

Programs, Not Projects

By Lisa V. Wood, executive director, Institute for Electric Efficiency

During the smart grid's visionary days, when discussion was plenty and results were scarce, a central question echoing in utility boardrooms and commission hearings was, "Why is it so important to modernize our grid?" So, utilities developed several demonstrations and pilots to test advanced systems and meters. These demonstrations have formed the backbone of the 21st century electric distribution system.

Today, we have moved from a handful of innovator companies to widespread and successful industry focus on smart-grid projects. The next questions are, "What have these efforts taught us, and where is the power sector headed in the 21st century?" Many electric utilities are providing answers, and the results are both encouraging and instructive.

AEP Ohio is one example. It has demonstrated that when information technology software is applied to electric technology hardware, large system efficiencies develop in novel ways. AEP Ohio's 150-square-mile GridSmart Ohio demonstration area, which contains 110,000 smart meters just northeast of Columbus, provides one head-to-toe vision of the next generation energy distribution system—smart meters, smart rates, enhanced outage management and power restoration, distributed storage, and integrated voltage control.

Actions Speak

For the residential customer living in greater Columbus, smart meters are the most visible and talked-about piece of the new energy system; and through the smart meter AEP Ohio is enhancing the quality of and expanding the possibilities for electricity delivery services in several ways.

New billing services and nontraditional (that is, peak-sensitive) rate structures make use of the smart meter's real-time data streams, empowering the customer to be an active participant in energy management.

The integration of data streams to and from smart meters transforms the customer-utility relationship and revolutionizes operations management systems. With the smart meter data, AEP Ohio improves its outage-management re-

sponses by overlaying meter on/off status information with geographic information systems—this streamlines field-crew restoration efforts and reduces the utility's carbon footprint by cutting down on truck rolls. When the lights do go out, they don't stay out for long.

In two neighborhoods, AEP has installed 80 25-kilowatt backup batteries—community energy storage (CES) systems—to provide immediate service restoration when an outage occurs. The CES system operates with such a high degree of precision that most households will not even realize that an outage is occurring in the larger distribution system. The batteries provide up to five hours of backup power, but that should be enough: In general, informing a household that it is on battery power and exercising automated load-curtailment agreements will keep the lights on for the CES neighborhood while the utility works to restore power. The cumulative effect of having 2 megawatts of backup power is that AEP Ohio can provide a remarkable energy service to its customers. Imagine—300 homes can

be partially or totally unaffected when an outage occurs.

While the meters at home boost the information technology IQ at the end point, AEP Ohio also recognized the potential efficiency gains in the system's midsection. Distribution lines deliver electricity within a regulated voltage band; and the utility can real-

With smart meter data, AEP Ohio improves its outage-management responses and streamlines field-crew restoration efforts.

ize tremendous energy consumption and demand reductions by sending power in the lower half of the band. AEP Ohio showed a 2-3 percent drop in energy consumption and demand with its integrated volt VAR control (IVVC) demonstration system on 17 circuits. Using this across the whole system would result in huge efficiency gains.

Against the backdrop of increasing energy-efficiency resource standards in half of U.S. states, including Ohio, IVVC has proven to be one of the most promising smart grid programs for delivering benefits to customers and meeting energy-efficiency targets.

Results Count

At one point, we will have to stop treating smart grid "projects" as trial runs. They are programs—and the smart grid programs at AEP Ohio, for example, are showing results. The lessons we take from them are helping the industry and regulators define and understand the transformation of electric power in the 21st century. ♦



Courtesy: AEP

ELECTRIC PERSPECTIVES

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