become congested as millions of smart meters and smart appliances join the network, and as data intensive communications with these devices becomes more frequent.

RESULTS

Fiber will touch every home and business in Chattanooga by the end of 2012. As well, all 170,000 homes and businesses served by EPB will be equipped with a Tantalus smart meter. Although building the network is the first step, the Smart Grid, not triple play, drove the business case. It was clear this technology was the key to managing energy costs and environmental impacts well into the future. The Dept. of Energy also saw the benefits and awarded EPB a stimulus grant so it could fast track the project. Fiber is paying off by attracting new business, like Volkswagen's new North American manufacturing headquarters. The city will also be a test bed for Electric Vehicles, with Tantalus providing the means through which 300 street-side charging stations can be closely monitored. During peak conditions, EPB can avoid overloading transformers by defer charging until the evening. On the other hand, Tantalus can be used to measure how much power is being withdrawn from EV batteries if EPB needs to access energy stored in car batteries. While discussion about the Smart Grid centers around how homeowners can better manage consumption and cost, EPB sees local industries as having the most to gain. Access to reliable, low cost power is essential. When time-of-use prices are in effect, manufacturers can reschedule or resequence operations to periods when energy is the cheapest. Furthermore, the ability to optimize power quality benefits the manufacturing process by minimizing the impact caused by minor fluctuations in voltage or frequency, which once disrupted manufacturing equipment.

EPB BRIEF

- Chattanooga, Tennessee
- 170,000 residential and business customers / 600 square mile service area
- Largest DOE ARRA stimulus grant recipient for municipal utility; \$111.5 m to accelerate project; largest grant amount per capita.
- 1 Gigabit Internet offering to both residential and business customers; fastest in the U.S.
- Tennessee Valley Authority distributor

ADVANTAGES

- Homerun™ Network leverages Fiber to the Home for triple play media and Tantalus Smart Grid
- Fiber Optic network supports upload and download speeds 200 times faster than the current national average, and 10 times faster than the FCC's National Broadband Plan (a decade ahead of schedule)
- Fast, low cost deployment - 1500 smart meters per week; self-configuring, self-healing Tantalus network streamlines smart meter implementation and subsequent upgrades
- Helps industrial customers become more energy efficient; TOU pricing expected to result in savings of \$2.3 m a year for 22 manufacturers involved in time-of-use rate pilot
- Anticipates 40% in outage reductions resulting from improved distribution system management and intelligent switch technology
- Easy scalability; Tantalus can support communications with the millions of data points expected to be on the network by 2012 including meters, demand response devices (smart thermostats & load control devices), distribution equipment and smart appliances
- Interface with EPB's Meter Data Management System via MultiSpeak